Central Mine Disaster Documents
Central Mine
Central Coal and Iron
Central City, KY
Accident date: January 19, 1912; 5:30 pm
Time range of materials: 2/19/1912-6/12/1912
Number of items: 4
Material types: preliminary report, report, lab data
Important persons mentioned: CS Stevenson (writer of report), Dave Doss, Ira Allen (both deceased), Mr. Huw Jones and father (mine rescuers)
Historical note: On January 19, 1912, at the Central mine, four men lost their lives due to the impact of an explosion and one passed away due to suffocation. This mine was opened originally in 1973 and was currently owned and operated by Mr. J O Bailey and Mr. W L Russel.
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Date	Type	Filed by	Subject	Size
2/26/1912	Lab report	Bureau of Mines	Chemical Laboratory Report for certain types of coal and rock found at the scene	5 pages
6/12/1912	Lab report	Bureau of Mines	Chemical Laboratory Report for Mine Air Samples	6 pages
2/19/1912	Preliminary report	Bureau of Mines	Mine explosion-preliminary report	1 page
2/19/1912	Report	Bureau of Mines; CS Stevenson	Final report of explosion	12 pages

DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

CHEMICAL LABORATORY REPORT

Test No. .....

Lab. No. 13256-F

Composite of Nos. 13257-F, 13258-F,

Sample of Coal. (Composite sample)

Can No. .....

From State of Kentucky

Investigation Mine accidents

County Muhlenburg

Section G. S. Rice

Town Central City, ½ mile S of city

Collector C. E. Stevenson

Mine Central

Operator Central Coal & Iron Co.

Bed of coal No. 9 seam

Location in mine .....

Method of sampling .....

Gross weight, ... lb. Net weight, ... lb.

Air-dry loss 5.80 Date of sampling ..... Date of analysis 2-16-12

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Percentages referred to coal (Moisture and ash free)
Proximate Analysis	Moisture	3.11	8.75		
	Volatile matter	40.09	37.76	41.37	45.11
	Fixed carbon	48.75	45.95	50.33	54.89
	Ash	8.05	7.58	8.30	
		100.00	100.00	100.00	100.00
Ultimate Analysis	Hydrogen	5.18	5.52	4.98	5.43
	Carbon	71.81	67.65	74.12	80.85
	Nitrogen	1.51	1.42	1.56	1.70
	Oxygen	10.64	15.18	8.14	8.88
	Sulphur	2.81	2.65	2.90	3.15
	Ash	8.05	7.58	8.30	
		100.00	100.00	100.00	100.00
Calorific value determined	Calories	7200	6778	7430	8132
	British thermal units	12960	12200	13374	14564
Calorific value calculated from ultimate analysis	Calories		6773		
	British thermal units		12191		

Date, February 26, 1912. (Signed) A. C. Fieldner, *Chemist.*

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DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Test No. _____ **CHEMICAL LABORATORY REPORT** Lab. No. 13257

Sample of Coal, standard mine sample. Can No. 20940

From State of Kentucky Investigation Mine accidents.

County Muhlenburg Section G. S. Rice

Town Central City, ¼ mile south of Central Collector C. S. Stevenson

Mine Central Operator Central Coal & Iron Co.

Bed of coal No. 9 seam Location in mine Face main south

Method of sampling Face sample Gross weight, 55 lb. Net weight, _____ lb.

Air-dry loss n 5.00 Date of sampling 1-25-12 Date of analysis 2-5-12

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Percentages referred to coal (Moisture and ash free)
Proximate Analysis	Moisture	3.27	8.11		
	Volatile matter	40.25	38.24	41.62	44.66
	Fixed carbon	49.49	47.01	51.15	55.14
	Ash	6.99	6.64	7.23	
		100.00	100.00	100.00	100.00
Ultimate Analysis	Hydrogen				
	Carbon				
	Nitrogen				
	Oxygen				
	Sulphur	2.53	2.40	2.61	2.81
	Ash				
Calorific value determined	Calories				
	British thermal units				
Calorific value calculated from ultimate analysis	Calories				
	British thermal units				

Date, February 26, 1912 (Signed) A. C. Fieldner, *Chemist.*

6—206 6—2303

DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Test No. .....

CHEMICAL LABORATORY REPORT

Lab. No. 115202 P

Sample of Road dust, grab sample.

Can No. 22520

From State of Kentucky.

Investigation Mine accidents.

County Muhlenburg.

Section S. S. Rice.

Town Central City, ½ mile S. of town.

Collector C. S. Stevenson.

Mine Central

Operator Central Coal & Iron Co.

Bed of coal No. 2 seam.

Location in mine room neck.

Method of sampling Grab

Gross weight, ½ lb. Net weight, ... lb.

Air-dry loss 8.30 Date of sampling 1-25-12 Date of analysis 2-6-12

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Percentages referred to coal (Moisture and ash free)
Proximate Analysis	Moisture	2.01	10.14		
	Volatile matter	30.41	27.69	31.04	45.57
	Fixed carbon	35.90	32.92	36.63	54.15
	Ash	31.68	29.05	32.33	
		100.00	100.00	100.00	100.00
Ultimate Analysis	Hydrogen				
	Carbon				
	Nitrogen				
	Oxygen				
	Sulphur	3.36	3.07	3.42	5.03
	Ash				
Calorific value determined	Calories				
	British thermal units	553.9 grams on 20-mesh sieve rejected.			
Calorific value calculated from ultimate analysis	Calories	250.0 grams thru 20-mesh sieve air dried and analyzed.			
	British thermal units				

Date, February 14, 1912 (Signed) A. G. Fieldner, *Chemist.*

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DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Test No. _____ **CHEMICAL LABORATORY REPORT** Lab. No. 13258

Sample of Coal, standard mine sample Can No. 20982

From State of Kentucky Investigation Mine accidents.

County Muhlenburg Section G. S. Rice

Town Central City Collector G. S. Stevenson

Mine Central Operator Central Coal & Iron Co.

Bed of coal No. 9 seam. Location in mine Room 520, main south blind, face of room.

Method of sampling Face sample. Gross weight, 40 lb. Net weight, _____ lb.

Air-dry loss 7.40 Date of sampling 1-22-12 Date of analysis 2-3-12

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Percentages referred to coal (Moisture and ash free)
Proximate Analysis	Moisture	3.16	10.33		
	Volatile matter	38.72	35.85	39.98	44.54
	Fixed carbon	48.22	44.65	49.79	55.46
	Ash	9.90	9.17	10.23	
		100.00	100.00	100.00	100.00
Ultimate Analysis	Hydrogen				
	Carbon				
	Nitrogen				
	Oxygen				
	Sulphur	3.19	2.95	3.29	3.67
	Ash				
Calorific value determined	Calories				
	British thermal units				
Calorific value calculated from ultimate analysis	Calories				
	British thermal units				

Date, February 26, 1912. (Signed) A. C. Fieldner, *Chemist.*

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DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Test No. ..... CHEMICAL LABORATORY REPORT Lab. No. 13259

Sample of Coal, standard mine sample. Can No. 21002

From State of Kentucky Investigation Mine accidents.

County Muhlenburg Section G. S. Rice

Town Central City, ½ mile S of city Collector C. S. Stevenson

Mine Central Operator Central Coal & Iron Co.

Bed of coal No. 9 seam Location in mine 20 - room #3 sixth south off main

Method of sampling Face sample Gross weight, 50 lb. Net weight, ... lb.

Air-dry loss 5.10 Date of sampling 1-22-12 Date of analysis 2-3-12

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Percentages referred to coal (Moisture and ash free)
Proximate Analysis	Moisture	3.05	7.98		
	Volatile matter	39.81	37.78	41.06	44.41
	Fixed carbon	49.84	47.29	51.39	55.59
	Ash	7.32	6.95	7.55	
		100.00	100.00	100.00	100.00
Ultimate Analysis	Hydrogen				
	Carbon				
	Nitrogen				
	Oxygen				
	Sulphur	2.63	2.50	2.72	2.94
	Ash				
Calorific value determined	Calories				
	British thermal units				
Calorific value calculated from ultimate analysis	Calories				
	British thermal units				

Date, February 26, 1912. (Signed) A. C. Fieldner, *Chemist.*

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DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Test No. ..... CHEMICAL LABORATORY REPORT Lab. No. 13261 F

Sample of Road dust, grab sample Can No. 2094

From State of Kentucky Investigation Mine accidents

County Muhlenburg Section G. S. Rice

Town Central City, ½ mile S. of town Collector C. S. Stevenson

Mine Central Operator Cental Coal & Iron Co.

Bed of coal No. 9 Seam Location in mine Main south st last break through

Method of sampling Grab Gross weight, 8 lb. Net weight, ... lb.

Air-dry loss 4.50 Date of sampling 1-23-12 Date of analysis 2-6-12

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Percentages referred to coal (Moisture and ash free)
Proximate Analysis	Moisture	1.51	5.94		
	Volatile matter	30.82	29.43	31.29	41.14
	Fixed carbon	44.09	42.11	44.77	58.86
	Ash	23.58	22.52	23.94	
		100.00	100.00	100.00	100.00
Ultimate Analysis	Hydrogen				
	Carbon				
	Nitrogen				
	Oxygen				
	Sulphur	3.51	3.35	3.56	4.68
	Ash				
Calorific value determined	Calories				
	British thermal units	505.9	grams on 20-mesh sieve rejected.		
Calorific value calculated from ultimate analysis	Calories	325.0	grams through 20-mesh sieve air dried and analyzed.		
	British thermal units				

Date, February 14, 1912. (Signed) A. C. Fieldner, *Chemist.*

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DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

CHEMICAL LABORATORY REPORT
MINE AIR SAMPLE

Received, 1/25/12 (Laboratory Record)

Bottle No. 1569 Laboratory No. 2041

Mine, Central Operator, Central Coal & Iron Co.

State, Kentucky County, Muhlenburg

Township, Sec. T. R.

Town (Distance and direction from) Central City

Name of coal bed, #9 Seam ft. in.

~~Room~~, 50' inside 3rd east overcast Entry, Main south blind.

Location in same, where sample is taken, 50 feet inside trap door

Are there gas feeders near where sample is taken? Strong or weak?

Are gas feeders from roof, coal, or floor?

Method of sampling, air displacement

Velocity, 450 Area, 40 Quantity, 18,000

Barometer: Inside, 29.40 Outside, 29.6

Corrected to sea level: Inside, Outside,

Bulbs: Wet, Dry, Humidity, %

Collector, C. S. Stevenson. Mailed, 1/23/12

Remarks (Note whether sample represents average mine air in locality or localized body of gas):

no cap on lamp.

CO_2	.56	H_2	
O_2	18.85	H_2S	
CO	.00	C_2H_4	
CH_4	.12		
N	80.47		
Total	100.00		

Date, 6/12/12 (Signed) Geo. A. Burrell.
Chemist.

6—2410

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DEPARTMENT OF THE INTERIOR

BUREAU OF MINES

CHEMICAL LABORATORY REPORT

MINE AIR SAMPLE

Received, 1/25/12 (Laboratory Record)

Bottle No. 1572 Laboratory No. 2042

Mine, Central Operator, Central Coal & Iron Co.

State, Kentucky County, Muhlenburg

Township, Sec. T. R.

Town (Distance and direction from) Central City

Name of coal bed, # 9 Seam 5 ft. 6 in.

Room, #21 Entry, main south blind

Location in same, where sample is taken, Face

Are there gas feeders near where sample is taken? Strong or weak?

Are gas feeders from roof, coal, or floor?

Method of sampling, air displacement

Velocity, 0 Area, Quantity,

Barometer: Inside, 29.6 Outside, 29.4

Corrected to sea level: Inside, Outside,

Bulbs: Wet, Dry, Humidity, %

Collector, C. S. Stevenson. Mailed, 1/23/12.

Remarks (Note whether sample represents average mine air in locality or localized body of gas):

CO_2	.06	H_2	
O_2	20.90	H_2S	
CO	.00	C_2H_4	
CH_4	.00		
N	79.04		
	100.00		

Date, 6/12/12 (Signed) Geo. A. Burrell.

Chemist.

6—2410

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DEPARTMENT OF THE INTERIOR

BUREAU OF MINES

CHEMICAL LABORATORY REPORT

MINE AIR SAMPLE

Received, 1/25/12 (Laboratory Record)

Bottle No. 1573 Laboratory No. 2043

Mine, Central Operator, Central Coal & Iron Co.

State, Kentucky County, Muhlenburg

Township, Sec. T. R.

Town (Distance and direction from) Central City

Name of coal bed, #9 Seam 5 ft. 6 in.

Room, Entry, Main West

Location in same, where sample is taken, 1000 feet from head of entry

Are there gas feeders near where sample is taken? Strong or weak?

Are gas feeders from roof, coal, or floor?

Method of sampling, air displacement

Velocity, 225 Area, 35 Quantity, 7,875

Barometer: Inside, 29.6 Outside, 29.4

Corrected to sea level: Inside, Outside,

Bulbs: Wet, 69 Dry, 70 Humidity, %

Collector, C. S. Stevenson. Mailed, 1/23/12.

Remarks (Note whether sample represents average mine air in locality or localized body of gas):

CO_2	.53	H_2	
O_2	19.40	H_2S	
CO	.00	C_2H_4	
CH_4	.18		
N	78.89		
Total	100.00		

Date, 6/12/12 (Signed) Geo. A. Burrell.

Chemist.

6—2410

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DEPARTMENT OF THE INTERIOR

BUREAU OF MINES

CHEMICAL LABORATORY REPORT

MINE AIR SAMPLE

Received, 1/25/12 (Laboratory Record)

Bottle No. 1574 Laboratory No. 2044

Mine, Central Operator, Central Coal & Iron Co.

State, Kentucky County, Muhlenburg

Township, Sec. T. R.

Town (Distance and direction from) Central City

Name of coal bed, #9 Seam ft. in.

Room, Entry, main south

Location in same, where sample is taken, 30 feet inbye fourth west

Are there gas feeders near where sample is taken? Strong or weak?

Are gas feeders from roof, coal, or floor?

Method of sampling, air displacement

Velocity, 70 Area, 35 Quantity, 2,450

Barometer: Inside, 29.6 Outside, 29.4

Corrected to sea level: Inside, Outside,

Bulbs: Wet, 55 Dry, 58 Humidity, %

Collector, C. S. Stevenson Mailed, 1/23/12

Remarks (Note whether sample represents average mine air in locality or localized body of gas):

CO_2	.07	H_2	
O_2	20.86	H_2S	
CO	.00	C_2H_4	
CH_4	.01		
N	79.06		
Total	100.00		

Date, 6/12/12 (Signed) Geo. A. Burrell.

Chemist.

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DEPARTMENT OF THE INTERIOR

BUREAU OF MINES

CHEMICAL LABORATORY REPORT

MINE AIR SAMPLE

Received, 1/25/12 (Laboratory Record)

Bottle No. 1575 Laboratory No. 2045

Mine, Central Operator, Central Coal & Irom Co.

State, Kentucky County, Muhlenburg

Township, Sec. T. R.

Town (Distance and direction from) Central City

Name of coal bed, #9 seam ft. in.

Room, Entry, main west.

Location in same, where sample is taken, at junction with main south blind.

Are there gas feeders near where sample is taken? Strong or weak?

Are gas feeders from roof, coal, or floor?

Method of sampling, air displacement

Velocity, 140 Area, 57 Quantity, 8,000

Barometer: Inside, Outside,

Corrected to sea level: Inside, Outside,

Bulbs: Wet, Dry, Humidity, %

Collector, C. S. Stevenson. Mailed, 1/23/12

Remarks (Note whether sample represents average mine air in locality or localized body of gas):

CO_2	.60	H_2	
O_2	19.07	H_2S	
CO	.00	C_2H_4	
CH_4	.26		
N	80.07		
Total	100.00		

Date, 6/12/12 (Signed) Geo. A. Burrell.

Chemist.

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DEPARTMENT OF THE INTERIOR

BUREAU OF MINES

CHEMICAL LABORATORY REPORT

MINE AIR SAMPLE

Received, 1/25/12 (Laboratory Record)

Bottle No. 1576 Laboratory No. 2046

Mine, Central Operator, Central Coal & Iron Co.

State, Kentucky County, Muhlenburg

Township, Sec. T. R.

Town (Distance and direction from) Central City

Name of coal bed, #9 Seam 5 ft. 6 in.

Room, Inside third east overcast Entry, Main south blind.

Location in same, where sample is taken, just inside trap door.

Are there gas feeders near where sample is taken? Strong or weak?

Are gas feeders from roof, coal, or floor?

Method of sampling, air displacement

Velocity, 450 Area, 40 Quantity, 18,000

Barometer: Inside, 29.4 Outside, 29.6

Corrected to sea level: Inside, Outside,

Bulbs: Wet, Dry, Humidity, %

Collector, C. S. Stevenson. Mailed, 1/23/12.

Remarks (Note whether sample represents average mine air in locality or localized body of gas):

CO_2	.62	H_2	
O_2	18.68	H_2S	
CO	.00	C_2H_4	
CH_4	.14		
N	80.56		
Total	100.00		

Date, 6/12/12 (Signed) Geo. A. Burrell.

Chemist.

6—2410

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

MINE EXPLOSION

File No. D-102

Mine Central Location Central City, Muhlenburg County, Ky

Company Central Coal & Iron Co Mailing address do

Date Jan 19, 1912 Time of day ____ a.m. 5:30 p.m. Mine working or idle ____

Total employment ____ Underground ____ Shifts worked ____ Daily production (tons) ____

Number men killed 5 Injured ____ In mine 5

Number men escaped unassisted ____ Rescued ____ Barricaded ____

Type (gas or dust) ____ Ignition source Blown-out shot Rock-dusted ____

Was breathing apparatus used Available (not used) Gas masks ____ Self-rescuers ____

Time required to reach explosion area ____

Classification (gassy or nongassy) Gassy Methane exhausted (24 hours) ____

Number of main fans 1-15' Brazil Quantity air per minute 30,000 cfm

Ventilation (continuous or split) ____ Face (line brattice or fans) ____

Mine openings Shaft Principal ____

Coalbed No. 9 bed Thickness 60" Volatile ratio ____ Roof Shale Floor fireclay

Mining system Room & pillar Pillars extracted ____

Room support: Main entries not stated Intermediate ~~Locomotives~~ Section ~~Mules~~

Transportation: Main Rope Intermediate Locomotives Section Mules

Electricity (voltage ac or dc) 250 dc Face ____ Portable lights Open

Principal mining machinery (continuous miners, conventional, etc.) Locomotives, pumps lights

Was machinery permissible type ____ Was it permissible ____

Blasting and explosives: Coal Black powder Grading or special use ____

Cause of explosion Blown out shot raised dust ignited by subsequent shot and propagated by dust and black powder

Did explosion result in fire or were fires found No

Point of origin Room 19, 1 South

Area affected Main South from 9 West to face & 3 & 4 ~~[illegible]~~ from main South to 1 South

Was Bureau report made yes Author(s) C S Stevenson

If no Bureau report, what and by whom ____

Remarks ____

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REPORT OF EXPLOSION

CENTRAL MINE

CENTRAL COAL AND IRON CO.,

CENTRAL CITY, KY.

JANUARY 19, 1912.

by

C. S. Stevenson,
Foreman Miner.

An explosion occurred at 5:10 P. M., January 19, 1916 in the Central mine of the Central Coal and Iron Co., at Central City, Kentucky, in which five (5) men lost their lives. Four of the fatalities were due to the violence of the explosion and one due to suffocation. The five men losing their lives were the only men in the mine at the time of the explosion, three of these being shot-firers and two were day men who had remained in the mine for the purpose of bonding track.

Location. Central mine is located 1/8th mile south of the depot at Central City, Muhlenburg County, Ky. It is on the Greensburg-Russelville branch of the L. & N., N. R., and on the Louisville branch of the I. C. System.

Ownership. Central mine is the property of the Central Coal and Iron Co., of which Mr. F. C. Bailey Mine Foreman, and Mr. T. L. Chesel General Supt.

Central mine was opened in 1875 in the #11 seam of the Geological Series of Western Kentucky, this seam being operated as a drift mine. Later a shaft was sunk to the present working seam.

Geology and Character of the Coal. The present working seam of the Central mine is the #9 seam of the Western Kentucky Geological series. At the hoist shaft the top of the coal is 170 feet below the crown ring of timbers. The coal is free from hills and has a general tendency dips north about 18 feet per mile. This seam outcrops to the east south and west of Central City. The thickness of the seam is between 4' - 6" and 5'. It has been known to reach 6' in thickness in rare instances. The surface topography in the vicinity of the mine is gently rolling this being due to stream action rather than to any folding of the strata.

Coal. The coal of the Central mine is marketed under the trade mark of Central City coal. It is used mostly for domestic purposes, a small amount being sold to the railroad trade.

The coal seam contains some sulphur in the form of balls and streaks.

An explosion occurred at 5:30 P. M., January 19, 1912 in the Central mine of the Central Coal and Iron Co., at Central City, Kentucky, in which five (5) men lost their lives. Four of the fatalities were due to the violence of the explosion and one due to suffocation. The five men losing their lives were the only men in the mine at the time fo the explosion, three of these being shot-firers and two were day men who had remained in the mine for the purpose of bonding track.

Location. Central mine is located 1/8th mile south of the depot at Central City, Muhlenburg County, Ky. It is on the Owensburg-Russelville branch of the L & N, R. R., and on the Louisville branch of the I. C. System.

Ownership Central mine is the property of the Central Coal and Iron Co., of which Mr. J. O. Bailey Mine Foreman, and Mr. W. L. Russel General Supt.

Central mine was opened in 1873 in the #11 seam of the Geological Series of Western Kentucky, this seam being operated as a drift mine. Later a shaft was sunk to the present working seam.

Geology and Character of the Coal The present working seam of the Central mine is the #9 seam of the Western Kentucky Geological series. At the hoist shaft the top of the coal is 170 feet below the crown ring of timbers. The coal is free from hills and as a general tendency dips north about 15 feet per mile. This seams outcrops to the east south and west of Central City. The thickness of the seam is between 4' - 9" and 5'. It has been known to reach 6' in thickness in rare instances. The surface topography in the vicinity of the mine is gently rolling this being due to stream action rather than to any folding of the strata.

Coal The coal of the Central mine is marketed under the trade name of Central City coal. It is used mostly for domestic purposes, a small amount being sold to the railroad trade.

The coal seam contains some sulphur in the form of balls and streaks.

A sulphur band lies near the bottom of the seam and this is a source of trouble in mining. For analysis of the coal see appendix.

Roof The roof of the coal is a black slate of from 2' to 4' in thickness, this is of substantial quality, and is overlaid by a kidney bed of from 3' to 4' in thickness. The kidney bed is so named because of its formation which is small kidney shaped concretions, when the roof of the coal is broken the kidney bed falls until the gray slate which overlies it is reached.

Floor The floor is of fire-clay which has a tendency to weather when exposed to air. Upon exposure for a year it weathers to an average depth of 6" and this feature of weathering is utilized by driving the narrow work about one year in advance of the turning of rooms, when it is desired to turns rooms the weathered portions are removed and the necessary height is thus secured.

Moisture The coal seam has an average amount of moisture. The roadways require sprinkling and this is done by sprinklingcars.

Gas The mine is known as non-gaseous. Some small feeders are found in the advance workings. Black damp is found in the abandoned workings.

Method of Working This is a shaft mine, the shaft having a depth of 170'. The mine is worked by the ordinary room and pillar system, see attached map.

Mining Pick mining is used, the coal being required to be mined for 1/2 of the depth of the drill hole. Considerable coal dust is made in mining but this is quickly mixed with the fire clay of the bottom and it is thought to be inert. It is the opinion of the writer that the coal dust on the haulage ways is not an element of danger as is shown by the high ash and moisture content of road dust samples given in the appendix.

Explosives Black powder of F and FF sizes is used exclusively. This is carried into the mine by miners in 25# cans and no boxes are provided for the stroage of the powder. At the time of the explosion the writer estimates that there was 3000# of powder in the mine, most of which was carelessly placed, many

kegs being found with the powder exposed, an incipient source of danger at all times.

The maximum charge of powder used was 7#, this is the equivalent of 4' of powder. Dry slack tamping is used exclusively and all firing is done by fuse. Shot-firers are employed and are are paid by the miners, however years of safety had caused neglect in the precaution of having all men out of the mine at the time of firing the shots and two day men lost their lives due to this neglect. The miners prepare the shots ready for firing and place a paper flag on the fuse to attract the attention of the shot-firer

Electric Equipment One Westinghouse D.C. belt driven generator is in use which supplies power at 250 volts. This is used to operate two 10 T. motors, one electric pump and lights at the bottom of the shaft and one the tipple

A battery telephone system connects the superintendents office, the hoisting engineer, the cager and the lyeway at the 1st, west.

Haulage The coal is gathered from the rooms and delivered to the motor lyeways by mules. All mules are removed from the mine at night. Two motors are employed one pulling coal from the 4th, E workings and one from the workings off the 1st, W. These motors are of the Jeffrey type.

40# rails are used on the motor haulage ways and 16# rails on the cross headings. In the rooms 3" X 4" wooden rails are used.

The cars are of the end dump swing door construction. A maximum topping height of 10" is allowed in loading the cars, and very little coal was found along the haulage ways.

Lighting Electric incandescent lights are used as noted above. The miners use open lights exclusively and these are about equally divided between the carbide and oil burning types. The company did not have any safety lamps at the time of the explosion, the only ones being used in the rescue work wer the property of Mr. Huw D. Jones, the district mine inspector, these were two

in number, one of the Davy fire boss type and one of the Wolf type.

Ventilation Ventilation is operated in two splits one of which ventilates the 3 and 4th, W and the working places of the 1st W., the other ventilating the East side, returning to the main south air course at the overcasts shown on the map at the 3rd, east.

Ventilation is supplied by a Brazil fan used exhausting, this is belt connected to a steam engine. The fan is 15' in diameter, of the paddle wheel type and delivers 30000 cu. feet of air per minute at a 2" water guage pressure.

The following air reading was taken 500' from the hoist shaft on the main intake.

Reading #1------Velocity 500 ft. per minute.

" #2 " " " " " .

Dry bulb 61-1/2 degrees, Wet bulb 59 degrees.

Dry bulb outside 54 degrees.

Aneroid-------29.6 Surface---------29.6

Area--------- 6'6""X 8'

Volume per minute----------26000 cu. feet.

Below is an air reading on the main return, taken in the main S. air course, 50' outby the 1st, W.

Reading #1----------Vel. 660 ft. per minute

" #2---------- " 650 " " "

Dry bulb----------70 degrees. Wet bulb 69 degrees.

Temperature outside---------54 degrees.

Aneroid 29.6 Outside 29.6

Cross section 5' X 7'

Volume-----22925 cul ft. per minute.

From these two readings it is estimated that on the day of making the investigation there was 800 gallons more water left than entered the mine.

For analysis of air samples see appendix.

Humidity The haulage roads are sprinkled daily by means of sprinkling cars. No other source of humidity is used.

Drainage One electric pump is located 1200' inby the mouth of the 1st, W. at the point marked DRILL HOLE on the map. This picks up the water from several small sumps on the 1st, W., and from the south headings working off the 1st, W. Two steam pumps are located at the bottom of the hoist shaft. One, a small Cameron, picks up water from several small sumps on the main south and discharges to a sump at the shaft bottom, and the other, a large Cameron, discharges the water from the sump to the surface.

Fire Protection There is no fire protection below ground. Water barrels are maintained on the tipple.

Story of the Explosion This explosion is the first in the history of Central mine. The mine was known as unusually safe. The explosion occurred at 5:30 P. M. and the only evidence of the explosion on the surface was a slight concussion noticed by two men who were standing near the shaft. These men notified the company officials and the district mine inspector by phone. The mine inspector reached the mine in a few minutes after the explosion and at once organized a rescue party of five men. The mine inspector has a rescue station located at this mine, the equipment consisting of two sets of Draeger apparatus and one pulmotor. All of the foregoing material was carried into the mine by the first rescue party and strict instructions were given that no one should enter the mine until at least 2 hours had elapsed. This party proceeded as far as the 4th, E. before noting any effects of the explosion. At this point they found the door of the 4th east displaced, they erected a temporary stopping and proceeded on fresh air by the main south as far as the lyeway (indicated on the map) beyond the 4th E. At the outby end of the lyeway they found two trips of cars not disturbed but the mule to one of the trips killed. At the middle point of the lyeway Ira Allen one of the day men was found, he had apparently met death by the force of the explosion.

At the inbye end of the lyeway, Dave Doss, another of the day men was found dead, two mules being found dead at this point. The party then proceeded to the face of the main South and found two of the shot firers just beyond the 4th W. The party then placed a stopping across the main south beyond the 4th, west, thus throwing all of the ventilation into the 3rd, and 4th, W. The only remaining man in the mine was known to be the shotfirer who worked in the 5,6,7, and 8th S, off the 1st W. The party then proceeded on the 3rd, W. as far as the junction with the 1st, S. At this point the force of the explosion seemed to have tailed out and since the current of fresh air was strong it was decided to leave all of the rescue apparatus at this point. The party then proceeded by the 1st, S, as far as room 18, where a rock fall was encountered.. Mr. Jones, father of the district mine inspector decided to go to the top of the fall and test for gas before allowing the rest of the party to cross, while so engaged the party noticed the air current diminish and Mr. Huw Jones asked his father to come off the fall as he was of the opinion that his body closed so much of the cross section at the top of the fall that he practically cut off the air current. The elder Mr. Jones had just started down from the fall when he fell unconscious. The remainder of the party succeeded in getting the unconscious man to the bottom of the fall when all of the remaineder of the party with the exception of Mr. Huw Jones were overcome. Mr. Huw Jones decided to try to get his father to fresh air and succeeded in carrying him back about 100', when he became so exhausted that he decided to try to get back to the helmets, during the latter part of this journey Mr. Jones remembers that he was so weak that he had to crawl and that he had to takefrequent rests. He reached the helmets in a semi-conscious condition and had just sufficient energy left to turn on the oxygen and throw his face into one of the helmets. He remained in this position perhaps 1/2 hour and at this time felt sufficiently revived to make an effort to go for help. He reached the main S., with great effort and at this point met another rescue party

This party decided to make a dash to the helmets where they would secure the helmets and then proceed to the men who were overcome. This plan worked successfully. Mr. Huw Jones returned as far as the helmets in order to instruct the men in putting them on. Two men with the helmets proceeded to the unconscious men and gave them oxygen with the aid of the pulmotor, as well as administering oxygen direct from extra cylinders of the apparatus. All of the men affected by the after damp recovered. After this experience there was no effectual rescue work done until the next morning when at 9:00 A. M. a rescue party proceeded by the main south to 1st west and decided to try and go down the 1st, west against the return air in an endeavor to find the missing shot firer. They had only gone 150' into the 1st, west when the body of the shot firer was found. He had undoubtedly lost his life by suffocation.

The movements of this shotfirer are interesting, since it was due to him that the first rescue party came so near loseing their lives. From the evidence at hand it seems that this man had almost finished firing his shots at the time of the explosion. He noted no effects of the explosion and finished his work and then proceeded by the 1st, west towards the top. He encountered the after damp coming out of the 1st S and decided it was too strong to go through. He went back to the face of the 1st, W where he secured brattice material with which he placed a temporary stopping across the 1st, S in the hope that he could keep back the after damp long enough for him the reach the main S. Undoubtedly this was what caused the stagnation of the air which was noted by the first rescue party. From this point the shot firer made a brave effort to reach the main S and fell after travelling 600'.

<u>Alleged Causes</u> The current theory of the explosion is that blown out shots in rooms 19 and 20 in the main S air course instituted a dust explosion.

<u>Rescue and Recovery Work</u> As previously stated two sets of Draeger 3rd, type 1910 rescue apparatus and one Draeger pulmotor were used in the rescue work. All of the rescue work and recover work was done on open lights with the exception

of the work of the first rescue party which carried both open and safety lamps.

No changes in the ventilation were made in the progress of the rescue work, except the brattice across the main S beyond the 4th, W as previously noted.

State Mine Inspectors Report Not available.

Coroners Verdict The coroners verdict was to the effect that five men lost their lives in the Central mine due to an explosion.

Personnel C. S. Stevenson, Foreman Miner, made the investigation for the Bureau of Mines. He arrived at the mine at 2 A. M., January 22nd, and concluded his investigation at 4 P. M., January 25th. Every possilbe courtesy and assistance was extended to Mr. Stevenson, especially by Mr. S. A. York, V. Pres., and Mr. Huw Jones, district mine inspector.

Extent of the Explosion. The explosion was very local in its effect. The only part of the mine affected was the main south heading and air course from the 4th, east to the face, and the 3rd, and 4th, west from the main south to the junction with the 1st, south.

Details of Evidence This subject will be considered in the following order:

1.- The main south heading beginning with the 4th, east and giving the evidence continuously to the face.

2.- The main south air course, beginning at the face and giving the evidence continuously as far outby as room 10.

3.- The 3rd, and 4th, west headings, beginning at the main south heading and giving the evidence continuously as far as the junction with the 1st, south heading.

Main South: The first evidence of violence was at the 4th, east door which was blown inbye into the 4th, east. From the 4th, east to the 4th, west the direction of greatest force was outbye.

There was no evidence of coking on the timbers or coal, between the

4th, east and the 4th, west, but inbye exposures were splashed with dust.

Carbon filaments were found in all parts of the affected area of the main south.

A trip of cars on the main south just inbye of the 4th, east was not disburbed, but a mule at the inbye end of these cars was killed. The hair on the mule was slightly singed.

Dave Doss, one of the day men was found on the lyeway beyond the 4th, east, he had evidently lost his life by the force of the explosion.

Two loaded cars at the inbye end of the lyeway were thrown outbye a distance of three feet and the topping was knocked off.

Two mules were killed at the inbye end of the lyeway. The hair on these mules was slightly singed.

There was a large amount of carbon filaments hanging from the timbers and roof at the inbye end of the lyeway.

There was great evidence of violence in the cross cut, opposite the entrance to the 4th, west. Two powder kegs were found in this cross cut in one of which the powder had evidently exploded. Handles on picks and shovels in this cross cut were broken and shovels were badly bent. Coke was found on both ribs of this cross cut and opposite it on the rib of the heading. This cross cut in the opinion of the investigator was the first relay point in the series of powder explosions that carried the explosion into the 4th west.

Curtain in first cross cut inbye of the 4th, west not blown down, no coke on the outbye side of the curtain but heavy coke splash on the inbye side of the curtain.

Small evidence of coking on the outbye side of the cross cuts between the 4th, west and the face of the main heading. There was heavy coke on both ribs of the last cross cut in the main south. The explosion came out of the air course into the heading through this cross cut.

2. Main South Air-Course:

In the main south air course there were nine working rooms, as shown on the accompanying (small) map. All of the shots in this air course had been lit by the shot firers, Wm. Matthews, and Eric Lindquist, as well as the shots in the main south heading. These men were evidently running for the 4th, west when the explosion occurred.

There were two shots in the air-course either of which could have caused the explosion, one of these shots was in room 19 and the other was in room 21. It is the opinion that both of these shots had a part in the instigation of the explosion.

Referring to the small map it will be noted that room 18 was being widened out through a cross cut in room in 19. This shot blew through and swept down a path of timbers in room 19. There was small evidence of coking on the right rib of room 19 going inbye.

Room 21 showed evidence of coking on all exposed projections of coal and opposite the neck of the room on the rib of the air-course there was a heavy coke splash.

Opposite the neck of room 22 were three cars badly wrecked.

The force of the explosion seemed to radiate from rooms 19 and 21.

A heavy coke splash was found on the air course side of the curtain which hung in the first cross cut ~~beyond~~ inbye the 4th, west.

The 3rd, and 4th, West Headings:

None of the shots in these headings had been fired by the shot-firers. The position of the shot-firers shows that they had just lit the shots in the main south and were making their run to the 4th, west when the explosion occurred.

The ventilation current for the west side of the mine passed down the 3rd, and 4th, west headings. At the time of driving these headings dirt steppings were placed in the cross cuts but these had fallen into disuse and a man could crawl over the top of any of them previous to the explosion.

There was no evidence of coking in the 3rd, west, but at places carbon filament hung from the roof and timbers.

All the evidence in the 3rd, west seemed to point decidedly to the explosion having come out of the 4th, west.

The material from the stoppings between the 3rd, and 4th, wests was all blown into the 3rd, west. This material had the appearance of having been carried out of the cross cuts by a stream of water and piled symmetrically in a drift form. These "drifts" tailed out in the direction of the main south. It was because of this that it was at first decided that the explosion had originated in the 4th, west, but the fact that none of the shots had been fired in the 4th west proved that this theory was incorrect.

In the 4th, west there was small evidence of coking on the outbye side of all room necks and entry cross cuts from room 8, to the main south heading.

The only evidence of heat in the rooms in the 4th, west was that the paper flags on the shots in rooms 2,3,4 and 5, were scorched.

Three cars were wrecked in the heading at room 7. These cars were driven into such a mass that a man could not pass them and because of them the return wave of the explosion in these headings came out of the 3rd, west to the main heading and gave material of the entry cross cuts the form previously referred to.

Three cans in which there had been explosions of powder were found at the necks of rooms 5, 4 and 7 of the 4th west.

One can of powder exploded in the cross cut opposite the mouth of the 4th, west on the main South. There were also an unexploded can of powder in this cross cut.

From room 8 in the 4th, west to the 1st south the force of the explosion gradually tailed out.

Summary of Evidence.

It is the opinion of the writer that the explosion was instituted by a

blown through shot in room 19 of the main south air course. This was sufficient to throw Mathews, the shot-firer, to the ground in the main south heading and it was at this time that he lost his cap and lamp as indicated in the small sketch map. He recovered himself sufficiently to arise and at the time of the blown out shot in room 21 he had reached the point where he was found. The blown out shot in room 21 occurred at a time when the air was filled with the inflamible smoke and gases from the blown through shot in room 19. As well there must have been a great quantity of dust in suspension in the air, and this combination produced sufficient flame to carry to the cross cut opposite the mouth of the 4th, west where a can of powder was ignited which carried the flame into the 4th, west where three cans of powder were ignited and these were the cause of the greatest violence of the explosion.

It is the opinion of the writer that this was a powder explosion in the main and that dust and gas entered into it to only a small degree.

Lessons

It is a dangerous practice to permit men to carry large amounts of powder into the mine.

Miners should be provided with a strong oak box for the storage of their explosives. This box should be provided with a padlock.

Rapid firing by shotfirers is a most dangerous practice and this explosion is an excellent example of the result of this practice.

A rigid system of checking men into and out of a mine where shot-firers are employed is essential.

When rescue apparatus is at hand it is the best policy to carry it with the party even if proceeding on fresh air.

Oxygen can be administered with good effect to an unconscious man in bad air by applying the ordinary means of artificial respiration and at the same time administering a small amount of the oxygen from the oxygen cylinder of a rescue apparatus.

Respectfully submitted,
C. S. Stevenson, Foreman Miner.