

R E P O R T
OF THE
EXPLOSION AT THE WELWOOD MINE
OF THE
NEW RIVER AND POCONONTAS CONSOLIDATED COAL COMPANY
AT
WELWOOD, FAYETTE COUNTY, WEST VIRGINIA

August 6, 1919

By
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Pittsburgh, Pa., November 1, 1919.

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INTRODUCTION

BRIEF STATEMENT:

About nine o'clock on the night of August 6, 1919, an explosion occurred in the Weirwood Mine of the New River and Pocohontas Consolidated Coal Company, Weirwood, Fayette County, West Virginia, in which seven men lost their lives.

LOCATION:

The Weirwood mine is located on the Virginian Railway about one quarter of a mile south of Pax, Fayette County, West Virginia.

OPERATORS:

The New River and Pocohontas Consolidated Coal Company is a corporation having its main offices in Charleston, West Virginia. The Company is closely affiliated with the Berwind-White interests of Philadelphia, Pennsylvania. Mr. John E. Berwind of New York is the President, Mr. H. M. Sertolet of Charleston, West Virginia, General Manager, Mr. A. F. Marshall Superintendent of the Weirwood Mine, and Mr. Fred Miller

Mine Foreman at Sax, Fayette County, West Virginia. The Berwind-White Company of Philadelphia, Pennsylvania, is the selling agent.

SEAM OF COAL MINED:

The Company is mining the Sewall seam of coal, which averages about three and one half to four feet in thickness, and bears the trade name of "New River" coal.

The coal dips toward the Northwest at an average grade of three per cent, and has no distinct cleat. At the bottom of the shaft the coal is at an elevation of 1312 feet (Sandy Hook datum).

At the Weirwood mine the coal is full of faults, many of the entries running for quite a distance thru rock, the thickness of the coal being almost negligible.

The Company has put down a number of drill holes and indications point to the fact that further development in a southerly direction will prove a more uniform thickness of coal. The south entries are now being driven directly toward the Eccles Mine of the New River Collieries Company.

The best coal has been found in the southerly side of the mine, from which section two samples of coal were taken. Sample No. 32598 was taken from the rib at the intersection of 3rd Left and Main South Entries, the section at that point being as follows:

	Ft.	In.
Black Slate	1	0
Draw Slate	0	6
Coal	1	7
Bone and Slate	0	7
Coal	2	0

Sample No. 32599 was taken from the rib at the intersection

of 2nd left and main south entries. Following is a section:

	Ft.	In.
Black Slate		
Draw Slate	2	3
Coal	1	7½
Slate	0	2
Coal	1	11

Sample No. 32600 is a composite of the two above samples.

The floor of the mine is of hard slate. In a number of places the roof has fallen to a height of eight or nine feet.

DEVELOPMENT:

The mine is opened by a shaft 343 feet in depth.

VENTILATION:

The mine is ventilated by a Robinson Fan driven by a chain drive from a fifty horse power motor. The fan is operated as an exhaust and was delivering about 71,000 cu. ft. of air at the intake against a water gage of nine-tenths of an inch.

There are five main splits, from the returns of four of which air samples and air measurements were taken, the analyses sheets of which are attached to this report.

For a distance of several hundred feet from the shaft, the four entry system has been developed. Owing probably to the frequent faults which occur in the coal, and the heavy expense of driving these entries, the main south and main east entries have been driven on the double entry system. From the main entries, one entry and an air course are driven, rooms being turned only from the entry. In nearly all cases the intake air passes up the aircourse and returns through the parallel entry and rooms.

Several pairs of entries are ventilated on one split. This system of ventilation necessitates the use of several doors for each pair of entries. The stoppings of all entries are made of stone, plastered with mortar.

DRAINAGE:

In general the mine is wet, over a million gallons of water being pumped every twenty four hours. The pumping equipment consists of two centrifugal pumps having a capacity of a thousand gallons per minute and six small pumps to deliver the water to the larger ones.

HAULAGE:

Electric motor haulage is used throughout the mine, the Company owning five motors. The coal is gathered by smaller gathering locomotives and hauled to the partings where heavier motors take the trips to the bottom of the main hoisting shaft. All motors are operated from a 250 volt circuit.

The track in the entries is laid with fifty pound rails resting on hardwood ties averaging six inches square, while in all rooms thirty and fifteen pound rails are used.

Single end-gate mine cars are used, having a capacity of 3500 pounds and an empty weight of 2000 pounds. There are in use at the present time about one hundred and forty five cars.

As far as could be observed the end-gates were tight and but little coal was spilled on the haulage ways.

HOISTING EQUIPMENT:

As has been stated, the shaft is three hundred and forty-three feet in depth; it is equipped with self dumping cages, built by the

Connellsville Foundry and Machine Company, Connellsville, Pennsylvania.

The coal is hoisted by an electric hoist made by the Allis Chalmers Company, Milwaukee, Wisconsin. The tippie is of steel and equipped with a storage bin having a capacity of 100 tons.

The tippie has a daily capacity of 2000 tons; at present, however, the average daily output is about 200 tons. Eighty men are employed underground and fifteen men above.

LIGHTING:

The main entries are lighted near the shaft bottom by electric incandescent lamps at 250 volts. All miners lights are of the Edison storage battery type and the mine foreman and fire-boss carry flame safety lamps for the purpose of testing for gas. It is the impression of the writer that these lamps are opened by a key. If this is the case, it would seem advisable that magnetically locked safety lamps be substituted. A recent explosion, in which a number of men lost their lives, was undoubtedly caused by the mine foreman, a man who held certificates from three states, opening his key safety lamp and trying to relight it with matches.

MINING METHODS:

In general the mine is worked on the pillar and room system, altho the many faults which occur in the coal necessitate more or less modifications. For possibly six or seven hundred feet from the bottom of the shaft, the four entry system has been started, but where the south and east mains branch off, only two entries are driven; from these mains pairs of

entries are turned both to the right and to the left at intervals of about three hundred and fifty feet. Rooms from twenty five to thirty feet in width are turned from one entry, the other parallel entry being used simply as an air course. The room pillars and chain pillars are thirty five feet in width, the entries being driven fourteen feet wide. All the coal is taken out in advance work as no ribs or pillars have been removed.

The coal is undercut by electric machines, one Jeffrey and two Goodman Shortwall machines being in use.

In each room are three lines of props spaced about three feet apart, the props in each line being staggered with the corresponding prop in the parallel row.

EXPLOSIVES:

After being undercut the coal is shot down with Monobel No. 2 detonated by Dupont No. 6 detonators, and the writer was informed that two tons of coal was obtained per pound of explosive.

For brushing roof Monobel No. 1 is used. The maximum amount of explosive which each man is allowed to carry at any one time into the mine is five pounds, and is generally kept in a wooden box near the face. The maximum size drill hole is $1\frac{1}{2}$ " and the maximum charge is three sticks, which is tamped with clay sent from outside, an ordinary mine trolley wire being used as a tamping bar. There are five shot firers who do all the shooting, using an electric battery for the purpose of igniting the charge. There is no particular time for shooting, each working place being shot when it is ready.

There have been no blown out shots nor has an explosion at this mine ever occurred before.

DUST CONDITIONS:

Generally speaking the mine is damp, and in many places several inches of water may be found in the entries. On the east side of the mine, however, especially in 7th right, the mine is dry and dust to the depth of several inches was found in the rooms and on the roadway.

The superintendent informed the writer that all dusty places were sprinkled whenever necessary by a sprinkling car.

POWER PLANT:

Practically all the power is purchased from the Central Plant of the Virginia Power Company, Cabin Creek-Jet, West Virginia. It is delivered over a high tension line to the power house. There it is transformed by motor generator sets to the voltage used in the mines. Located in the power house are one double and one single 300 KW motor generator set. There is also one 100 H.P. boiler for generating the steam used in and around the plant.

COAL PREPARATION:

All the coal is shipped run of mine, consequently there is no screen equipment. Two trimmers are employed on the cars, who pick the slate and other impurities as the coal is loaded. There are two loading tracks having a capacity of forty-five cars. The coal is all shipped over the Virginian Railway.

STORY OF EXPLOSION

About nine o'clock on the evening of August 6, 1919, an explosion occurred in No. 11 room on Seven Right Entry on the east side of the Weirwood Mine of the New River and Pocahontas Consolidated Coal Company in which the following named men were killed:

Ben Jones, colored, miner 35
Willie Jones, colored, miner 28
Mike Pittner, white, miner 32
Henry Painter, white, miner 34
Leroy Lowry, white, motorman 32
Angelo Rugger, white, gathering motor brakeman 34
Charles Buckland, white, shot firer. 39-

Two men who were cutting coal in No. 1 room off No. 2 room felt the explosion, but were not knocked down. They ran out and found the door between No. 2 and No. 3 room out and the door between No. 7 Right and the aircourse partly open. They met the night foreman on the main entry about six hundred feet from the shaft bottom. They reported the trouble to him, and then went to the shaft and were hoisted to the surface.

The night foreman went up Seven Right and found the door between No. Seven Right and the aircourse opened about thirty inches and wedged with a piece of post. He then went into Seven Right Entry and found it full of smoke.

Returning down the Main Entry he started for the outside but met the Superintendent and four men at No. 6 Right. The party proceeded up Seventh Right aircourse and found the stopping at the first breakthru almost intact, a small part of the top being blown off. The second stopping was about half gone and all the remaining ones completely destroyed. The door

between Main East and Seventh Left was found uninjured. The door on Seventh Right between No. 2 and 3 Rooms was blown down as was the door between Eighth Left Entry and the Main East.

The first body, that of Ben Jones, was found about half past ten, an hour or so after the accident. It was lying with the face down, the head under a mine car and the right shoulder on the switchpoint of the left rail of the track leading from Seventh Right Entry thru the breakthru to the aircourse. Apparently the body had not been severely burned. The mouth was somewhat cut and bleeding. The lamp seemed to be in good condition, but was broken when the body was turned over.

The second body was that of Mike Pittner, lying in the right corner of a breakthru to the left of No. 12 Room on No. 7 Right Entry. The clothes were not burned; the face and arms, however, were slightly cut. At the face of the room was a car loaded with "bug dust" which showed no signs of violence. The electric cap lamp was found to be in good condition.

Angelo Rugger, the third body to be recovered, was found lying along the left rib of No. 7 Right Entry about 50 feet outbye of No. 10 Room. The body was badly burned and smashed about the small of the back. One boot was on his foot, the other was down the entry about 100 feet. This man had been the brakeman for the gathering motor.

The motorman, Leroy Lowry, was the fourth man to be found, lying on his face on the right rail in No. 11 Room opposite a breakthru into No. 10 Room. He was pretty badly burned about the face and arms. His lamp was still burning.

Following the recovery of the body of Lowry, the body of Willie Jones was discovered lying face downward in the third breakthru to the left of No. 11 Room. He was burned about the head and face and his nose and mouth were badly smashed. His lamp also was in good condition.

Henry Painter was found lying on his face in the right corner of No. 10 Room near the face. He was badly burned and his lamp was broken.

The above named bodies were found within a few hours of the explosion.

The last body found, that of Charles Buckland, was not discovered until about four o'clock in the afternoon of the following day, due to the fact that it was covered with slate. He was found at the opposite side of the entry from the mouth of No. 10 Room; the clothes were burned off and the body badly burned.

NOTES OF EVIDENCE OBTAINED BY THE BUREAU OF MINES:

The accident was brought to the attention of the Bureau of Mines by a clipping in the Pittsburgh papers which read as follows:

"Mt. Hope, W. Va., Aug. 7, 1919.

Seven men were killed last night in an explosion at a mine of the Berwind-White Coal Company at Weirwood, near here. The cause of the explosion has not been determined. All the bodies were recovered."

On August 11, 1919, and several succeeding days, the writer, L.D. Tracy, visited the mine for the purpose of determining, if possible, the cause of the explosion.

Accompanied by the fire-boss, measurements and air samples were obtained in nearly all of the return air courses, and air samples were taken in No. 10 and No. 11 Room on the Seventh Right Entry. Road dust samples were taken on No. 7 Right Entry at No. 5 Room neck and in No. 11 Room. Coal samples were also taken on 2nd and 3rd left entries off of the main south entry. Copies of the analysis sheets of these air samples and coal and dust samples are attached to this report.

The returns on which the air measurements were taken are practically all of those from the live workings, and an inspection of the analysis sheets hereto attached will show a total return of about 60,000 cu. ft. of air per minute, and in this amount of air there is contained about 116 cu.ft. of methane, or a total of 167,040 cu. ft. of methane every twenty four hours.

In Room No. 11, in which the explosion was supposed to have originated, the air sample (No. 11262) contained 0.73 per cent of methane; and in the adjoining room, No. 10 (Sample No. 11263) 0.90 per cent. At the time these samples were taken the stoppings between No. 7 Right and the air-course had not been rebuilt, and the air current was very slight.

The mine, with the exception of 7th Right, off the east main and possibly one or two entries in that vicinity, is very wet. The rooms on 7th Right and 7th Right Entry, however, are very dusty. The fire-bosses' report shows that he visited 7th Right Entry on the morning of the explosion and that he found no standing gas, but that it was being liberated in all places. No doors were open and the mine was in safe condition.

An examination of the analyses sheets of the road dust found in No. 7 Right Entry will show that in the sample No. 32602, taken on the

entry opposite No. 5 Room the percentage of volatile matter is 15.42 and of fixed carbon 52.22, and that the ratio of volatile matter to total combustible is 22.79. In sample No. 32601, taken at various points along the track in No. 11 Room on 7th Right, the percentage of volatile matter is 16.38 and of fixed carbon 63.07, while the ratio of volatile combustible matter to total combustible matter is 20.62.

In a series of experiments conducted by the Bureau of Mines at its Experimental Mine, it has been determined that with a ratio of 22.79 between volatile combustible and total combustible material it will require about 58 per cent of incombustible material in the dust to render the dust non-explosive. In sample No. 32602 the total incombustible material is the 2.79 per cent moisture and the 29.57 per cent ash, or a total of 32.36 per cent.

In sample No. 32601 the ratio of 20.62 between volatile combustible and total combustible would require a percentage of about 51 per cent of incombustible material in the dust to prevent it from being explosive, whereas the percentage of moisture and of ash totals 20.55 per cent. From those figures it will be seen that both of those samples are below the amount of 58 per cent and 51 per cent respectively which is required to render the dust inert.

Owing to the large amount of slate which had fallen in No. 10 Room, it was impossible to obtain a sample of dust in that room, but it is safe to assume that the dust which had accumulated there previous to the explosion was of a similar nature to the samples above described.

The dust on 7th Right Entry had accumulated in places so that it was two or three inches in depth.

There were heavy falls of slate on the entry and in No. 10 Room on 7th Right. The slate falls covered practically the entire room to a depth of several feet, some of the pieces of slate weighing several tons.

At the face of No. 11 Room there was but little damage done. Three empty cars and a motor near the face were unharmed. A car of "bug dust" standing near the motor showed no signs of an explosion, and a shovel lying on a pile of machine cuttings was undisturbed.

The motor, which was standing near the face of No. 11 Room, received its power thru a cable, mounted on a reel; the free end of the cable being connected to the trolley wire in the entry. An inspection of the motor and cable revealed the following facts. The motor evidently had been pushing an empty mine car to the face of the room and had reached the limit of the cable, as the cable had parted ^{at} the last breakthru. After the explosion, the cable was found to have been entirely unwound from the reel, and the controller of the locomotive was closed. At the point at which the cable had parted it was found that a splice had been made in the cable. At the time at which the writer made his investigation, both of the broken ends of the cable had been cut off and taken to the office of the Mine Superintendent. A later examination of these ends did not reveal any evidence of fusion, nor were either of the steel rails in the room blistered, as it seems probable they would have been in the event of a short circuit between the cable and the rail. The cable was made of about fifty strands of copper wire heavily insulated. Two 40 watt headlights were in use on the locomotive.

At the face of No. 12 Room a breakthru to No. 11 Room had been started, and a portion of the undercut had reached thru. A mine car was standing in the breakthru, and on the end of the car towards No. 11 Room were found a quantity of coke particles. It was learned from the Mine Superintendent that immediately after the explosion one or more large pieces of coke were taken off of the car. There were also some coke particles found on the rib of the breakthru.

The sides of the posts toward No. 12 Room, in the breakthru at the face of No. 13 room, were also covered with coke particles, the opposite side being free from them. The same condition was noted on the posts parallel to and about two feet to the right of the track in No. 13 room. The posts on the extreme right side of No. 13 were entirely free from coke particles.

At the face of No. 11 Room three holes had been drilled and were ready to be loaded and shot. Outside of a comparatively small fall of roof about one hundred feet off the face, No. 11 Room did not show much signs of violence. The same may be said of Rooms 12, 13 and 14. The cap of Ben Jones was found near the face of No. 13 Room, and as has been stated, the body was found on the entry between No. 12 and No. 13.

In the neck of No. 5 Room a cutting machine was found which, to all appearances, was uninjured. From a conversation which the writer had with a number of the men who were acquainted with those who had been killed, it was learned that none of the victims were smokers, so that there would seem to be no reason for any of them to have lighted a match.

The rooms and entry on which the explosion happened are about three feet and a half high and, as has been stated, dry and dusty. From the analysis sheet of Sample No. 11259, which was taken from return split from the south side of the mine, it is seen that the air contained 0.14 per cent methane in a current of 21910 cu. ft per minute, or 44,160 cu. ft. of methane every 24 hours.

Sample No. 11260, taken from the return of the split on 1st Left off the South Main Entry, contains 0.19 per cent methane in a current of 8784 cu. ft. per minute, or approximately 24,000 cu. ft. per twenty four hours.

Sample No. 11261 taken on the return from the 5th Right Split contained 0.14 per cent methane in a current of 9600 cu. ft. of air per minute, or 19,353 cu. ft. of methane in twenty-four hours.

Sample No. 11264 was taken in the return of 7th Right Split and shows 0.28 per cent methane in a current of 19,920 cu. ft. per minute, or a total of 80308 cu. ft. of methane every twenty four hours. This split is from that section of the mine in which the explosion occurred.

This makes a total of over 167,000 cu. ft. of methane per twenty four hours.

BRIEF SUMMARY OF EVIDENCE

1. The mine was rated as a gaseous mine, in which Edison electric safety lamps were used exclusively.

2. A Robinson Fan, operating as an exhaust, furnished about 71,000 cu. ft. of air per minute, at the intake. This current was divided into five splits. Several pairs of entries were ventilated on the same split with 7th Right off the East Main, the section in which the explosion occurred.

3. In that section of the mine which was the scene of the accident, the haulage was done on the return air courses by trolley locomotives.

4. From measurements of the air currents and analyses of the air samples, it is estimated that the mine is giving off over 167,000 cu. ft. of methane every twenty-four hours.

5. The return from 7th Right Entry off the East Main contained 0.28 per cent methane in an air current of 19920 cu. ft. per minute, or 80308 cu. ft. of methane every twenty-four hours.

6. Gas was given off freely in No. 10 and No. 11 Rooms on No. 7 Right Entry off the East Main.

7. The greater part of the mine is more or less wet, but 7th Right is dry and dusty. Samples of dust from this entry were taken, and, when analyzed, found to be explosive.

8. The door on 7th Right between No. 2 and No. 3 Rooms, and the door between the Main East Entry and Aircourse opposite No. 8 Left were destroyed, while the door between Main East and Aircourse at 7th Left was not harmed. All stoppings between 7th Right and Aircourse were blown out.

9. The bodies of the two men, Sam Jones and Mike Pittner,

were found in by the supposed origin of the explosion and appeared to be the least burned of any. Angelo Rugger, the gathering motor brakeman, was perhaps the most badly injured of the seven men, and his body was found the farthest away from the point of origin. Leroy Lowry, the motorman, was found near the point at which the explosion was supposed to have originated, and was badly burned. Henry Painter, miner, and Chas. Buckland, shot-firer, were found in or near No. 10 Room, both badly burned.

10. The fall of slate in No. 10 Room on 7th Right was exceedingly heavy, but on the entry proper and the remaining rooms the falls were slight.

11. A gathering locomotive operated by an electric cable was found near the face of No. 11 Room. The controller was closed, but the cable had parted at a splice. ✓

12. Some empty cars and a car loaded with machine cuttings standing between the motor and the face of No. 11 Room showed little if any signs of violence.

13. Coked particles were found in a car standing in a breakthru between No. 11 and No. 12 rooms, and on one side of posts in the breakthru between No. 12 and No. 13 rooms.

14. At the face of No. 11 Room three holes had been drilled and were ready to be loaded and shot. ✓

15. A cutting machine standing in No. 5 Room neck was uninjured.

16. The statement was made that none of the men who were killed were smokers.

17. Two men cutting coal in No. 1 Room off of No. 2 Room on 7th Right, immediately after the explosion reported that the door between 7th Right and 7th Right aircourse was open. These men were not harmed at the time of the explosion, and were the ones who notified the night foreman of the accident.

CONCLUSIONS:

From the evidence obtained from personal inspection, and from accounts of those who were at the mine immediately after the explosion, the following conclusions have been reached:

From the report of the fire boss, and also from the analyses of the mine air samples taken from No. 10 Room and No. 11 Room on 7th Right Entry on the Main East, there can be no doubt that methane was being given off in considerable quantities in these rooms. Moreover, as they were on the return, any explosive gas generated in the rooms and entries which are ventilated by the same air current before it reaches these rooms would be added to the amount of gas given off by them.

In some way there was an accumulation of gas in one of these rooms sufficient to produce an explosion. As the men were using electric cap lamps there was no way by which they could know whether or not such an accumulation had occurred. As far as the writer knows, there were no flame safety lamps in the vicinity, nor were these places tested for explosive gas immediately previous to the night shift going to work. There is no evidence to show that even the shot firer had a flame safety lamp.

The two men who were cutting coal in No. 2 Room report finding the door open between 7th Right and the aircourse. This may have been left open by the motorman or brakeman when they ran a trip of empties up the entry. If so, it would have occasioned a short circuit of air, and thus caused the accumulation of gas in No. 10 and No. 11 Rooms. It would seem probable that this was the case, as the door was uninjured after the explosion, while the door across the entry between No. 2 and No. 3 Rooms was destroyed. There is the possibility, however, that the door opened in the same direction as the face of the explosion, and in that case there is a chance that it may have been blown open and then partially closed by the retention wave.

The writer is inclined to believe that the door was left open, for the reason that it is the only way in which to account for the quantity of gas which must have accumulated to have produced an explosion as violent as indicated by the damage done.

The question then presents itself as to the cause of the ignition of the gas so accumulated. As there were no open lights used, and the associates of the men who were killed say that none of the latter were in the habit of smoking, the only remaining cause is to be found in some part of the electrical equipment. That there was no sign of an explosion at the electric locomotive, and that there was a break in the cable carrying power from the trolley wire in the entry to the motor, seems to point conclusively to the fact that the gas was ignited by the arc formed at the instant the cable parted. The fact that the ends of the wires in the broken ends of

the cable were not fused has caused considerable comment among officials at the mine.

Several tests of similar cables, with varying electric currents, were made at the electrical testing laboratories of the Bureau of Mines, and it was found that it would be possible to produce an arc sufficient to ignite an explosive mixture, yet which might not fuse the cables. This was done by using a 250 volt current with a low amperage.

It is quite safe to assume that the motorman was shutting off the power when the cable broke, hence the amperage was very low. It is the opinion of the writer that in pushing his trip, the motorman exhausted the cable on the reel, and the tension caused the cable to fly up near the roof and then part, causing an arc sufficient to ignite the gas. Upon seeing the ignition of the gas, the motorman evidently attempted to escape and was overcome about 30 feet from the motor. The resulting explosion raised a cloud of dust which increased the violence to such an extent that the posts in No. 10 Room were blown down, thereby causing the slate falls in that room. The explosion wave also travelled through the breakthrus into No. 12 and No. 13 rooms. The coke particles found in these rooms indicate that the coal dust was a factor in the explosion.

The explosion has been attributed, by some of the officials, to the liberation of gas by the fall of slate in No. 10 room, which gas became ignited.

In the opinion of the writer, the fall of slate and the arc from the broken cable would have to be practically simultaneous, unless

there had been previous accumulation of gas in No. 11 Room. If the slate had fallen at any considerable length of time previous to the explosion, the man working at the face of No. 10 Room would either have tried to escape by crawling over the falls, or would have been caught by the explosion while making his way out. As it was, his body was found at the right face of the room, showing, it would seem, that he had had no warning of danger. It would hardly seem probable that the fall of slate would occur at the same time that the splice in the cable would part and cause an am.

An examination of analysis sheets of the samples of mine air in Rooms No. 10 and No. 11 will show that enough gas is being given off in these rooms to quickly accumulate an explosive mixture, should there be any interruption to the ventilating current. It would seem that such a theory involves too many assumptions, and in the opinion of the writer the most natural and simplest solution is the best, namely, that the breaking of the cable caused a spark which ignited an accumulation of gas caused by some interruption of the ventilating system.

RECOMMENDATIONS:

It is the intention of the Coal Company, according to information given the writer, to abandon the east section of the mine for the present, and to develop the south section. The main south entries are now headed for the Eccles field, and there can be but little doubt that the hazard from CH_4 will be present even to a larger degree than at the present time.

The writer is aware that the company is operating under difficulties, owing to the uncertain character of the coal seam, and the expense involved in driving additional entries and constructing overcasts, etc. In the event, however, that the coal seam proves of sufficient regularity to warrant a more systematic development, it is believed that the adoption of the following recommendations would materially reduce the explosion hazards.

1. Some auxiliary power for operating the fan, either a steam or an internal combustion engine, should be placed in reserve, in case any accident should occur which might disable the power line from the Central Station, or to the Central Station itself; because any interruption to the ventilation system, even for a brief period of time, might result seriously.

Provisions have been made, by the installation of a steel stairway in the air shaft, for the miners to come up from the mine in case the hoisting machinery is put out of commission.

2. It is believed that one or more additional firebooses should be employed and that they should examine each working place at as short intervals as possible whenever there are any men working in the mine, and also that they should have direct supervision over all shooting in the mine.

3. At present there are several pairs of butt entries ventilated by the same split, necessitating the use of a number of doors. The entries from which rooms are turned are, in many cases, used as a return for the air, and therefore the haulage motors are operating on the return air courses.

It would seem advisable, as far as possible, to so arrange the ventilating system that the fresh air should pass directly to the entry from which the rooms are turned, and the entry now known as the aircourse should be used as a return. An additional entry should be driven parallel to the present main entries, one of which should be used entirely as an aircourse. Overcasts should be constructed wherever practicable in order to lessen the number of doors, and thereby reduce the chances of short circuiting the air. It is believed that the Company contemplates additional entries, similar to the above mentioned system, whenever the coal seam shows a sufficient regularity to warrant the expenditure of the money.

While Section 52 of the mine law of West Virginia requires that trolley locomotives in gaseous mines shall be operated on the intake airway fresh from the outside, it does not appear that a failure to observe this requirement was responsible for the explosion since in the event that it had been observed, a suspension of ventilation would have permitted an accumulation of gas in the rooms involved.

4. In the future, whenever additional mining machines are purchased, it is recommended that those machines which are classed as "permissible" by the Bureau of Mines be given first consideration.

5. A rigid systematic inspection of all trailing electric cables should be made in order to avoid as far as possible any chance of a short circuit by which a body of gas may be ignited. In this connection it may

be of interest to note that a case has recently come to the attention of the Bureau of Mines in which a container containing explosives was brought in contact with the feed cable of a mining machine. The insulation had been worn off, and a short circuit was established by which the explosive was set off, seriously injuring a number of men.

It should be borne in mind that in any mining machine or locomotive using a trailing cable, one of the weakest points, if not the weakest point, from the standpoint of safety, is the cable carrying the electric current from the main line to the machine. No matter how much precaution may be taken to prevent gas from ignition by the sparking of the machine, if the insulation on the cable is defective, these precautions are taken in vain.

6. Whenever the slate is "gobbed" on one side of any entry, in order to prevent an explosion of any dust which may accumulate thereon, it would be advisable to dust these slate piles with sufficient rock dust to render the coal dust inert; and as an additional precaution it would be well to install rock dust barriers across the main entries in order to limit the area affected by any explosion which might occur.

7. Accompanying this report is a sketch showing a section of the shaft and shaft bottom. It will be noticed that the roof has been shot down at its junction with the side of the shaft. This was done, no doubt, to enable long timbers and other large materials to be more easily handled. A protection should be placed here, in the form of a door which

can either be raised or swung aside when necessary, because as it is, any timbers or other supplies may fall down the shaft and any man who may happen to be working near the cage is liable to serious injury.

8. At the time this investigation was made, it was observed that three or four men were required to push a loaded car on to the cage. By raising the tracks for a short distance back from the shaft bottom, it is believed that a sufficient grade could be obtained to allow the cars to drift on to the cage by force of gravity, so that the men would not be obliged to work at the edge of the cage. In addition to being safer, the cars could be placed on the cage in much less time, and it would be an economic gain.

ACKNOWLEDGMENTS:

The writer wishes to acknowledge the assistance given and the courtesy shown to him by Mr. H. M. Sertolet, General Manager, and Mr. A. F. Marshall, Superintendent, of the New River and Pocahontas Coal Company.

Respectfully submitted,

G. P. Tracy

Coal Mining Engineer.

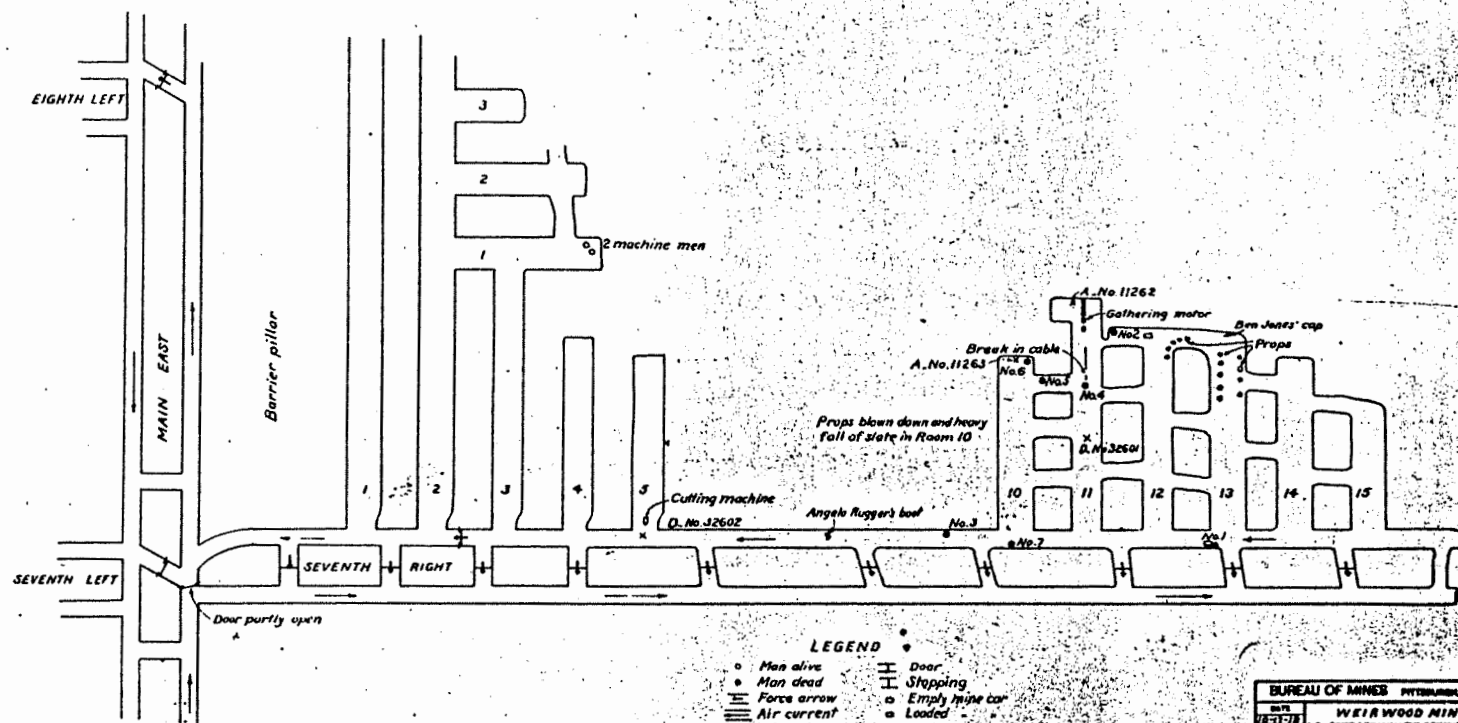
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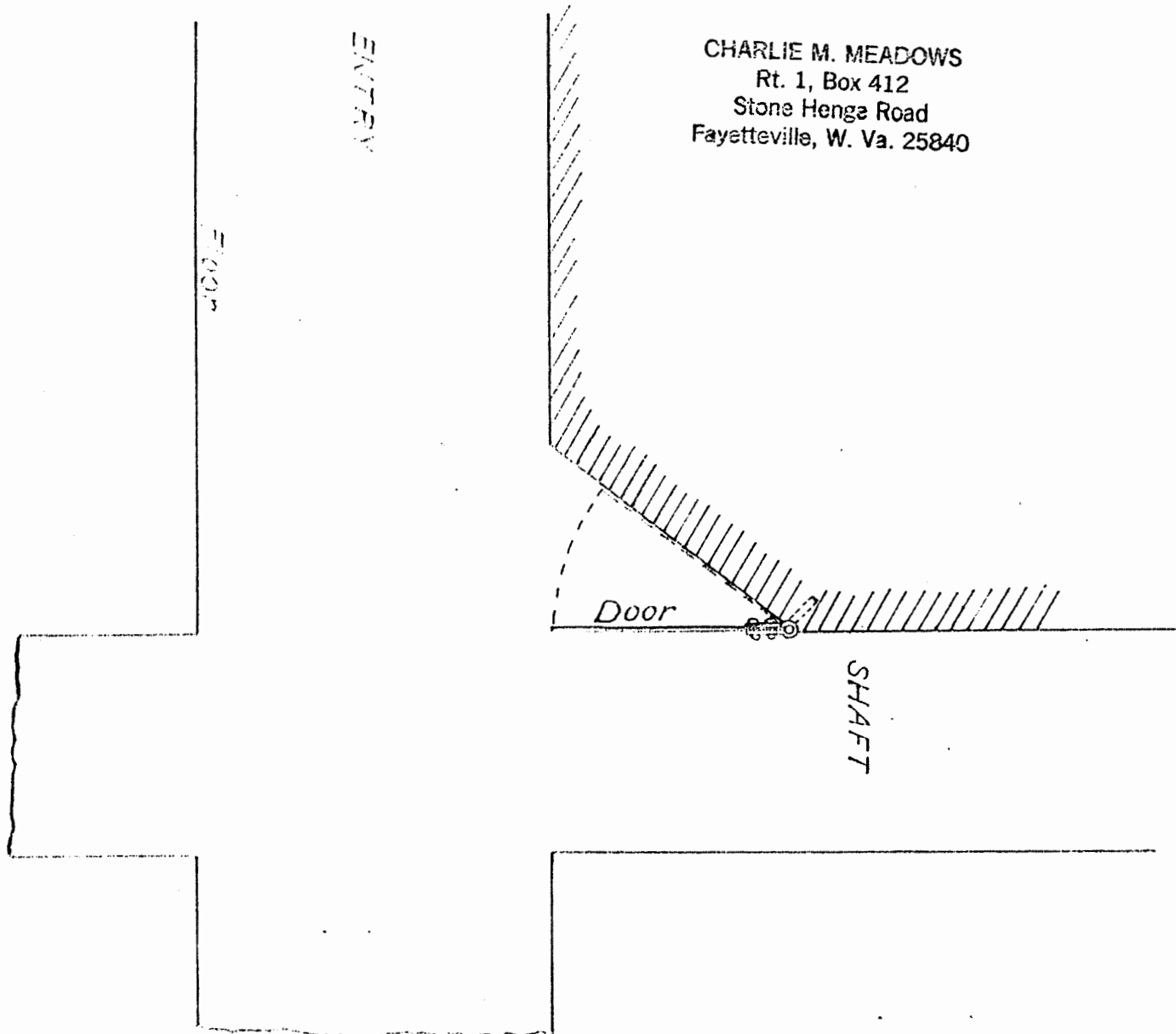


LEGEND

- Man alive
- Man dead
- Force arrow
- Air current
- A. No. 11262
- D. No. 32602
- Door
- Stopping
- Empty mine car
- Loaded
- Air sample
- Dust sample

BUREAU OF MINES		PITTSBURGH, PA.
DATE	MAY 18 1938	
BY	W. R. WOOD MINE	
NEW RIVER OPERATIONS COMPANY COAL CO.	NEAR PINE, FAYETTE CO., W. VA.	
EXPLOSION, AUGUST 6, 1938		
NAME OF	H. J. Jones	
DESIGNED BY	H. J. Jones	
APPROVED BY	C. 182	

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SUGGESTED ARRANGEMENT OF SAFETY DOOR
FOR BOTTOM OF SHAFT
WEIRWOOD MINE

E-166