

EXPLOSION REPORT
PIONEER MINE
PIONEER COAL COMPANY
KETTLE ISLAND, BELL COUNTY, KENTUCKY

On March 29, 1930, between 2:10 and 2:20 p.m. an explosion occurred in a section of the Pioneer mine of the Pioneer Coal Company, known as the No. 2 opening, located at Kettle Island, Bell County, Kentucky.

At the time of the explosion, there were sixteen men in this section, all of whom were killed. Practically all of the number two opening section of the mine was involved in the explosion. A more wide-spread explosion, involving a part of the number one opening, was probably prevented by a very wet section. The part of the mine involved was dry and dusty; no rock-dusting had ever been attempted; sprinkling of haulage-ways was done occasionally.

When advised of the explosion, Mr. E. H. Graff, Mr. N. L. Nowry and Mr. J. F. Davies, all of the United States Bureau of Mines, were attending a conference in the office of Chief Mine Inspector, John F. Daniel, at Lexington, Kentucky. All persons at this meeting immediately proceeded by autos to Pineville, Kentucky, a distance of about 122 miles. At Pineville, the Louisville and Nashville Railroad Company had in readiness a special train which took the party to the mine, arriving shortly before 8:00 p.m.

On board this special train were, Mr. John F. Daniel, Chief Inspector, Mr. W. H. Martin, District Mine Inspector, Mr. James F. Bryson, Director of Safety, the Harlan County Coal Operators' Assn., Mr. L. W. Huber, District representative of the Mine Safety Appliances Company, Mr. N. L. Muir, salesman for the Mine Safety Appliance Co., Mr. E. H. Graff, Senior Foreman Miner, U. S. Bureau of Mines, Mr. N. L. Mowry, Foreman Miner, U. S. Bureau of Mines, Mr. J. F. Davies, Assistant Mining Engineer, U. S. Bureau of Mines, and others. Upon their arrival at the mine the recovery work was turned over to them. Direction of recovery operations was given over to a group consisting of Mr. John F. Daniel, Mr. James F. Bryson, Mr. L. W. Huber, and Mr. J. F. Davies.

OWNERSHIP

The Pioneer Mine is owned and operated by the Pioneer Coal Company, with offices at Kettle Island, Bell County, Kentucky, and Louisville, Kentucky.

The officials of the company are as follows:

W. S. Speed,	President,	Louisville, Ky.
B. F. Reed,	Vice. Pres.,	do
C. D. Major,	Treasurer,	"
C. S. Hield,	Gen. Manager,	" and Kettle Island,
H. E. Grace,	Mine Supt.,	Kettle Island, Ky.
J. E. Hill,	Mine Foreman	(deceased)

LOCATION

The mine is located at Kettle Island, Bell County, Kentucky, and is served by a branch of the Louisville and Nashville Railroad.

EMPLOYEES

There are employed underground an average of about 220 men, 160 loaders and 40 day laborers. On the surface there are 24 men employed. The average daily production is 1200 tons with the maximum production for one day of 1600 tons. During the year of 1929, 280,029 tons were produced.

OPENINGS

This is a drift mine, having six openings. Two openings are used for haulageways; two are fan drifts, and two are "crop" openings.

COAL BED

The Pioneer mine is operating in what is known as the Straight Creek coal bed. The average thickness of the coal seam is about 58 inches. It is practically free of impurities.

ROOF AND FLOOR

Generally, there is a hard gray slate immediately above the coal, although in some places the main sandstone roof rests directly upon the coal.

The following is a recent commercial analysis of coal as loaded.

<u>Moisture</u>	<u>Volatile Matter</u>	<u>Fixed Carbon</u>	<u>Ash</u>	<u>Sulphur</u>	<u>BTU</u>
2.08	39.67	54.00	4.25	.89	14249

Following are the analyses of samples collected in the Pioneer mine in 1918 by the United States Bureau of Mines representative and analysed in the Pittsburgh laboratory of the Bureau.

<u>Lab.No.</u>	<u>Moist.</u>	<u>Vol.Matter</u>	<u>Fixed Carbon</u>	<u>Ash</u>	<u>Sulphur</u>
21547	4.5	57.1	55.5	4.8	1.2
21548	4.6	57.5	52.9	5.0	1.5
21549	5.8	56.0	54.6	5.7	1.3
21550	5.9	57.1	55.9	5.1	1.5
Composite of 21547 to 21550	4.2	57.2	53.9	4.7	1.4

METHOD OF MINING

A room and pillar plan is being followed. In some entries rooms are turned off both entry and aircourse; in others, rooms are turned only off aircourses. No pillar coal is being recovered. Room entries are turned on 200 foot centers. Rooms are turned on 55 to 60 foot centers and are driven from 25 to 40 feet wide and 115 to 140 feet deep. Chain pillars are about 30 x 60 feet. Room pillars are about 15 to 30 feet wide.

There are no timbering rules followed; timbers are placed only where the miners deem them necessary. Comparatively little timbering is used over most of the mine. The roof stands exceptionally well, as only one fall of roof of any consequence was encountered during the recovery work.

All coal is undercut by electrical mining machines before being shot. Sullivan shortwall electric mining machines are used. These are of the GE6, GE7, GE10, type, having 6½ foot cutterbars. These are of a permissible type; all operate on 250 volts direct current.

All coal is hand loaded.

VENTILATION AND GAS

There are three fans used to ventilate the mine. A 5 x 6 Jeffry Centrifugal fan is located directly in front of the No. 2 aircourse opening.

A six foot disc fan is located directly in front of the No. 1 aircourse opening. A second disc fan is located inside the No. 1 section at the 16th right off 1st main. This fan acts as a booster to the disc fan at the mouth of the No. 1 opening.

The section involved in the explosion was ventilated by the Jeffry Centrifugal fan which was run exhausting. The return when measured by the writer on April 10, 1950, indicated 65000 cubic feet per minute. The Jeffry fan is fitted with suitable doors for changing from exhausting to blowing, but it is not fitted with explosion doors.

During the recovery work, appreciable quantities of methane were encountered. Gas was detected about 160 feet outby the face of the entry in which the last body was found.

The mine is known to liberate appreciable quantities of methane.

Fire boss examinations were made before men entered in the mornings. Regular fire bosses were not employed but these examinations were made by mine foreman, assistant mine foreman, and mining engineer. These examinations were more or less cursory, as only entry and aircourse headings were examined.

On the last day of the investigation an appreciably large body of gas was found in the 3rd right off 3rd left off 13th right off 12th left off 1st main. Air samples in bottles numbered 539 and 540, were collected at this point and indicate the condition existing at that time. These analyses show 5.16 and 5.20 per cent methane, respectively.

On the following page are analyses of air samples collected during the investigation, and were analyzed in the Pittsburgh laboratory of the U. S. Bureau of Mines.

These samples were collected at a time when the air was flowing in a reverse direction from that of the day of the explosion.

RESULTS OF ANALYSES AIR SAMPLES

<u>Lab.No.</u>	<u>Bottle #</u>	<u>CO₂</u>	<u>O₂</u>	<u>CH₄</u>	<u>H₂</u>	<u>Vel.Air</u>	<u>CH₄ pr 24 hrs.</u>
52238	257	.11	20.83	.04	79.02	17850	10281.6 cu.ft.
52239	255	.11	20.81	.04	79.04	17850	10281.6 do
52240	241	.16	20.78	.05	79.05	--	--
52241	225	.23	20.72	.05	79.02	--	--
52242	557	.15	20.76	.11	78.98	15200	20908.8
52243	558	.14	20.82	.10	78.94	15200	19008.0
52244	104	.15	20.77	.05	79.05	9860	7099.2
52245	105	.16	20.76	.04	79.04	9860	5679.56
52246	559	.47	19.36	5.16	75.01	--	--
52247	540	.57	19.84	5.20	75.59	--	--
52248	244	.18	20.72	.11	78.99	15400	24395.6
52249	228	.12	20.75	.12	78.97	15400	26611.2
52250	105	.13	20.80	.10	78.97	65000	95800.
52251	106	.13	20.77	.11	78.99	65000	102960.
52252	555	.15	20.71	.16	78.98	10800	14885.8
52253	556	.13	20.71	.16	79.00	10800	14885.8
52254	113	.19	20.70	.12	78.99	12100	20908.8
52255	111	.17	20.72	.14	78.97	12100	24395.6
52256	245					--	--

The foregoing analyses show that appreciable quantities of methane are being liberated in this mine.

Bottles Nos. 237 and 245, which were collected on the 1st main indicated that 10281.6 cubic feet of methane per 24 hours is being carried past the point where these samples were collected, a point locally considered as fresh intake air.

Bottles Nos. 103 and 104 were collected at the mouth of 1st left off 12th right off 1st main and these show 5679.36 cubic feet and 7099.2 cubic feet of methane, calculated for 24 hours.

These samples collected in bottles Nos. 537 and 538, show respectively, 20908.8 and 19008.0 cubic feet of methane, calculated for 24 hours. These samples were collected on the 1st left off 1st left off 13th right off 12th right off 1st main.

Samples collected in bottles Nos. 244 and 228 show respectively, 24393.6 cubic feet and 26611.2 cubic feet of methane, calculated for 24 hours. They were collected on 1st left just in by 5th right off 13th right off 12th right off 1st main.

Samples collected in bottles Nos. 113 and 111 show respectively, when calculated for 24 hours, 20908.8 cubic feet and 24393.6 cubic feet of methane. These two samples were collected on the 5th right off 1st left off 13th right off 12th right off 1st main.

Samples collected in bottles Nos. 535 and 536, when calculated for 24 hours, indicate there is 14883.8 cubic feet of methane passing this point. They were collected on the 1st right off 3rd left off

13th right off 12th right off 1st main.

Samples of the full return at the number two fan show, when calculated for 24 hours, 93600 cubic feet and 102960 cubic feet of methane. These samples indicate that there is an average of 98380 cubic feet of methane carried out of the mine at this opening in 24 hours.

The samples collected in bottles Nos. 539 and 540 indicate a body of standing gas, which is indicated by No. 539, to be very near, if not within, the explosive range. These two samples indicate an extremely dangerous condition.

The U. S. Bureau of Mines has found that as little as thirteen cubic feet of methane, when mixed with air to form an explosive mixture, and lighted, will give the necessary impetus to create a very disastrous explosion when coal dust is present.

HAULAGE

Haulage and gathering are done by means of trolley type electric locomotives, operating on 250 volt direct current power.

Rails of thirty-five and forty pound weight, laid to 42 inch gauge are used on haulageways.

One rail is bonded on room entry haulage. Both rails are bonded on main haulage and cross bonded about every 200 feet.

Trolley wires are located directly over the rail, are well supported but are low in places.

No effective guarding of trolley wires is done, although split rubber and fabric hose has been placed at several points. These do not constitute effective guards.

The haulage is not planned with reference to intake or return air currents.

Cars of one-ton capacity are used; they are of the lift end-gate type, well fitted. Some of the cars are of steel and wood composite construction and others are of wood. Nearly all loaded cars are topped and some loss of coal results.

The haulageways are comparatively clean, although there is an appreciable amount of fine coal along all of them.

Entry switches are equipped with bridle bars and throw levers. All of the throw levers observed, operated at right angle to the track.

Apparently no rule regarding clearance along haulageways is observed.

No regular refuge holes are prepared along haulageways.

Each motorman hauls the men in^{to} and out of his section, running his first trip in the morning and the last trip at night as man trips.

Occasionally, when a group of men are ready to come out during the day, ~~empty~~ cars, are attached to regular trips for them to ride in.

LIGHTING

Miners use carbide lights.

Examinations for gas are made with key-locked safety lamps.

These lamps are of the Baby Wolf, and Standard Kochler and Wolf types.

There is maintained a few electric cap lamps of the Wheat type for use in emergencies.

Aside from an occasional incandescent lamp attached to trolley circuit at switches, telephones and occasionally along haulageways, no lighting of haulageways is attempted.

MACHINERY UNDERGROUND

None of the machinery underground is of a permissible type.

There are underground, six electrically driven pumps, thirteen electrically driven mining machines, ten electric locomotives of the trolley type, one electrically driven booster fan, one rotary converter set and two sets of oil transformers, and one portable electrically driven pump which is used for sprinkling purposes.

ELECTRICITY

Purchased electric power is used throughout. An armored cable carrying 2300 volts alternating current enters the mine through a drill hole on the 7th right airway off the 12th right off 1st main and

transmits power to the rotary converter set which is in a brick and concrete room, located in a crosscut between the 12th right entry and aircourse, just outby the 10th right off 12th right off 1st main.

This cable is tapped near the drill hole and a lead taken to a bank of transformers, located in the 7th right entry off 12th right off 1st main. At these transformers the voltage is reduced to 440 volts and this circuit is used to operate a centrifugal pump which is located nearby the transformers.

These transformers present a serious fire hazard as they are placed only slightly elevated from the floor and within two feet of exposed coal. No fireproofing or fire protection is afforded.

In the room where the rotary converter set is located there is also a bank of three transformers. This room is not strictly fireproof, the brick walls extend only to the top of the coal, and the rest of the sidewalls and the ceiling is cement coated. The floor is concrete. The doors are of wood and open directly onto the 12th right haulageway. There is only one fire extinguisher; it is a one quart Pyrene, gun type and is hanging on wall inside of the doors and would not be effective except in case of a fire in its very incipiency.

The armored cable is lying on the floor of the 12th right aircourse and is covered by an inverted wooden trough.

None of the pumps are located in fireproof rooms.

EXPLOSIVES

Permissible explosives are presumably used in shooting all coal.

Herc~~o~~A F is the brand of explosives used. For shooting of roof or floor, pellet powder is used principally, and occasionally Herc~~o~~A F permissible.

During the recovery work, 60 per cent dynamite was mentioned as being used to shoot out timbers, however, the writer was informed by officials that no dynamite is used.

Shots are drilled, prepared and fired by the miners. The maximum depth of holes in the coal is said to be six feet. The charges in coal shots are from 1 to 1½ sticks of permissible explosive. In rock shots, three sticks of pellet powder are used. Shots are fired at any time during the shift.

Shots are fired singly, by means of shooting cable and dry cell battery. These batteries have recessed terminals.

Clay from outside of the mine is used for stemming.

Wooden tamping sticks are used.

Number 6 detonators (electric) are used. The legs of the detonators are "shorted" by means of metal clips.

The storage magazine is located in a hollow remote from the mine and dwellings. From two to three days' supply of explosives and detonators are kept in a frame building near the mine. This building is about 700 feet from the school building and about 600 feet from the nearest mine openings. The supply is said to be about four cases of explosives and either a case or partial case of detonators.

The explosives and detonators are delivered into the mine in wooden boxes. These boxes are about 16 inches long and 9 inches wide and 8 inches deep, with a partition which forms two compartments, one for the explosives, the other for detonators. These boxes are nailed together and have hinged covers and a handle. From ten to eighteen sticks of explosives, with from 6 to 12 detonators are placed in these boxes and they are hauled in regular trips. The boxes are placed along the roadways near the ribs underground.

DRAINAGE

All of the mine involved in the explosion was dry, however, a section adjacent to this part of the mine is very wet. Six pumps are kept running regularly to prevent flooding of haulageways. Considerable water was standing on the 12th right haulageway during and after the recovery work.

DUST

All of the mine involved in the explosion was dry and dusty. No rock-dusting has ever been done in this mine. No water is used on cutterbars, neither is the coal wetted before or after shooting. Machine cuttings are supposed to be loaded out before shots are fired.

On the following page are the results of analysis of roof, rib and floor dusts collected on April 10, 1950.

These results are on the "as received" basis.

RESULTS OF ANALYSIS OF DUST SAMPLES

<u>Lab.No.</u>	<u>Can No.</u>	<u>Mois- ture</u>	<u>Combustible (as received)</u>	<u>Ash</u>	<u>Sizing</u>		
					<u>Thru 48</u>	<u>Thru 100</u>	<u>Thru 200</u>
A60720	B-209	1.1	65.5	33.6	-	-	-
A60721	F-255	2.1	59.5	39.4	56.5	33.7	20.8
A60722	D-85	1.4	69.7	29.9	56.5	33.7	-
A60723	25006	2.1	57.5	40.5	52.9	28.9	15.5
A60724	F-461	1.5	64.2	34.5	-	-	-
A60725	B-755	3.1	65.1	33.8	58.5	37.2	25.1
A60726	F-457	6.4	63.2	30.4	-	-	-
A60727	A-45	2.1	59.5	38.4	53.8	33.2	21.5

The U. S. Bureau of Mines and the American Engineering Standards Committee, recommend that in order to prevent propagation of an explosion by coal dust, the percentage of incombustible material shall be maintained at least 85 per cent where no inflammable gas is present and shall be raised 10 per cent for each 1 per cent of gas.

The volatile ratio calculated from the analysis of samples collected in this mine is .405 plus.

There are three factors to be considered in the study of coal dust hazard. The total combustible content, the volatile ratio, and the fineness of the dust.

The volatile ratio of the coal of this mine is .405 plus while the volatile ratio of Pittsburgh coal is .40, and it is definitely known that Pittsburgh coal is highly explosive, consequently, since the volatile ratio of this coal is even higher than that of Pittsburgh coal, it is obvious that a condition as indicated by the foregoing samples, constitutes a serious explosion hazard.

The foregoing analyses show low moisture, high combustible, and low incombustible contents.

All of the screen tests show very appreciable percentage of very fine dust, from 13.5 per cent to 25.1 per cent passing through 200 mesh screen, and 52.9 per cent to 58.5 per cent passing through 48 mesh screen.

The U. S. Bureau of Mines has found that all dust that will pass through 80 mesh screen is capable of entering into the propagation of an explosion when raised into suspension.

PROPERTY DAMAGE

All of the doors and stoppings were destroyed over a very considerable area of the mine. However, it is the writer's opinion that no great forces ~~was~~ ^{was} required to do this, as most of the stoppings are of single board, roughly sawed lumber, with the cracks filled with plaster. The concrete seals that were destroyed, evidently were about four inches thick and not hitched into the rib, but only butted against the ribs, roof, and floor.

Doors are of single board, grooved and tongued lumber, built on two by four framing. Two of the doors destroyed were of an automatic type.

FORCES WITH RELATION TO BODIES THAT WERE APPARENTLY MOVED

All of the bodies showed evidence of heat, but the body of Mr. Hill, which was found about 116 feet outby the face of the 3rd right entry off 3rd left off 15th right off 12th right off 1st main, showed the effect of flame more than any of the others. Part of his clothing was burned.

Apparently the three men found in the 9th right off 1st left off 15th right off 12th right off 1st main, had traveled short distances after the explosion. Although no footprints were noted, the positions of the bodies would indicate they had walked after having either heard or felt the explosion. One of them had apparently fallen, striking his forehead on a tie. Another had his coat on and apparently had set his bucket down beside him and laid down, protecting his face and head with his hands and arms. The other one had apparently crawled close against the rib and died.

The man found in the 4th right off 1st left off 1st left off 15th right off 12th right off 1st main, quite probably had staggered some distance before falling on his face near the rib.

It is the writer's opinion that the body of Hill had been carried at least a short distance inby, by the forces. His carbide lamp and cap were found about 51 feet inby his body. Apparently, three of the bodies found near the 4th right off 1st left off 15th right off 12th right

1st main, had been carried short distances by the forces. The body of the motorman was found on the inby side of a partly blownout brattice, apparently carried there by a force moving through the crosscut from the 1st left aircourse. The positions of these bodies are shown in the drawings.

It is believed that all of the others died without being aware of what had happened.

EVIDENCE OF HEAT AND FLAME

The heaviest deposits of coke were found on a ledge of rock and projecting timber, located on the left hand side of the 3rd right entry off the 3rd left off 13th right off 12th right off 1st main, about 80 feet inby the 3rd left entry. These deposits were very heavy and were on the inby side. There were also a few globules of coke on the inby side of several of the timbers at this point.

Soot streamers were noted on trolley wire and projections from a point on the 3rd left off 13th right off 12th right off 1st main, about 20 feet outby the 6th right, into the 6th right and into the 3rd left entry, and extended a short distance along the 5th right off 1st left where this entry intersects with the 3rd left off 13th right.

Light coking was noted along the 3rd left entry off 13th right.

Coking was noted all along the 1st left entry off the 13th right off 12th right off 1st main.

The heaviest deposits of coke in this region, were observed in the 8th right off 1st left off 13th right off 12th right off 1st main. This coking was about evenly deposited on floor and timbers throughout,

except near the 1st left entry, where the deposits were heaviest on the inby sides of timbers.

Very light soot deposits were noted near the faces of the 1st left entry and aircourse entries off the 13th right, and in the 10th right entry and aircourse off 1st left off 13th right off 12th right.

Heavy streamers of soot were noted on all projections, and the roof in an area extending from about 200 feet outby the 4th right off 1st left off 1st left off 13th right off 12th right off 1st left, along the 1st left and into the 4th right off 1st left.

DIRECTION AND INTENSITY OF FORCES

There was no indications of extreme violence anywhere. The principal forces appeared to radiate from an area on the 4th right off 1st left off 13th right off 12th right off 1st main. The direction of forces are indicated by arrows on the accompanying map.

There seemed to have been forces in both directions along the 1st left entry off the 13th right off 12th right off 1st main inby the 5th right. A destructive force appeared to have moved inby, demolishing doors and stoppings, then a retreating wave moved outby, carrying light debris. The writer's reason for this assumption is that the door of the 7th right off 1st left was not demolished, but the door frame was moved inward, with the door standing open and light debris thrown outward. Evidently this door had been left propped open, as it was not greatly damaged. A very short time previous to the explosion, thirty-five loaded cars had been switched into this entry and the two men

working in there had come out to the point on 1st left where their bodies were found. Another indication of two forces in the 1st left entry was that an automatic door, located on 1st left entry just inby of 9th right was destroyed, a part being carried inby about 80 feet; a part of this door which was bolted to the operating mechanism was thrown outby.

An appreciable force appeared to have moved inby along the 1st left entry off 1st left off 15th right off 12th right off 1st main, demolishing doors and stoppings as it advanced. A cushioning of this force seemed to have become effective near the mouth of the 4th right off this entry, as there was a general scattering of light materials in the area. This force seems to have expended itself, or was materially reduced by expansion into the territory in the 12th right off 1st main and the 1st and 2nd right entries off the 10th left off 12th right. There being just force enough to push out the stoppings and doors in the mouth of 1st and 2nd right off 10th left off 12th right.

The greatest forces appear to have moved outby through the 1st, 2nd and 3rd right entries off the 1st left off 13th right off 12th right off 1st main. These forces demolished concrete stoppings at the intersection of these entries with the 3rd left off 12th right off 12th right off 1st main.

A force apparently moved outby along the 1st left off 13th right off 12th right off 1st main. This force appears to have divided at the intersection of the 1st left with 13th right, part of it moving along the 13th right outby towards number two opening. An automatic door

on the 15th right, located between the 1st right off 15th right and 3rd left off 15th right, was badly damaged by a force moving outby towards number two opening.

The forces moving towards number two opening demolished stoppings in room necks off number 2 main and demolished the floor of the overcast, located at the intersection of the 5th right and 2nd left with the number two main.

The forces were sufficiently strong at the fan at number two opening to stop the fan. The doors of the fan housing, used to change the direction of air flow, were blown open. The opening of these doors no doubt protected the fan from damage. These doors referred to on the fan, are not explosion doors, but fortunately, in this instance, opened outward.

CONCLUSIONS AS TO THE CAUSE OF THE EXPLOSION

The Chief Mine Inspector, company officials, and others, in their conclusions, assume that the explosion originated near the face of the 3rd right off 3rd left off 15th right off 12th right off 1st main. It is their belief that the mine foreman walked into a body of methane and air of an explosive mixture. This mixture it is assumed, was ignited by the flame of a carbide lamp carried on the mine foreman's cap, which presumably, was on his head. The explosion ~~was~~ propagated by coal dust. The writer does not concur in this conclusion. AS TO POINT OF ORIGIN.

It is the writer's opinion that the explosion was initiated at a point on the 4th right off 1st left off 15th right off 12th right off 1st main. It is his opinion that a body of methane

and air mixture was ignited by the flame of a carbide lamp which was carried by the motorman, whose body was found in the 1st crosscut between the 1st left entry and aircourse just inby the 4th right entry. This opinion on the part of the writer, is based upon the evidence of forces which radiate in all directions from this point.

The point at which the writer believes the explosion was initiated is at the open corner of an unventilated rectangular area. This area is about 1100 feet long and 1000 feet wide. It was closed on three sides. On one of the long sides, concrete seals had been built, the other long side was closed by means of wood/^{EN}stoppings and one door; one short side was closed by means of two concrete seals and two wood/^{EN}stoppings. The fourth side had two openings in it, one the aircourse paralleling the 1st left entry, and one a room which had been driven through from 5th right off 1st left to 4th right off 1st left. The long side having concrete seals and the short side with the two openings in it were on intake sides. The area in which the writer believes the explosion was initiated is frequented by the motorman and others for the purpose of defecating.

A very short time before the explosion, the motorman had talked to the outside and indicated in his conversation that he would be near the telephone for some time. The telephone mentioned, was located on the 1st left entry about 100 feet inby the 4th right off 1st left. From the information given the writer, the motorman would have had just about time enough to have reached a point a short distance in the 4th right area, when the explosion was noticed outside. He would have had to have gone through two doors and traveled about 150 feet after telephoning, to have reached this area.

RECOMMENDATIONS

In the interest of safety, the writer offers the following recommendations.

1. That this entire mine be considered as a gassy mine, according to the classification of mines by the Mine Safety Board, which is as follows:

"Class 2 coal mine. - A slightly gassy mine in which --

(a) Inflammable gas has been found, but in amount less than 2 per cent in still air in any active or unsealed-abandoned workings; or

(b) Inflammable gas can be found, but in amount less than 4 per cent, in some place from which the ventilating current has been shut off for a period of one hour; or

(c) Inflammable gas can be found, but in amount less than $\frac{1}{2}$ per cent, in a split of the ventilating current; or

(d) Inflammable gas enters a split of ventilating current at a rate of not more than 25 cubic feet per minute.

Class 3 coal mine. - A gassy mine in which inflammable gas is found in amount greater than specified for a Class 2 coal mine."

2. That competent, qualified, fire bosses be employed and required to carefully examine each working place for gas and unsafe conditions not more than two hours previous to the beginning of every shift. The findings of such examinations to be entered in a book kept on the surface.

3. That all entries, rooms, panels, or sections, that can not be kept well ventilated throughout, or that can not be inspected regularly and thoroughly, or that are not being used for coursing the air,

travel, haulage, or the extraction of coal, be sealed by strong fireproof stoppings.

4. That when sealing is resorted to, care shall be exercised to seal every opening into the area to be sealed.

5. That all seals be hitched into roof, ribs and floor. The hitches to be not less than one foot deep into solid coal, to solid rock in roof and to firm hard bottom. Hitches in roof not less than 6 inches deep, and in floor not less than one foot deep.

6. That the ventilation be carefully studied and such changes be made as will permit the mine being adequately and effectively ventilated; with the necessary fans being located on the surface, thus eliminating the use of booster or auxiliary fans underground.

7. That the ventilating fans be situated out of direct line of forces coming out of the mine, and suitable means be introduced into the fan drifts so as to permit the release of pressures before reaching the fan.

8. That the abandoned areas of the 1st, 2nd, 3rd, and 4th right off the 1st left off 15th right off 12th right off 1st main, be either effectively sealed or properly ventilated. Also, the area of the 12th right between 10th left off 12th right off 1st main and 1st left off 1st left and the area of 1st and 2nd right off 10th left.

9. That every accessible part of the mine be thoroughly rock-dusted whether it be in damp or dry condition. (For detailed specification as to the kind of rock-dust, amount to use, where to be

applied, and method of sampling and testing, see U. S. Bureau of Mines Serial 2606, and American Engineering Standards Committee, "Recommended American Practice for Rock-Dusting Coal Mines," quoted in U. S. Bureau of Mines Information Circular 6030, copies of which are appended.

10. That the rock-dusting be maintained at all times to within 40 feet of every working place.

11. That no person be permitted to have about his person either unlighted or lighted, open flame lamp, while making fire boss inspections, or while traversing abandoned areas in the mine.

12. That only magnetically locked flame safety lamps of a permissible make, be used.

13. That all portable lamps for illumination be permissible electric lamps.

14. That the use of black blasting powder in any form be discontinued, and suitable permissible explosives substituted.

15. That the charging, tamping and firing of all shots should be done by competent shot-firers, after all other persons are out of the mine. (This recommendation is made in the interest of both health and safety of all employees in the mine, as aside from the inherent dangers due to blasting, the air becomes contaminated to a dangerous degree in some instances, with toxic and noxious gases.)

16. That all explosives be delivered into the mine in suitable insulated containers or insulated car, preferably by animal power, at night, and with the power cut off of all trolley lines.

17. That detonators be issued to shot-firers only.

All detonators to be accurately accounted for, and all unused detonators be returned to the point of issuance on the surface.

18. That all electrical equipment used underground be of a permissible type.

19. That when transformers are located underground, they be housed in a strictly fireproof room, the floors of which should be covered with loose sand, gravel, or broken rock, to a depth of at least six inches. The room, or rooms, should be adequately ventilated. The current of air which ventilates them should be taken from fresh intake air and returned into the return air of the mine by a separate split. (When health and safety are concerned, the term "pure intake air" means (a) Air which has not passed through or by, any active workings; and (or) (b) Air which has not passed through or by, any inactive workings unless these are effectively sealed; and (c) Air which is free from poisonous gas and by analysis contains not less than 20 per cent oxygen (dry basis) and not over 0.05 per cent of inflammable gas).

20. That adequate, suitable fire fighting equipment be made easily available, at or near all such underground electrical installations.

21. That all power lines, including trolley and feeder lines be properly hung and substantially supported high enough to obviate contact with equipment passing under them.

22. That all trolley wires be suitably guarded at all points where men are required to pass under them.

23. That efforts be made to have every employee complete

a course of first aid as given by the U. S. Bureau of Mines.

24. That at least ten competent employees be selected and trained in mine rescue work.

25. That a safety organization be formed to function in the interest of the health and safety of the employees.

SUMMARY

It is the common opinion of all who participated in the recovery work and in the investigation, that the explosion was caused by the ignition of an explosive mixture of methane and air and propagated by coal dust.

The point of origin, in the opinion of the Chief Mine Inspector, company officials, and others, was near the face of the 3rd right entry off the 3rd left off 13th right off 12th right off 1st main. It is their opinion that the mixture of methane and air was ignited by the flame of a carbide lamp, carried on the head of the mine foreman, Mr. Hill.

In the opinion of the writer, the point of origin was at a point on the 4th right entry off the 1st left off 13th right off 12th right off 1st main. It is the writer's opinion that the source of ignition was the flame of a carbide light carried by the motorman, whose body was found in the crosscut between the 1st left entry and aircourse just in by the 4th right off 1st left off 13th right off 12th right off 1st main.

In the opinion of the writer, the conditions which led to this disaster, were being reconstructed by the placing of stoppings along the 1st left entry off 13th right off 12th right off 1st main and along the 13th right off 12th right off 1st main and along the 3rd left

off 15th right off 12th right off 1st main. The placing of these stoppings will leave an unventilated and unsealed area in which methane is very likely to accumulate and create a condition, comparable to what, the writer believes, existed just prior to the explosion on March 29, 1930.

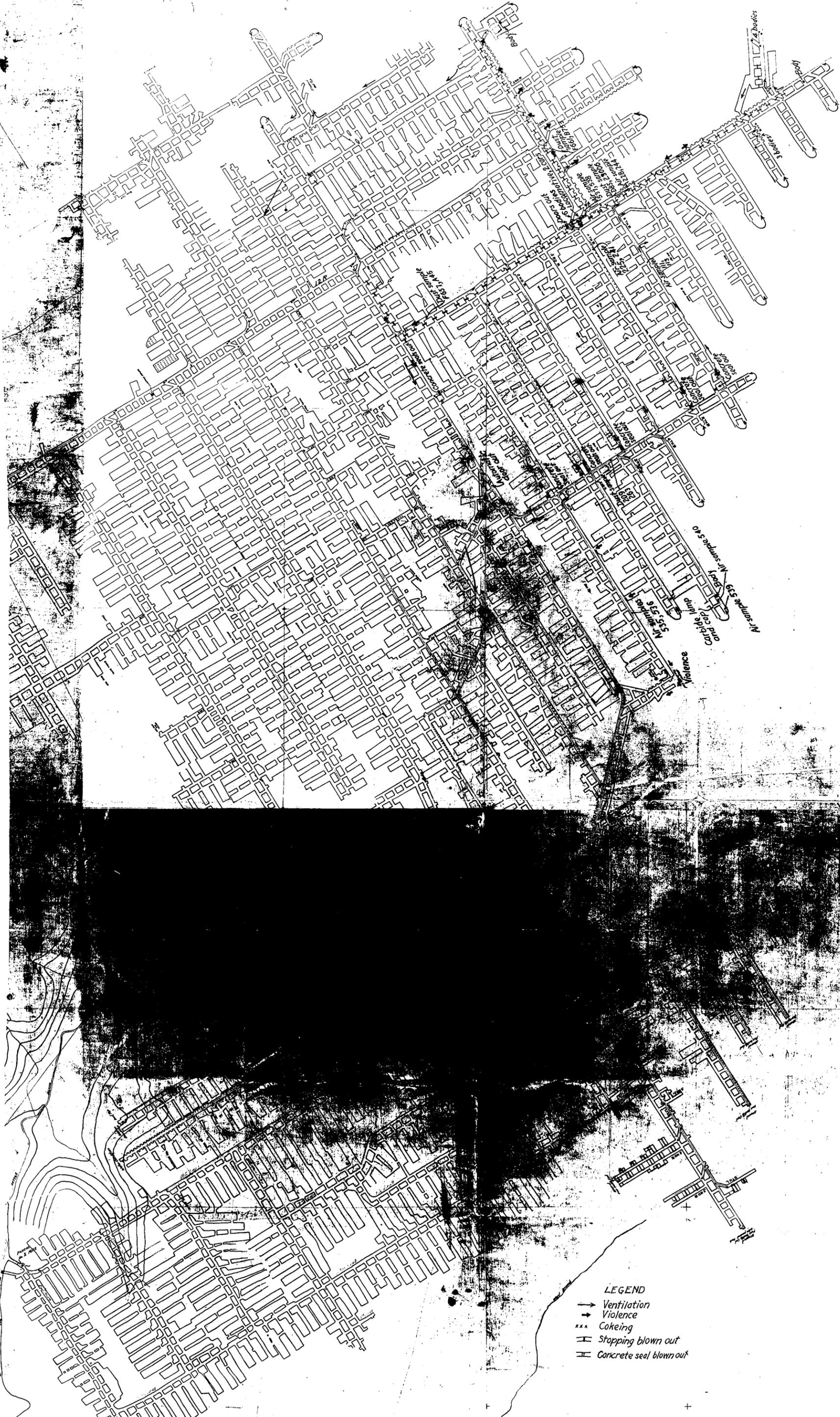
ACKNOWLEDGMENTS

The writer wishes to express appreciation to the company officials and others for their kind cooperation and courteous treatment during the recovery operations and investigation; also to the members of the State Department of Mines for their cooperation.

Respectfully submitted,

Joseph F. Davies

Joseph F. Davies,
Assistant Mining Engineer,
U. S. Bureau of Mines,
Vincennes, Indiana.



- LEGEND
- Ventilation
 - Violence
 - *** Cokeing
 - ⊥ Stopping blown out
 - ⊥ Concrete seal blown out

— PIONEER COAL CO. —
 — MINE N° 1 —
 KETTLE ISLAND-BELL CO.-KY
 SCALE 1/100 MAY 1927

C O P Y



DETAILS OF RESCUE WORK ON EXPLOSION AT KETTLEISLAND

March 29th to April 3, 1930

By J. F. Bryson, Director of Safety,
Harlan County Coal Operators' Association.

The Pioneer Coal Company mine at Kettle Island, Ky., was the scene of a violent explosion at 2:15 p.m. Saturday, March 29, 1930, and sixteen men were entombed. We were notified at Lexington, Kentucky, at 3:40 P.M. the same day and drove to Pineville, a distance of 172 miles, in three hours and twenty-five minutes; then embarked on a special train for the scene of the disaster.

Our first trip into the mine was started at 8:20 PM and the party was composed of J. F. Daniels, Chief Inspector, J. F. Davies, Bureau of Mines Engineer; L. W. Huber, M.S.A. representative; and J. F. Bryson, Director of Safety, Harlan County Coal Operators' Association, together with the rescue team from King Harlan Company, Kildav, Kentucky. This party started off in 2nd Main to learn the extent of the damage done and devise a way to recover the bodies.

By means of the gas masks, this party was able to penetrate to the mouth of 2nd R off 3rd L off 13 R off 13 Right off 1st Main; there they found 3/10 of 1 per cent Carbon Monoxide; Oxygen over 17 per cent.

C O P Y

Returning back to the mouth of 1st L off 2nd Main they there made arrangements to establish a fresh air base and direct activities from that point on 2nd Main side. Returning outside another party composed of L. W. Huber, N.L. Muir, J.F. Bryson and H. E. Grace penetrated 1st main side and were successful in reaching 8 r. off 12 r. off 1st main without detecting C.O. At the Junction of 8 R traces of C.O. was found, oxygen contents normal. Leaving two of the party behind the other two proceeded up 12 r until 12 r off 12 r was reached; considerable evidence of force was found here and the direction pointed towards Drift Mouth. Returning outside the party made a report, and, after studying the situation over, it was decided to fight the explosion from both 1st main and 2nd main sides, with J. F. Davies, Bureau of Mines in charge of 2nd main side and J. F. Bryson, Harlan, Kentucky, in charge of 1st main side. The rescue teams at our disposal were King Harlan Company, Kildav. Kentucky, 2 teams; Black Mountain Corporation, Kenvir, Ky., 2 teams ; Harlan Fuel Company, Yancey, Ky., 2 teams, and Norton and Wilder teams from Norton, Virginia.

Both sides proceeded as rapidly as possible working with safety until 1st main side reached the mouth of 5 r off 1st L off 13 r off 12 r off 1st main, and 2nd main side had reached 1st L off 13 r off 12 r off 1st main, a distance of 1300 feet between the two parties. It was here found that the ventilation was insufficient to proceed any further and arrangements had to be made to increase the velocity. Six bodies were located by

1st main side at the junction of 1st L off 1st L off 13 r off 12 r off 1st main. These bodies were wrapped and brought to the surface, every man having been killed by the violence of the explosion.

A change in ventilation was then made. Previously there had been three fans, one situated at 2nd Main, exhausting; one at 1st Main mouth, exhausting; and one at 16 right off 1st main, auxiliary type. It was decided to stop or seal off 2 r main at Drift mouth, knock out a concrete stopping between the original intake and return. stop 1st main and 16 r off 1st main fans, allowing 1st main and 8 r off 1st main to become the intake and 2nd main the return. This was not a system of reversing the air, it was termed a reversal of air current. We simply made an intake a return and had enlarged the area; with the result that the ventilation was increased 28,000 cubic feet at 1st L off 13 R of 12 R off 1st Main.

When this change was made, 2nd main side was abandoned and the rescue forces were concentrated on 1st main side. The advance was rapidly pushed up 1st left, scanning 6, 7, and 8 right entries without results. There was evidence of a good concentration of CH_4 with about .50 C.O. on 1st L. On 9 R of 1st left three bodies were found. The first was some 80 feet from 1st left entry and this man had been running. Forty feet behind this body the other was located. This man had felt himself being overcome and had placed his bucket down and lay down beside it. In the last crosscut next the entry the third

body was found. It would appear as if he had attempted to get to the aircourse but was overcome.

The rescue party proceeded onwards, building, stopping, as they went until 3rd Main was reached. In this entry four bodies were discovered. From the position of the bodies, it was plain that these men had gathered together after the blast to talk over what method of escape to adopt. Unfortunately they were overcome by C.O. before any action could be taken. The next body was recovered at last crosscut between 1st L and aircourse, this man had died from C.O.

Fourteen bodies had now been recovered and 1st L. and entries to the Right off 1st L were in fresh air. The rescue parties then confined their attention to 1st L off 1st L off 13 R off 12 R off 1st main. The body of the fifteenth man being located in 4 r off 1st L off 1st L off 13 R off 12 R off 1st main.

The whole mine was now practically in fresh air under canvas stoppings, and no trace of the mine foreman's body had been found. From information received from Local officials, it seemed as if he had been trapped in 13th R entry between 2nd Main and 12 R off 1st main. This 13 R entry was gone over inch by inch with no results. The entries off 3 L off 13 R off 12 R off 1st main were then explored and the mine foreman's body found 70 feet from the face in 3rd Right. From the indications of the mine Foreman's body, it showed he had been badly burned and flung with the violence.

In this entry was found the point of ignition, but

C O P Y

at that time no evidence was found as to the cause of ignition. The body being removed, this section was sealed off and on Wednesday, April 9, 1930, the Investigation Committee, composed of J. F. Daniels, Chief Inspector, Frank C. Martin District Inspector, H. E. Grace, Supt. Pioneer Coal Company; F. F. Davies, Assistant Mining Engineer, Bureau of Mines, Vincennes, Indiana, and J. F. Bryson, Director of Safety, Harlan County Coal Operators' Association broke these seals and proceeded to 3rd R entry where they found the mine foreman's cap and carbide lamp. The lamp was still on the cap and at the "on" position. This party found that from the position of the mine foreman's body, cap, and lamp, which were 46' from the body, that Mr. Hill, Mine Foreman, had walked into an explosive mixture of gas with an open flame lamp on his head.

From the information received from various sources, it was shown that Mr. Hill was a competent and skilled mine foreman. From evidence it was shown that ninety per cent of the time he wore an electric cap lamp, which had gone out on him and he had changed to a carbide light. It is thought that Mr. Hill thought he still had his electric light on when he proceeded up this entry with the intention of measuring his air at last crosscut.

In the recommendation made by State Department of Mines, a competent gaseous mine foreman, or in event of ventilation by two fans, two mine foreman, competent Firebosses, shot firers, mine to be rock dusted, electric cap lamps.

C O P Y

If two fans are used concrete seals between mines 5" thick at bottom, 4" thick at top and sunk into rib roof and sides so that separate system of ventilation be maintained.

From the story of this explosion, it is plainly shown that the gas explosion raised the coal dust in suspension and a coal dust explosion followed. Had this mine been properly rock dusted, one life would have been lost, that of the foreman. Had the men been equipped with self rescuers and the mine not rock dusted, it is felt that nine of them could have come out alive, as only the bodies of the mine foreman and the six on 1st L off 13 Right off 12 Right off 1st main had marks of violence on them.

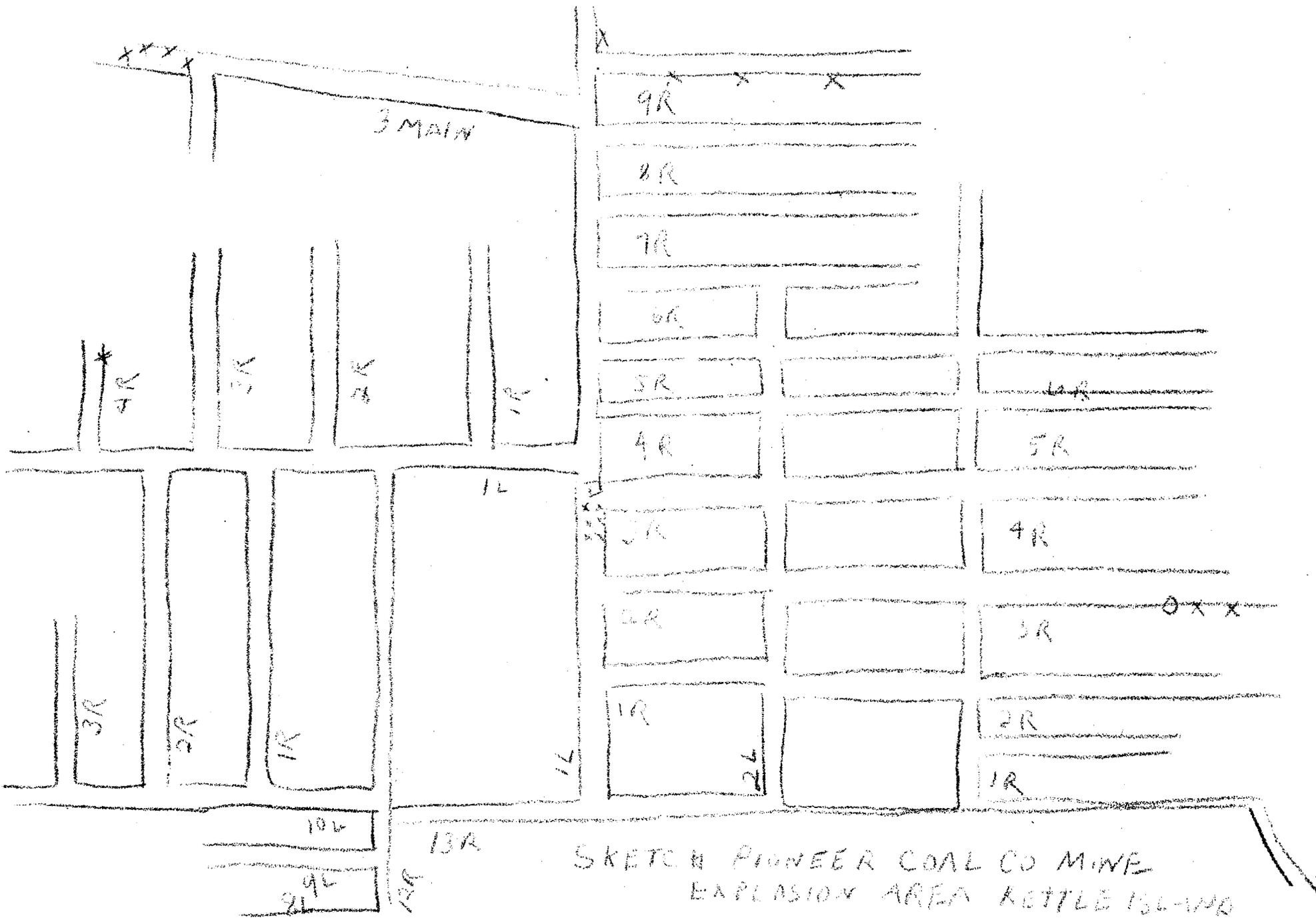
Before concluding it is only right to pay tribute to the rescue teams that took part in this work. The teams that took part in the rescue work were trained rescue men, but had never had any actual experience of work after an explosion. They one and all performed their allotted tasks under the most hazardous conditions like veteran rescuemen. Not a man got sick, not one grumbled; even when they were being driven at top speed, their leaders were proud of them. Harlan County should be proud of them. They proved by their work and ability that what was needed they had and they gave it unselfishly in their endeavor to recover the bodies of these unfortunate men.

The men who led the various parties and took charge of shifts under Davies and Bryson are also worthy of anything that can be said of them. In L. W. Huber and N. L. Muir, M.S.A. Company, we had to capable men who gained the confidence and esteem of everyone concerned.

J.J. Snure, Supt., Black Mountain Corporation, Kenvir, Ky, deserves commendation for his wonderful leadership. W.T. Lacy, Blue Diamond Coal Company; E. H. Graff, Bureau of Mines, Norton, Virginia, N.L. Mowery, Bureau of Mines, Jellico, Tenn. S.C. Shaffer, U.S. Coal & Coke Co., Lynch, Kentucky, William Palmer, Wisconsin Steel Company, Benham, Kentucky, Joseph Sheeder, Pikeville, Kentucky, all deserve praise for the work they performed. While it is commendable what these leaders did in this emergency, we must in justice to the work of J.F. Davies, Assistant Mining Engineer, U.S. Bureau of Mines, Vincennes, Indiana, recognize in him a man of rare attainments, unflinching judgment, and hearty cooperation when it comes to the difficulties experienced under ground in a disaster of this kind.

The attached rough drawn sketch will give the reader some idea of the places referred to. Where the bodies were found are marked with a cross; square block, motor, O point of ignition; star, mine foreman's cap.

The entire rescue work, of course, came under the general supervision of Mr. J.F. Daniel, Chief Inspector of Mines, State of Kentucky, and my report to you would not be complete unless I acknowledged the wonderful assistance given by Chief Danile in the work done.



SKETCH PIONEER COAL CO MINE
 EXPANSION AREA KETTLE ISLAND

PATRONS ARE REQUESTED TO FAVOR THE COMPANY BY CRITICISM AND SUGGESTION CONCERNING ITS SERVICE

CLASS OF SERVICE

This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable sign above or preceding the address.

WESTERN UNION

NEWCOMB CARLTON, PRESIDENT

J. C. WILLEVER, FIRST VICE-PRESIDENT

SIGNS

- DL = Day Letter
- NM = Night Message
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- NLT = Cable Letter
- WEL = Week-End Letter

The filing time as shown in the date line on full-rate telegrams and day letters, and the time of receipt at destination as shown on all messages, is STANDARD TIME.
Received at Chamber of Commerce Bldg., Cor. 7th. Ave. & Smithfield St., Pittsburgh, Pa. 1930 MAR 29 PM 5 0

JB449 19 GOVT COLLECT=LEXINGTON KY 29 344P

UNITED STATES BUREAU OF MINES, ATTN J J FORBES=
4800 FORBES ST PITTSBURGH PENN=

RECEIVED
BUREAU OF MINES
FOUR
APR 1 1930
RECEIVED

EXPLOSION KETTLE ISLAND BELL COUNTY SIX MEN ENTOMBED DAVIES
GRAFF AND MOWERY ENROUTE STOP WILL ADVISED DETAILS LATER=
DAVIES.

Recd 5:31 PM 3/29
VH 820A
MA 4500
B.H.
WE 9414
MAIL-
REMITTANCE
RB. covered untd

WPT (M)
Mld. fore & refone in A.M.
shiding

DA 832A 55

THE QUICKEST, SUREST AND SAFEST WAY TO SEND MONEY IS BY TELEGRAPH OR CABLE

Western Union Telegraph Co.
Lexington, Ky. March 30th 1930.
J. J. Forbes, Bureau of mines.
Explosion Kettle Island, Bell, Co.,
6 men entombed, Davies, Graff, and
Mowery enroute. Will advise later.
Signed, Davies.

Received 9:45, Repeated to Mr. Forbes and
Mr Grove, Hamilton.

1111

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WESTERN UNION

NEWCOMB CARLTON, PRESIDENT

J. C. WILLEVER, FIRST VICE-PRESIDENT

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Received at Chamber of Commerce Bldg., Cor. 7th Ave. & Smithfield St., Pittsburgh, Pa. 1930 MAR 30 PM 11 27

JB324 17 COLLECT 3 EXTRA GOVT 32 CENTS. PINEVILLE KY VIA

US BUREAU OF MINES=

APR - 7 1930

CUMBERLAND GAP TENN 30

4800 FORBES ST PITTSBURGH PENN=

SIXTEEN MEN ENTOMBED IN KETTLE ISLAND MINE RECOVERY

INDEFINITE ACCOUNT INADEQUATE VENTILATION ADVISE WASHINGTON=

DAVIES.

Recd 11:55 PM
3/30

Handwritten notes:
 JJJ-4500
 UH 851A (initials)
 REFOUNDED & REFOUNDED IN AM

THE QUICKEST, SUREST AND SAFEST WAY TO SEND MONEY IS BY TELEGRAPH OR CABLE

DA 832A 55

STANDARD FORM No. 14A
 APPROVED BY THE PRESIDENT
 MARCH 10, 1926

TELEGRAM

OFFICIAL BUSINESS—GOVERNMENT RATES

GOVERNMENT PRINTING OFFICE 11-9107

CHECK SERVICE DESIRED

Day Letter
Night Message
Night Letter
Fast Day Message

IF MESSAGE IS TO WASHINGTON, D. C.,
 SEND COLLECT

OTHERWISE CHARGE
 U. S. BUREAU OF MINES Pittsburgh, Pa.
 (Station)

Sent by J. J. Forbes
 Title Supervising Engineer
 Place Pittsburgh Pa
 Date March 31, 1930 JJF:FF

Mr. D. Harrington,
 U. S. Bureau of Mines,
 Washington, D. C.

Davies wires "sixteen men entombed Kettle Island Mine ,
 Bell County, Kentucky. Recovery indefinite account of inadequate
 ventilation."

Forbes

Phoned W. U. 9:30 a.m. 3/31/30 by F.F.

CLASS OF SERVICE

This is a full-rate Telegram or Cablegram unless its deferred character is indicated by a suitable sign above or preceding the address.

WESTERN UNION

NEWCOMB CARLTON, PRESIDENT

J. C. WILLEVER, FIRST VICE-PRESIDENT

SIGNS

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Received at Chamber of Commerce Bldg., Cor. 7th Ave. & Smithfield St., Pittsburgh, Pa. 1930 MAR 31 PM 4 15

JB455 13 COLLECT-KETTLEISLAND KY 31 257P

J J FORBES=

BUREAU OF MINES PITTSBURGH PENN=

WILL WIRE DETAILS LATE TODAY OR FIRST THING IN MORNING

PROGRESS SLOW=

DAVIES.

BUREAU OF MINES
PITTSBURGH, PA.
APR - 1 1930
RECEIVED

D-

Recd 4:20 PM
3/31

MA

*4500 MA 8207
UP 4/18 med*

THE QUICKEST, SUREST AND SAFEST WAY TO SEND MONEY IS BY TELEGRAPH OR CABLE

STANDARD FORM NO. 14A
APPROVED BY THE PRESIDENT
MARCH 10, 1926

TELEGRAM

OFFICIAL BUSINESS—GOVERNMENT RATES

GOVERNMENT PRINTING OFFICE 13-0107

CHECK SERVICE DESIRED

IF MESSAGE IS TO WASHINGTON, D. C.,
SEND COLLECT

OTHERWISE CHARGE

U. S. BUREAU OF MINES Pittsburgh
(station)

Sent by J. J. Forbes

Title Supervising Engineer

Place Pittsburgh Pa

Date March 31 1930 JJF:FF

- Day Letter
- Night Message
- Night Letter
- Fast Day Message

Mr. C. A. Herbert,
U. S. Bureau of Mines,
418 LaPlante Bldg.,
Vincennes, Ind.

Think it advisable that Davies remain Kettle Island to make investigation after recovery work completed. Wire this office and Washington progress recovery work as soon as possible.

Forbes

Phoned W.U. 9:30 a.m. 3/31/30 by F. F.

CC-D. Harrington
File

MA

D-

TELEGRAM

OFFICIAL BUSINESS—GOVERNMENT RATES

GOVERNMENT PRINTING OFFICE 11-9107

CHECK SERVICE
DESIRED

Day Letter
Night Message
Night Letter
Fast Day Message

IF MESSAGE IS TO WASHINGTON, D. C.,
SEND ~~COLLECT~~

OTHERWISE CHARGE
U. S. BUREAU OF MINES Pittsburgh, Pa.

(Station)

Sent by J. J. Forbes
 Title Supervising Engr., Instruction Sec.
 Place Pittsburgh, Pa.
 Date March 31, 1930. JJJ:mcs

Mr. D. Harrington,
U. S. Bureau of Mines,
Washington, D. C.

Wire received from Davies 4:20 this afternoon from Kettle Island
"Will wire details late today or first thing in morning. Progress
slow."

Forbes

Gov't rate collect message phoned to W.U. at 4:38 p.m. 3/31/30 by mcs.

D /

TELEGRAM

OFFICIAL BUSINESS—GOVERNMENT RATES

GOVERNMENT PRINTING OFFICE 11-9107

CHECK SERVICE
DESIRED

Day Letter
Night Message
Night Letter
Fast Day Message

IF MESSAGE IS TO WASHINGTON, D. C.,
SEND COLLECT

OTHERWISE CHARGE
U. S. BUREAU OF MINES Pittsburgh, Pa.

(Station)

Sent by J. J. Forbes
 Title Supervising Engr., Instruction Sec.
 Place Pittsburgh, Pa.
 Date March 31, 1930. JJJ:mcs

Mr. J. F. Davies,
U. S. Bureau of Mines,
c/o Pioneer Coal Co.,
Kettle Island, Kentucky.

In all your wires make sure that Washington Office receives information
on Kettle Island explosion. No wires received from you indicate
whether or not you have sent Washington Office copies.

FORBES

Gov't rate paid message phoned to W.U. 4:38 p.m. 3/31/30 by mcs.

D /

cc - D. Harrington
Files

7

Postal Telegraph

(THE MACKAY SYSTEM)



ALL AMERICA CABLES

COMMERCIAL CABLES

RECEIVED AT

STANDARD TIME
INDICATED ON THIS MESSAGE

This is a full rate Telegram or Cablegram unless otherwise indicated by signal in the check or in the address.

BLUE	DAY LETTER
NL	NIGHT LETTER
NITE	NIGHT MESSAGE
LCO	DEFERRED CABLE
NLT	NIGHT CABLE LETTER
WLT	WEEK END CABLE LETTER

NA34 13 GOVT COLLECT

141 TD BIRMINGHAM ALA 30 650 A

J J FORBES

Bureau of Mines

4800 FORBES ST PITTSBURGH PENN



ASSUME HERBERT DISTRICT WILL INVESTIGATE CATTLEISLAND EXPLOSION

BUT IF NOT ADVISE QUICK
THIS TELEGRAM
WAS TELEPHONED CASH.

TO: *Mr Taylor*
BY: *Match 31*
AT: *8:40* M. DATE

Ma 4500 advise call at 8:30 a

Office m
THIS TELEGRAM
WAS TELEPHONED
TO: *Mr Taylor*
BY: *Match 31*
AT: *8:40* M. DATE

ask

Ma 4500 Nathan advise

ask Ha 53/5

advised to cable
Ma 6573 R

Recd 8:40 AM 3/31

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WESTERN UNION

NEWCOMB CARLTON, PRESIDENT

J. C. WILLEVER, FIRST VICE-PRESIDENT

SIGNS

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Received at Chamber of Commerce Bldg., Cor. 7th. Ave. & Smithfield St., Pittsburgh, Pa. 1930 APR 1 AM 2 06

JB27 14 NM COLLECT GOVT-HARLAN KY 31

US BUREAU OF MINES-

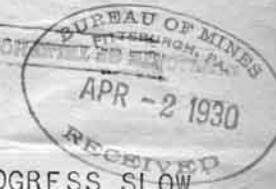
4800 FORBES ST PITTSBURGH PENN-

65

SIX BODIES FOUND STOP TEN MISSING YET STOP PROGRESS SLOW

ACCOUNT INADEQUATE VENTILATION-

DAVIES.



Recd 8:45 AM 4/1

4500 ma
LEMP TO
VA 850A mld
changes

THE QUICKEST, SUREST AND SAFEST WAY TO SEND MONEY IS BY TELEGRAPH OR CABLE

TELEGRAM

OFFICIAL BUSINESS—GOVERNMENT RATES

GOVERNMENT PRINTING OFFICE 11-9107

CHECK SERVICE
DESIRED

<input type="checkbox"/>	Day Letter
<input type="checkbox"/>	Night Message
<input type="checkbox"/>	Night Letter
<input checked="" type="checkbox"/>	Fast Day Message

IF MESSAGE IS TO WASHINGTON, D. C.,
SEND COLLECT

OTHERWISE CHARGE
U. S. BUREAU OF MINES Pittsburgh
(Station)

Sent by J. J. FORBES
 Title SUPERVISING ENGINEER
 Place PITTSBURGH PENNSYLVANIA
 Date APRIL 1 1930

D HARRINGTON
U S BUREAU OF MINES
WASHINGTON D C

D-

DAVIES WIRES THIS MORNING FROM HARLAN KENTUCKY QUOTE SIX BODIES FOUND STOP
TEN MISSING STOP PROGRESS SLOW ACCOUNT INADEQUATE VENTILATION UNQUOTE

FORBES

Phoned W.U. 10 a.m. 4/1/30 by ies

CC-Files ✓

PATRONS ARE REQUESTED TO FAVOR THE COMPANY BY CRITICISM AND SUGGESTION CONCERNING ITS SERVICE

12018

CLASS OF SERVICE

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WESTERN UNION

NEWCOMB CARLTON, PRESIDENT

J. C. WILLEVER, FIRST VICE-PRESIDENT

SIGNS

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Received at Chamber of Commerce Bldg., Cor. 7th. Ave. & Smithfield St., Pittsburgh, Pa.

JB90 25 GOVT COLLECT-KETTLEISLAND KY 1 8 41A 1930 APR 1 AM 9 41

J J FORBES-

4800 FORBES ST PITTSBURGH PENN-

BUREAU OF MINES
PITTSBURGH, PA.
APR - 2 1930
RECEIVED

SIX BODIES RECOVERED MONDAY NIGHT STOP FOUND WITHIN 100 FEET
OF EACH OTHER STOP VENTILATION POOR CAUSING DELAY STOP STAY
HERE INDEFINITE-

MOWERY.

Handwritten notes:
 4-20 MA
 To 9400
 x chgo
 E.P. NOTD

Handwritten: Recd 9:45 AM 4/1

Handwritten: D-

100

CLASS OF SERVICE

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WESTERN UNION

NEWCOMB CARLTON, PRESIDENT

J. C. WILLEVER, FIRST VICE-PRESIDENT

SIGNS

- DL = Day Letter
- NM = Night Message
- NL = Night Letter
- LCO = Deferred Cable
- NLT = Cable Letter
- WLT = Week-End Letter

The filing time as shown in the date line on full-rate telegrams and day letters, and the time of receipt at destination as shown on all messages, is STANDARD TIME.

Received at Chamber of Commerce Bldg., Cor. 7th Ave. & Smithfield St Pittsburgh, Pa.

JB619 10 GOVT COLLECT-PINEVILLE KY 1 559 930 APR 1 PM 7 17

U S BUREAU OF MINES=
PITTSBURGH PENN=

BUREAU OF MINES
PITTSBURGH, PA.
APR - 3 1930
RECEIVED

SIX BODIES RECOVERED TEN STILL MISSING EXPECT BETTER
PROGRESS=

DAVIES.

*Recd 8:50 AM
4/2*

*Proa 4500p J.H.B.
7781*

med fore & refore in a.m. U.C.

*E.W.T. RPL
4/1/30 857A
Mand*

THE QUICKEST, SUREST AND SAFEST WAY TO SEND MONEY IS BY TELEGRAPH OR CABLE

STANDARD FORM No. 14A
APPROVED BY THE PRESIDENT
MARCH 10, 1926

TELEGRAM

OFFICIAL BUSINESS—GOVERNMENT RATES

GOVERNMENT PRINTING OFFICE 11-9107

CHECK SERVICE
DESIRED

- Day Letter
- Night Message
- Night Letter
- Fast Day Message

IF MESSAGE IS TO WASHINGTON, D. C.,
SEND COLLECT

OTHERWISE CHARGE
U. S. BUREAU OF MINES _____

(Station)

Sent by..... **J-J FORRES**

Title..... **SUPERVISING ENGINEER**

Place..... **PITTSBURGH PA**

Date..... **APRIL 2 1930**

JJF:IS

D HARRINGTON
U S BUREAU OF MINES
WASHINGTON D C

DAVIES WIRES LATE LAST NIGHT FROM PINEVILLE KENTUCKY QUOTE SIX BODIES
RECOVERED TEN STILL MISSING EXPECT BETTER PROGRESS UNQUOTE

FORRES

Phoned W. U. 9 a.m. 4/2/30 by ies

CC-Files ✓

CLASS OF SERVICE

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WESTERN UNION

NEWCOMB CARLTON, PRESIDENT

J. C. WILLEVER, FIRST VICE-PRESIDENT

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 Received at Chamber of Commerce Bldg., Cor. 7th. Ave. & Smithfield St., Pittsburgh, Pa.

JB110 11 GOVT COLLECT-KETTE ISLAND KY 2 857A

US BUREAU OF MINES=
 PITTSBURGH PENN=

BUREAU OF MINES
 PITTSBURGH, PA.
 OF TELEPHONED TELEGRAMS
 APR - 3 1930
 RECEIVED

TEN BODIES YET IN MINE EXPECT COMPLETE RECOVERY THIS EVENING

J F DAVIES.

MA 4/5-00

No.	G. W. G.
Rate	10210 med
Charge	

*Rec'd 10:25 AM
 4/2*

D-

THE QUICKEST, SUREST AND SAFEST WAY TO SEND MONEY IS BY TELEGRAPH OR CABLE

CLASS OF SERVICE DESIRED	
DOMESTIC	CABLE
TELEGRAM	FULL RATE
DAY LETTER	DEFERRED
NIGHT MESSAGE <input checked="" type="checkbox"/>	CABLE LETTER
NIGHT LETTER	WEEK END LETTER

Patrons should check class of service desired; otherwise message will be transmitted as a full-rate communication.

WESTERN UNION

NEWCOMB CARLTON, PRESIDENT

J. C. WILLEVER, FIRST VICE-PRESIDENT

1206-A

NO.	CASH OR CHG.
CHECK	
TIME FILED	

Send the following message, subject to the terms on back hereof, which are hereby agreed to

Pineville, Kentucky.
 April 3, 1930.

U. S. Bureau of Mines.

Kettle Island will be cleaned up tonight. Davies will remain.

Will be Norton Friday afternoon.

Graff.

Rec'd and phoned to Miss Jex
 8:45 a.m. 4-4-30 by ee

Orig. to Mr. Forbes
 cc to Mr. Edw. Taylor

MA 4/4/30

THE QUICKEST, SUREST AND SAFEST WAY TO SEND MONEY IS BY TELEGRAPH OR CABLE

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Received at Chamber of Commerce Bldg., Cor. 7th. Ave. & Smithfield St., Pittsburgh, Pa.

1930 APR 4 AM 10 05

JB108 ~~16~~ GOVT COLLECT=KETTLEISLAND KY 4 853A

20-494
US BUREAU OF MINES=

4800 FORBES ST PITTSBURGH PENN=



RECOVERY WORK AT KETTLEISLAND KY PIONEER COAL CO MINE

COMPLETED TIME OF INVESTIGATION NOT DECIDED=

DAVIES.

Handwritten notes:
 4500 EE
 OK to charge
 [Signature]

Handwritten notes:
 D-
 Recd 10:12 AM
 4/4

THE QUICKEST, SUREST AND SAFEST WAY TO SEND MONEY IS BY TELEGRAPH OR CABLE

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Received at Chamber of Commerce Bldg., Cor. 7th. Ave. & Smithfield St., Pittsburgh, Pa.

1930 APR 4 AM 11 2

JB200 12 GOVT COLLECT=PINEVILLE KY 4 1005A

J J FORBES=

4800 FORBES ST PITTSBURGH PENN=



LAST BODY REMOVED ABOUT TWO OCLOCK THIS MORNING LEAVING FOR

JELLICO=

MOWERY..

Handwritten notes:
 4500 MA 33
 By [Signature] 11299 [Signature]

Handwritten notes:
 Recd 11:30 AM
 4/4
 D-

THE QUICKEST, SUREST AND SAFEST WAY TO SEND MONEY IS BY TELEGRAPH OR CABLE

STANDARD FORM NO. 14A
APPROVED BY THE PRESIDENT
MARCH 10, 1926

TELEGRAM

OFFICIAL BUSINESS—GOVERNMENT RATES

GOVERNMENT PRINTING OFFICE 11-9107

CHECK SERVICE
DESIRED

Day Letter
Night Message
Night Letter
Fast Day Message

IF MESSAGE IS TO WASHINGTON, D. C.,
SEND COLLECT

OTHERWISE CHARGE Pittsburgh
U. S. BUREAU OF MINES (Station)

Sent by J. J. Forbes
 Title Supervising Engineer
 Place Pittsburgh, Pa.
 Date April 4, 1930. JJF:LJ

D. Harrington
U. S. Bureau of Mines
Washington, D. C.

Davies wires quote Recovery work of Kettle Island Kentucky, Pioneer
Coal Company mine completed Time of investigation not decided unquote.

Forbes

Phoned to W. U. 4/4/30 at 10:30 a.m. LJ

CC Files ✓

PATRONS ARE REQUESTED TO FAVOR THE COMPANY BY CRITICISM AND SUGGESTION CONCERNING ITS SERVICE

12018

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WESTERN UNION

NEWCOMB CARLTON, PRESIDENT

J. C. WILLEVER, FIRST VICE-PRESIDENT

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Received at Chamber of Commerce Bldg., Cor. 7th Ave. & Smithfield St., Pittsburgh, Pa.

NDA159 24 GOVT=VINCENNES IND 3 155P

J J FORBES, US BUREAU MINES=

4800 FORBES ST PITTSBURGH PENN=

APR -4 1930
RECEIVED
1930 APR 3 PM 3 12

DAVIES ADVISES ALL BODIES RECOVERED EXCEPT ONE KETTLEISLAND
EXPLOSION STOP INDEFINITE WHEN MISSING MAN WILL BE FOUND
STOP VENTILATION COMPLETELY RESOTRED TEMPORARILY WASHINGTON
ADVISED=

VANLIEU.

MA 4/4/30

Rec'd 3:15 PM
4/3

D-

No 4500 MA GOVT.
BY 3/198 mail

THE QUICKEST, SUREST AND SAFEST WAY TO SEND MONEY IS BY TELEGRAPH OR CABLE

PATRONS ARE REQUESTED TO FAVOR THE COMPANY BY CRITICISM AND SUGGESTION CONCERNING ITS SERVICE

1201 8

CLASS OF SERVICE

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WESTERN UNION

NEWCOMB CARLTON, PRESIDENT

J. C. WILLEVER, FIRST VICE-PRESIDENT

SIGNS

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- NLT = Cable Letter
- WLT = Week-End Letter

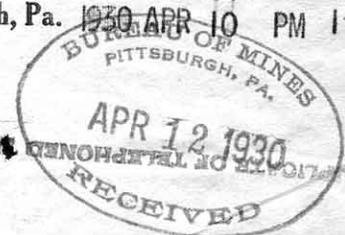
The filing time as shown in the date line on full-rate telegrams and day letters, and the time of receipt at destination as shown on all messages, is STANDARD TIME.

Received at Chamber of Commerce Bldg., Cor. 7th Ave. & Smithfield St., Pittsburgh, Pa. 1930 APR 10 PM 11:00

JB688 8 GOVT NM COLLECT=PINEVILLE KY 10

U S BUREAU OF MINES=

6 4800 FORBES ST PITTSBURGH PENN=



PIONEER MINE INVESTIGATION COMPLETED ENROUTE VINCENNES, TONIGHT

DAVIES.

Mr. Forbes

MA

*Recd 9:05 AM
4/11*

*4500 ma
E.E. (RPTD)
9:04A MLD*

*SH
Chgs OK*

THE QUICKEST, SUREST AND SAFEST WAY TO SEND MONEY IS BY TELEGRAPH OR CABLE

FIVE DUND

POISON AIR SLOWS WORK TO GET MORE

Heavy Curtain of Carbon Monoxide Within 200 Feet of Where Men Died.

TRAIN AWAITING BODIES

Some of Mine Rescue Workers Begin to Feel Effects of Of Deadly Gas.

Special To The News-Sentinel

KETTLE ISLAND, Ky. — The bodies of five miners, killed in the explosion in the mine of Pioneer Coal Company Saturday afternoon were found today.

John S. Daniel, chief of the Kentucky Department of Mines, advised that rescue crews had located the five bodies, but that they were not identified and could not be brought to the surface, on account of the condition of the poison gases in that part of the mine.

No Traces of Life

The men were examined for traces of life and the rescue workers then were forced to come out.

The 11 other bodies are expected to be reached by Wednesday, at the latest, the delay being due to the condition within the mine. Work of advancing is greatly hampered by the accumulation of debris, due to the force of the explosion. An abundance of monoxide has prevented a rapid advance, even with gas masks.

L. & N. Train Waiting

Daybreak found friends and relatives of the entombed men still at the mouth of the mine, straining their eyes to see the first flash of the motor headlight emerging from the darkness of the pit.

An L. & N. train, placed at the disposal of the coal company by H. C. Davis, master of trains, was in readiness at all times to receive the injured men or their bodies as soon as they were brought out.

All Hope Abandoned

All hope had been abandoned, however, during the night that any of the men would be found

alive.

Workers were forced to discontinue their trips into the heavily laden carbon monoxide regions until the fans had cleared up the air a little more. Some of the men were beginning to feel the effects of staying in the poisoned air so long, even in their gas masks, and Director Daniel decided to give the men a momentary rest while awaiting the action of the fans.

Brattice Work Finished

The final brattice work was completed in the main entry and up to within about 200 feet of where the men were working at the time of the explosion. Efforts to penetrate this heavy curtain of carbon monoxide were unavailing and the leaders realized that to remain in this air a minute overtime might have fatal results. ●

Take Bodies to Pineville

Plans were complete to take the men's bodies direct to Pineville, seven miles from here, in the event life was snuffed out in the explosion which rocked the mines Saturday afternoon. They were to be taken out of the mines in motors and rushed alongside the baggage car, then taken to Pineville for preparation for burial.

16 GIVEN UP AS DEAD IN EXPLOSION

Trapped Mile and A Half Down In Pioneer Coal Company Mine at Kettle Island, Near Pineville, Ky., Saturday.

FIRST TO RESCUE ARE OVERCOME

Volunteers Who Started to Aid Without Gas Masks Have to Be Resuscitated; Terrific Gas Blast Shatters Timbers.

By JOHN T. MOUTOUX
News-Sentinel Staff Correspondent

PINEVILLE, Ky.—Sixteen men were trapped a mile and a half down in Entry No. 12 of Pioneer Coal Company mine at Kettle Island, seven miles northeast of Pineville, following a gas explosion Saturday afternoon.

Early Sunday no hope was held that any of the men would be found alive. Mine rescue crews by then with gas masks had gone more than 4000 feet into the mine.

A rescue crew, with John H. Daniels, chief state inspector in charge, came out of the mine at 12:30 a. m., Sunday. They had gone 4000 feet without finding any bodies, and believe that the 16 men must have been trapped 10,000 feet back.

A supply men's base was established 400 feet in. Mine cars were going in and out of the mine, carrying material to put up brattices.

As one crew comes out of the mine another goes in. A crew from Pineville was at the mine early Sunday to go in.

The explosion occurred Saturday at 2:30 p. m. Immediately afterwards mine rescue crews in the coal fields were notified and preparations were started to rush equipment by special trains.

Gas Halts First Volunteers

Lowe Kuhn with four volunteers first tried to go into the mine. They had no gas masks and were almost overcome by black damp and gas. The five crawled out and were resuscitated.

At 3:30 p. m. rescue men arrived from Harlan, Jellico and Lexington. Two of these started into the mine without gas masks and had gone only 100 feet when they fell down. Others brought the two out and resuscitated them.

The fact that the men without masks could go only a short distance indicated that the 16 more than a mile back in the mine must be dead.

Another crew from Norton, Va., arrived at 10:30.

Timbers and Brattices Broken

The terrific explosion broke timbers and brattices which were barriers to the progress of rescue crews.

A rescue crew of 12 from Kilday went in at 9:45. They found the mine entry virtually shattered and did not believe that anyone could have survived the explosion.

Five officials of the U. S. Bureau of Mines are taking part in the rescue work. John H. Daniels of Lexington, state mine inspector, is also helping.

Coal operators were joining with miners in doing what they could. E. R. Clayton, secretary of the Harlan County Coal Operators' Association, went to the mine.

Miners were huddled in groups around bonfires. Relatives waited hopefully under a shed for news from the rescue workers.

There was no lack of mine experts as a convention of them was being held at Lexington and they came over to help in the rescue.

L. & N. special trains took rescue equipment to the scene of the disaster. Dr. H. C. Davison of Middlesboro, master of trains, was in charge.

The Pioneer Coal Company mine at Kettle Island is the second largest in southeastern Kentucky.

Ambassador Is An Owner

The company is owned by Fred M. Sackett, former Kentucky senator and now United States Ambassador to Germany, and by J. E. Speed of the Fulton Speed Cement Company, Louisville, Ky. They also own the Black Star mine in Harlan county and the Wilton mines in Knox county, Ky.

The mine is non-union and there has been no strike since 1922. Wages have been satisfactory.

More miners would probably have been killed if the explosion had not taken place Saturday afternoon. Usually 275 men are at work in the mine, but most of them quit work at noon on Saturdays. One of the men killed was a foreman and another was an assistant foreman.

The last explosion at the mine was two years ago when a foreman was killed.

16 BELIEVED DEAD

The 16 men entombed and now believed dead in the mine explosion at Kettle Island, 85 miles northeast of Knoxville, are:

J. E. Hill, foreman.
M. J. Vann, assistant foreman.
J. L. Jones, coal loader.
Jess Lasley, coal loader.
Dave Sowers, coupler.
Mason Fultz, timberman.
Luther Hodge, motorman.
Edd Osborne, coupler.
Harvey Allen, coal loader.
Elmer Steele, coal loader.
John L. Cox, coal loader.
John Engle, coal loader.
Lee Johnson, coal loader.
Adrian Helton, coal loader.
Raymond Simpson, coal loader.
Sam Proffitt, brattice man.

WHERE 16 MEN WERE TRAPPED

Former Worker in Kettle Island Mine Tells of Detecting Gas and Losing Job; Business of Attempt a Rescue Described.

By JOHN T. MOUTOUX

IT IS Saturday night in the railway station at Pineville, Ky. The waiting room is crowded with men. They're all waiting to go to Kettle Island, where 16 men are trapped in a mine.

"I used to work in that mine," a man tells me. "It had a lot of gas in it and not enough air. I lost my job proving it. One day, when the mine foreman was along, I struck a match. I knew there was some gas where we were. There was a small fire—not enough to hurt anybody—but it proved my point. I was fired. Two years later that same foreman was killed in that same mine. He went in early one morning on an inspection trip. Nobody else was with him, and so only he was killed."

Rescue Men There

MANY of the men in the waiting room are members of mine rescue crews. There are also a lot of officials—federal and state mine inspectors, safety engineers of surrounding coal companies, and coal mine officials.

The L. & N. train master explains that he's waiting on the rescue crew from Norton, Va. Meanwhile, one of the baggage cars is being loaded with brattice cloth, oxygen tanks, gas masks, c. o. detectors, batteries and other equipment for the rescue work.

The crew from Norton, Va., arrives. The man in charge has a talk with other officials and announces that he's going to take the crew to the Pineville hotel at Pineville. "You've got plenty men up there for tonight," he said, "and tomorrow they'll be fagged out. You'll need men who've had some sleep."

Town Deserted

AFTER a 20 minutes ride in the dark between ridges of mountains that press down on all sides we see a lot of houses. It is Kettle Island.

The lighted, the houses do not seem to have any occupants. The anxious inhabitants are at the mine. It is three-quarters of a mile to the mine entrance. Soon the train stops and we get out. The L. & N. trainman tells us to go with him. It is dark but he has a flashlight.

We climb down the track embankment and are in a sort of cove. The cove is dotted with bonfires. There are more than a half-dozen of them and a big crowd is around each one. Most of them are men.

We approach a building filled with women and children.

"That's always the saddest sight at a thing like this," says the train master, who has been at many mine disasters. "They're the wives and children of the trapped men."

There is much walling inside and we are glad to get by.

At Mine Entrance

THE entry to the mine looks innocent enough. Just a hole into the side of the mountain. It is about six feet wide and four or five feet high. There's not a thing to indicate that something has gone wrong inside.

One of the men comes up. He has charge of the fan which draws the bad air. In any mine the good air comes in thru the main entrance or entry and the used air is sucked out by a pump, thus causing a continuous circulation of air.

"The first we knew about it," the man said, "was when the fan stopped."

That is usually what happens in a mine blast. Just when air circulation is most needed the fan stops and the poisonous air stays in the mine.

Getting Ready to Enter

WE GO back to the train. The inspectors and officials are now in the baggage car. A plank leads from another track to the sill of the door in the baggage car. The door is shut to keep out the cold but a man at the door keeps opening and closing it as a steady line goes in and out.

"Are you a member of the team?" the man at the door asks. The man says he is and is admitted.

The car is filled with men who are sitting on the floor. Those who have just come in from outside are around the stove. Coffee is boiling on the stove. Pot after pot is emptied.

"Team No. 2 get ready to go in," says one of the officials.

Some dozen men get up and come to the end of the car where the equipment is kept. Each man is given a white cap and a gas mask. The equipment is all new. The cap is white. On front of it is attached an electric light. A wire leads from the light down the back of the man to a can about five inches wide, six inches high and two inches thick. The can contains the batteries. The can is strapped on his back.

He wears another can on his chest which contains chemicals for the gas mask. A hose about an inch and a quarter thick leads from the snoot of the

mask down to this can.

Team No. 2 is ready to relieve team No. 1, which went in at 9:30. It is now 11:30.

They wait and wait.

"It's a good sign," says one of the inspectors. "They could not stay in so long if the air was bad." The chemical in the gas mask is good for two and a half hours.

Team Is Depressed

AT 12:30 team No. 1 comes out. They were the first to penetrate the mine any distance since the blast and their information is eagerly awaited.

The team members seem depressed. I try to talk to one of them but he won't talk. The head of the team has a talk with one of the officials. About a dozen of the men in the car, including most of those in charge, file out of the baggage car.

"They're going to the map room," someone says.

The inspectors, who up to now had been almost voluble, suddenly clamp shut their mouths. Everything indicates that the first rescue team found conditions worse than had been expected.

Thru a window we can see the men huddled over a map. They are pointing at the map and talking. They are in there almost an hour, then go back to the baggage car.

Another Effort

TEAM No. 2 is going in." says the state inspector. "See that your masks are tight."

Each man pulls the mask over his face. As he tries to inhale, the cheeks of the mask sink in. That shows the mask is air tight. He can't get air thru it, and must get it thru the chemical can, which hasn't yet been opened.

An electric motor with some flat cars on it draws up. Team No. 2 board the cars and go into the mine.

Explosion Violent

WE learn that the explosion had been very violent. Brattices of concrete and brick were blown out and the debris blocked the entries. The entire ventilating system had been wrecked, and it would be necessary to rebuild all the brat-

tices and get the air circulating before the trapped men could be reached.

Lumber, brattice cloth and other material is sent in on other cars. A base is established 400 feet in.

While team No. 2 is in the mine, Daniel and one of the U. S. bureau of mines men decide on a plan of action.

They have a map of the mine spread out on a box. It looks like a street map of a big city.

They decide that when team No. 2 comes out they'll send in two teams at once. They'll follow two main entries which will come together at a certain point. Other experts are called in and they agree that it's the only thing to do.

"It'll take about four or five inspector said. inspector said."

Futile Work Keeps Up

TEAM NO. 2 comes out about 4 o'clock, and the other two teams go in.

Those in the car drink coffee to keep awake.

It is getting light now. We leave the car. The bonfires are still burning in the cove and men, and some women, are still gathered around them. The lights are still burning in all the houses.

At 5:30 the train leaves for Pineville. I go on it to get some sleep.

Still On the Job

Sunday afternoon I returned to Kettle Island. The state inspector and the mine officials were still on the job. They hadn't had a wink of sleep.

"What results from the two teams you sent in at four this morning?" I asked the state inspector.

"They did their job as planned," he said.

"And they didn't find the bodies?"

"No, we didn't think they would. Where the two teams met was the starting point for the search for the bodies."

He said the crews had penetrated the entry between 5000 and 6000 feet and the bodies were thought to be about 1500 feet farther in. He had no idea how long it would take to find them.

16 MEN ENTOMBED BY COAL MINE BLAST

Gas Pocket Igniting Blamed for Kentucky Explosion; Rescue Squads Hold Little Hope

KETTLE ISLAND, Ky., March 29 (A. P.)—Sixteen men were trapped a mile and a half back under the rugged hills in a coal mine here late to-day with little hope for their survival. The explosion that tore out the brattice work was believed to have been caused by a gas pocket igniting.

Foul air from the explosion prevented local rescue squads from entering the mine, which was believed to be jammed with debris near the scene of the explosion, but work was started at once to brace the entrance shaft wall in preparation for the arrival of the State rescue squads.

At the office of the Pioneer Coal Company here the names of those entombed were announced as follows:

J. L. Jones, Jess Lasley, K. E. Hill, M. C. Vann, David Souders, Mason Sultz, Luther Hodge, Ed Osborne, Harvey Allen, Elmer Steele, John L. Cox, John Engle, Lee Johnson, Adron Helton, Raymond Simpson and Samuel Profitt.

Kettle Island is about eight miles from Pineville, and roads are so difficult that the only means of travel are trains and walking.

Pittsburg Sun Telegraph
April 4, 1930

FIND LAST OF 16 MINE VICTIMS

KETTLE ISLAND, Ky., April 4.
—(AP.)—The last of the bodies of the 16 miners entombed here Saturday by an explosion was recovered yesterday when rescue workers located the body of J. E. Hill, foreman.

All but one of the miners was married, and the disaster made 15 widows, and orphans of 51 children. An appeal for aid for them has been made by the Red Cross.

An investigation to determine the cause of the explosion will be held next week, it was announced by John F. Daniel, of Lexington, chief of State Department of Mines. Either a gas pocket or coal dust was responsible, it was believed. The interior of the mine was wrecked, causing a heavy property damage.