DEPARTMENT OF COMMERCE
BUREAU OF MINES
~~HEALTH & SAFETY BRANCH~~
SAFETY DIVISION

REPORT OF GAS AND DUST EXPLOSION IN MINE NO. 6, SUNDAY CREEK COAL COMPANY, MILLFIELD, OHIO NOVEMBER 5, 1930

By

J. J. Forbes, Supervising Engineer
G. W. Grove, Mining Engineer
S. P. Howell, Explosives Engineer
M. J. Ankeny, Asst. Mine Safety Engr.

Pittsburgh, Pa.

APPENDIX

REPORT OF GAS AND DUST EXPLOSION IN MINE NO. 6, SUNDAY CREEK COAL COMPANY, MILLFIELD, OHIO NOVEMBER 5, 1930

INTRODUCTION

A localized gas and dust explosion occurred in the northwesterly section of Mine No. 6 (Appendix A) of the Sunday Creek Coal Company, near Millfield, Ohio, on Wednesday, November 5, 1930, resulting in the death of eighty-two men, listed in Appendix F, of whom two were killed outright by the force and flame of the explosion; six by combination of burns and afterdamp; and seventy-four by afterdamp. About one hundred and forty men escaped or were rescued following the explosion. Of these one hundred and nineteen escaped with little or no assistance; two were rescued promptly following the explosion; and nineteen men were rescued from behind a barricade.

Notice of the explosion was received at the Bureau of Mines about 1:45 p.m. on November 5 from the Associated Press; and after a confirmation of their report, mine safety car No. 3 and crew - W. D. Walker, Jr., and R. A. Morgan then at California, Pa.; the Pittsburgh Safety Station mine-rescue truck with Messrs. J. J. Forbes, G. W. Grove, and K. L. Marshall; and S. P. Howell and H. R. Burdelsky by auto, left Pittsburgh, the truck first at 2:30 p.m., and all arrived at the mine by 9:45 p.m., November 5.

Because several of the officials of the company had been killed or entombed by the explosion, rescue work did not progress

perhaps with that speed and precision with which it otherwise would have, although all bodies had been taken out of the mine by 6:30 a.m., November 6, except four which were discovered on the afternoon of November 7 and removed from the mine by 11:00 p.m.

Ventilation had been sufficiently restored by Sunday morning, November 9, so that the official investigation could be made. This was done Sunday between 10:55 a.m. and 4:20 p.m.; dust and air samples were taken on November 9, 11, and 13; the coroner's inquest was held in Millfield, Ohio, on November 12 and the car and truck left the mine for Pittsburgh the afternoon of November 14.

Eleven Bureau of Mines men assisted in the rescue and recovery operations or in the investigation. They were J. J. Forbes, G. W. Grove, K. L. Marshall, S. P. Howell, H. R. Burdelsky, W. D. Walker, Jr., R. A. Morgan, M. J. Ankeny, W. H. Tomlinson, J. C. Marshall, Jr., and J. M. Webb.

LOCATION

Mine No. 6 of the Sunday Creek Coal Company is located in Dover Township, Athens County, Ohio, about one mile east of the unincorporated village of Millfield, Ohio.

The mine is served by a switch from Millfield of the Ohio Central Lines of the New York Central Railroad.

COMPANY OFFICIALS

The offices of the Sunday Creek Coal Company are in the Outlook Building, Columbus, Ohio. The officers there were:

George K. Smith, chairman, Board of Directors, and secretary
C. C. Cook, treasurer
P. A. Goss, vice-president
William E. Tytus, president
H. H. Upson, assistant to the president
R. J. Jones, assistant chief engineer

Other general officers of the company were:

H. E. Lancaster, chief engineer, Tiltonville, Ohio.
C. H. McKinley, district superintendent, Athens, Ohio.

The officers of Mine No. 6 were:

Walter Hayden, superintendent, Glouster, Ohio.
John Dean, mine foreman, Millfield, Ohio.
R. A. Marshall, assistant mine foreman, Glouster, Ohio.
Thomas Harley, assistant mine foreman, Millfield, Ohio.

EMPLOYEES

There were about 370 men normally employed at Mine No. 6, approximately 225 of these being employed underground on the day shift.

DAILY PRODUCTION

The daily production averages about 1500 short tons.

For about a month prior to the explosion the mine was operating about 3 days per week.

THE MINE

Mine No. 6 of the Sunday Creek Coal Company is a shaft mine. It was operating in the No. 6 bed which generally in this field dips southeasterly about 28 feet per mile. The mine is served by three shafts, a 3-compartment main shaft, 187.5 feet deep, which

is the full main return for the ventilation, and equipped with cages operated in balance used for hoisting coal and rock, raising and lowering men and supplies. The dimensions of this shaft are 24 feet by 10 feet 6 inches.

The second shaft, located about 300 feet from the main shaft, is used as a fan shaft and is the main air intake. This shaft is 176.5 feet deep. This shaft is about 15 feet by 20 feet in section.

A new air shaft completed about six months ago, but not in operation at the time of the explosion, is 176 feet deep. The new air shaft is located about 7100 feet from the main shaft. This shaft is divided into two compartments, one of these containing a stairway, and the other being for use as a fan shaft. A small fan was being installed over this shaft at the time of the explosion. The shaft, however, was sealed off from the active workings of the mine by stoppings located at and near the bottom of the shaft. One of these stoppings was partially wrecked by the explosion and this had an important bearing on the rescue and recovery operations, as will appear later.

Surface scenes at Mine No. 6 are shown in Appendix D.

The Coal Bed:

The No. 6 bed is a non-friable, medium rank, bituminous coal. The bed has a fire clay floor and in some places it is smooth and hard, such as near the foot of No. 3 N. entry on 18 E. off main

north. Above the coal is 12 to 14 inches of bone above which is a thin layer of slate and then about 60 feet of sandstone.

When the coal is overcut the immediate top is bone coal but when the coal is undercut the immediate top is slate. There is a very hard rock parting, about 2-1/2 feet from the floor. The roof stands well.

Sections of the No. 6 Bed:

Sections of the No. 6 bed, corresponding to the location where face samples were taken, are given in detail in Appendix H, both graphically (Figure 1) and by individual sheets.

The total thickness of the bed varies from 4 feet, 4-1/2 inches to 6 feet, 7-3/4 inches. Bone or other impurities occur in one to three places in the bed, each varying from 1/2-inch to 11 inches. The thickness of the coal samples varied from 4 feet, 3-1/4 inches to 5 feet, 9 inches.

The Coal:

Six samples of face coal from the No. 6 bed were taken on November 11 and 13, 1930, in Mine No. 6, Sunday Creek Coal Co., Millfield, Ohio, by J. M. Webb, R. A. Morgan, and J. O. Marshall, Jr., of the U. S. Bureau of Mines.

The coal analyses reports of these and of the composite sample are included in Appendix G of this report. The location where the samples were taken is shown on the map (Appendix A). Table 1 shows these analyses:

Table 1.- Analyses of samples of face coal, No. 6 bed, Mine No. 6, Sunday Creek Coal Co., Millfield, Ohio, after explosion of Nov. 5, 1930.

Date, Nov. 1930	Lab. No.	Location	Analysis, per cent: Air-dry loss	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Calorific value, as rec'd, B.t.u.	Softening temperature of ash, °F.	Ratio[a] VM/VM+FC
11	A-66124	10 feet from face of 17 W. off 6 N.	3.4	9.8	35.4	48.7	6.1	0.8	12,090	2430	0.42
11	A-66121	60 feet from face of 5 N.	3.4	8.8	35.5	50.3	5.4	0.6	12,420	2560	0.41
13	A-66235	60 feet from face of 3 N.	1.6	7.7	35.5	49.4	7.4	1.1	12,230	2510	0.42
11	A-66120	15 feet from face of 21 E. off 3 N.	2.3	9.3	35.4	50.0	5.3	0.9	12,330	2510	0.42
13	A-66236	Face of main N. Haulage entry	2.2	8.8	34.7	51.3	5.2	0.8	12,400	2550	0.40
13	A-66237	18 E. off Main N, 350 feet inby main N. Haulage entry.	1.8	7.8	36.0	49.2	7.0	1.1	12,310	2430	0.42
11 & 13	A-66126[b]	Composite of above 6 samples.	2.3	8.6	35.3	50.0	6.1	0.8	12,270	--	0.41

a Ratio of volatile matter (V.M.) to total combustible -[Volatile matter (V.M.) plus fixed carbon (F.C.)]

b The ultimate analysis of the composite sample on the "as received" basis is:

	Per cent
Hydrogen	5.6
Carbon	69.4
Nitrogen	1.4
Oxygen	16.7
Sulphur	0.8
Ash	6.1
	100.0

The analysis of the composite sample computed ash-free on the "as received" basis is:

	Per cent
Moisture	9.2
Volatile matter	37.6
Fixed carbon	53.2

The average air-dry loss is 2.3 per cent. On the "as received basis the average total incombustible (moisture plus ash) is 14.7 per cent. The average ratio of volatile matter to total combustible is 41.3 per cent.

The proximate analysis of the average sample - A-66126 - computed ash-free, places this coal as a medium rank, bituminous coal.

Of the six samples, air-dry loss varied from 1.6 to 3.4 per cent; the moisture from 7.7 to 9.8 per cent; the volatile matter from 34.7 to 36.0 per cent; the fixed carbon from 48.7 to 51.3 per cent; the ash from 5.2 to 7.4 per cent; the sulphur from 0.5 to 1.1 per cent; the B.t.u. from 12,090 to 12,420; the softening temperature of ash from 2420 to 2860 degrees F.; and the ratio of volatile matter to total combustible from 0.40 to 0.42.

To render this coal inmune from propagation of an explosion in case no gas is present, will require at least 65 per cent of incombustible dust. Some of this incombustible content is provided by the moisture and ash of the coal, but what the net effect of this and other variables will have on the quantity of added rock-dust required to prevent propagation of an explosion will be given after tests of the five-ton sample of coal from Mine No. 6 have been made at the Bureau's Experimental Mine.

Coal Preparation:

The coal is all prepared in a new Jeffries screening plant equipped with picking belts. This new plant was ready to operate about June 16, 1930; a total of about 72,000 tons of coal has been

run over it, most of this since August 1, 1930. Four pickers can be used on each belt. Some rock is picked off the railroad cars. Besides a domestic bin there are four loading tracks.

The following table shows the designation of the sized products, size of screen on which or through which collected, the percentage of each size, and the use of each size:

Designation	Size	Percentage	Use
Lump	On 4-inch	32	Domestic
Egg	On 2 x 4-inch	28	Railroad
Nut	On 1½-inch	10.5	Power plants
Slack	Through 1¼-inch	29.5	Philo power plant

For general power plant use the slack and nut are mixed, but before mixing the nut is run over the picking belt.

The No. 7 Bed:

About 125 feet above the No. 6 bed is the No. 7 bed. It is 3-1/2 to 4 feet in thickness, and in the immediate vicinity of Mine No. 6, the Sunday Creek Coal Co. has a mine - No. 7 - opened in this upper bed. It is pretty well worked out, and the main entries of the No. 7 Mine lie directly above the 3rd and 4th N. entries of the No. 6 Mine. There is a little standing water in Mine No. 7, and it was stated that none of the caves in the worked-out areas in Mine No. 6 had extended up to Mine No. 7.

road, and other dust, Mine No. 6, Sunday Creek Coal Co., Millfield, Ohio, after

Per cent through 20-mesh	Weight through 20-mesh, analyzed: grams	Per cent through 48-mesh	Per cent through 100-mesh	Per cent through 200-mesh	Analysis, as received: Total combustible, per cent	Moisture, per cent	Ash, per cent	Moisture, ash, per cent
Samples from within area of flame.								
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
71.7	538	64.8	55.6	16.9	75.5	11.1	13.4	24.5
86.9	594	58.9	31.3	20.7	75.4	8.9	15.7	24.6
77.3	490	60.2	41.2	30.4	73.4	10.8	15.8	26.6
87.6	571	51.8	31.0	23.3	72.3	8.9	18.8	27.7
75.0	485	63.2	39.4	27.5	73.0	13.5	13.5	27.0
62.6	404	48.9	28.7	18.4	73.5	9.4	17.1	26.5
72.5	447	57.7	37.8	31.5	73.1	13.6	13.3	26.9
86.8	736	47.7	29.7	20.0	61.7	8.3	30.0	38.3
72.3	357	73.3	55.1	50.8	62.0	20.6	17.4	38.0
49.4	570	40.6	26.7	15.5	65.4	8.2	26.4	34.6
71.7	350	49.3	33.2	23.4	72.4	13.3	14.3	27.6
75.0	780	43.6	26.2	15.2	46.9	6.6	46.5	53.1
93.8	184	95.4	91.2	86.6	59.6	12.2	28.2	40.4
57.3	706	48.3	26.9	14.8	47.7	7.6	44.7	52.3
94.7	1031	79.7	63.6	45.7	72.0	6.8	21.2	28.0
Samples from without, but near, area of flame.								
70.1	586	60.7	46.7	37.0	52.6	12.2	35.2	47.4
76.3	788	49.3	30.3	19.9	35.9	10.0	54.1	64.1
83.1	327	75.3	65.8	52.8	56.0	16.6	27.4	44.0
65.1	590	32.2	17.0	10.4	34.2	10.9	54.9	65.8
69.1	335	65.7	53.2	44.2	70.1	12.5	17.4	29.9
47.5	480	54.4	35.1	22.2	75.1	8.3	16.6	24.9
71.0	420	72.9	59.1	45.3	68.4	12.5	19.1	31.6
57.9	614	45.8	30.0	24.8	50.3	8.2	41.5	49.7
55.4	404	55.8	33.2	20.3	69.6	13.9	16.5	30.4
56.7	383	38.2	22.3	13.7	65.2	10.6	24.2	34.8
52.3	526	63.5	41.7	32.3	56.9	15.7	17.4	33.1
72.9	849	60.8	25.6	15.0	74.4	10.6	15.0	25.6
Samples remote from flame area.								
57.4	220	55.1	46.0	35.7	58.5	9.6	31.9	41.5
54.6	763	42.2	25.8	17.9	39.1	5.3	55.6	60.9
56.8	230	56.4	19.2	12.3	63.4	15.6	21.0	36.6
44.0	504	50.7	30.5	20.0	63.1	11.8	25.1	36.9

Analyses, as received							
Moisture,	Ash	Total combustible	Per cent through 200-mesh	Per cent through 100-mesh	Per cent through 48-mesh	Per cent through 20-mesh	Per cent through 10-mesh
Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent

Samples remote from flame area (Cont'd).

0.8	15.0	84.2	99.4	98.7	758	465	74.4
0.8	16.4	83.6	99.4	98.7	758	465	75.9
0.8	16.0	84.0	99.4	98.7	758	465	76.6
0.8	15.8	84.2	99.4	98.7	758	465	77.3
0.8	15.6	84.4	99.4	98.7	758	465	78.0
0.8	15.4	84.6	99.4	98.7	758	465	78.7
0.8	15.2	84.8	99.4	98.7	758	465	79.4
0.8	15.0	85.0	99.4	98.7	758	465	80.1
0.8	14.8	85.2	99.4	98.7	758	465	80.8
0.8	14.6	85.4	99.4	98.7	758	465	81.5
0.8	14.4	85.6	99.4	98.7	758	465	82.2
0.8	14.2	85.8	99.4	98.7	758	465	82.9
0.8	14.0	86.0	99.4	98.7	758	465	83.6
0.8	13.8	86.2	99.4	98.7	758	465	84.3
0.8	13.6	86.4	99.4	98.7	758	465	85.0
0.8	13.4	86.6	99.4	98.7	758	465	85.7
0.8	13.2	86.8	99.4	98.7	758	465	86.4
0.8	13.0	87.0	99.4	98.7	758	465	87.1
0.8	12.8	87.2	99.4	98.7	758	465	87.8
0.8	12.6	87.4	99.4	98.7	758	465	88.5
0.8	12.4	87.6	99.4	98.7	758	465	89.2
0.8	12.2	87.8	99.4	98.7	758	465	89.9
0.8	12.0	88.0	99.4	98.7	758	465	90.6
0.8	11.8	88.2	99.4	98.7	758	465	91.3
0.8	11.6	88.4	99.4	98.7	758	465	92.0
0.8	11.4	88.6	99.4	98.7	758	465	92.7
0.8	11.2	88.8	99.4	98.7	758	465	93.4
0.8	11.0	89.0	99.4	98.7	758	465	94.1
0.8	10.8	89.2	99.4	98.7	758	465	94.8
0.8	10.6	89.4	99.4	98.7	758	465	95.5
0.8	10.4	89.6	99.4	98.7	758	465	96.2
0.8	10.2	89.8	99.4	98.7	758	465	96.9
0.8	10.0	90.0	99.4	98.7	758	465	97.6
0.8	9.8	90.2	99.4	98.7	758	465	98.3
0.8	9.6	90.4	99.4	98.7	758	465	99.0
0.8	9.4	90.6	99.4	98.7	758	465	99.7
0.8	9.2	90.8	99.4	98.7	758	465	100.4
0.8	9.0	91.0	99.4	98.7	758	465	101.1
0.8	8.8	91.2	99.4	98.7	758	465	101.8
0.8	8.6	91.4	99.4	98.7	758	465	102.5
0.8	8.4	91.6	99.4	98.7	758	465	103.2
0.8	8.2	91.8	99.4	98.7	758	465	103.9
0.8	8.0	92.0	99.4	98.7	758	465	104.6
0.8	7.8	92.2	99.4	98.7	758	465	105.3
0.8	7.6	92.4	99.4	98.7	758	465	106.0
0.8	7.4	92.6	99.4	98.7	758	465	106.7
0.8	7.2	92.8	99.4	98.7	758	465	107.4
0.8	7.0	93.0	99.4	98.7	758	465	108.1
0.8	6.8	93.2	99.4	98.7	758	465	108.8
0.8	6.6	93.4	99.4	98.7	758	465	109.5
0.8	6.4	93.6	99.4	98.7	758	465	110.2
0.8	6.2	93.8	99.4	98.7	758	465	110.9
0.8	6.0	94.0	99.4	98.7	758	465	111.6
0.8	5.8	94.2	99.4	98.7	758	465	112.3
0.8	5.6	94.4	99.4	98.7	758	465	113.0
0.8	5.4	94.6	99.4	98.7	758	465	113.7
0.8	5.2	94.8	99.4	98.7	758	465	114.4
0.8	5.0	95.0	99.4	98.7	758	465	115.1

Sample of dust from tipple.

16.0	8.8	6.4	85.0	83.0	90.4	98.7	758

DUST

This coal when in the form of dust suspended in air is explosive. Because the usual deposits of coke on cubby and inby surfaces were not visible, the designation of this explosion as a gas and dust explosion and not simply a gas explosion is founded on the copious supply of coked particles of dust deposited throughout and beyond the entire explosion area and an estimation of the relative quantity of coked particles as made by the Coal Analysis Section of the Bureau of Mines in all of the dust samples taken. Photomicrographs of coked particles at 12 diameters are shown in Appendix E.

Much dry coal dust was observed throughout the mine, especially in the region affected by the explosion.

Table 2 shows the locations at which the 64 dust samples were taken; the position at which taken, that is, road, rib and roof, tipple, etc.; the proximate analyses of the samples; the relative quantity of coked particles found in the sample, if any; the fineness of the dust; and their apparent wetness or dryness when taken. The locations where the dust samples were taken are shown on the map (Appendix A). The individual dust-analysis report sheets are given in Appendix I arranged numerically by laboratory sample numbers. The data are grouped in Table 2 by areas as follows: 18 samples from within area of flame; 12 samples without, but near, area of flame; 33 samples remote from area of flame; and one sample from tipple.

Normally the mine is dry but on November 11 and 13 when the dust samples were taken, the roofs and ledges apparently had an unusually large percentage of moisture on them.

The dust samples within the flame area indicate an ample quantity of fine dust whose total combustible varied from 46.9 per cent for road sample A-66264 to 75.5 per cent for rib and roof sample A-66267. The three samples of settled dust and six other samples contained large amounts of coked particles and the seven other samples contained small amounts of coked particles. Notable is the very high percentage of minus 200-mesh dust in the rib and roof samples A-66136, A-66140, and A-66265.

The dust samples without, but near, the area of flame indicate an ample quantity of fine dust but whose total combustible varied greatly from 75.1 for road sample A-66137 to 34.2 per cent for road sample A-66272. There was a large amount of coked particles on 17, 18, 19, and 20 west near area of flame and small amounts elsewhere. The significant feature in this group of samples is the very high total incombustible in samples from 19 W. outby 3 N., varying from 44.0 per cent for rib and roof sample A-66271 to 65.8 per cent for road sample A-66272. This is due to the cinder ballast used along 19 W. haulage. The high total incombustible along this haulageway certainly extinguished the flame along 19 W. outby 3 N. and may have had a determining effect on localizing the explosion because of the release of pressure here at a critical moment.

The dust samples remote from the flame area show an ample

quantity of fine dust and, except for the samples taken on the main haulage roads, had a combustible content varying from 50.2 per cent for road sample A-66127 to 78.1 per cent for road sample A-66243. The dust samples taken on the main haulage roads - main N., 19 W. outby 3 N., 8 W., and 3 N. outby 13 W. - had a total combustible varying from 29.3 per cent for road sample A-66260 to 57.1 per cent for road sample A-66131.

Some 40.5 per cent of the machine cuttings - sample A-66284 - passed through 20-mesh, of which 38.3 per cent was through 48-mesh; 19.4 per cent through 100-mesh and 10.2 per cent through 200-mesh - and 81.9 per cent was combustible material. Such machine cuttings were the major source of dust distributed by the ventilating current and by haulage throughout the mine.

The very fine and high combustible content of the sample of tipple dust is shown in sample A-66282.

METHOD OF MINING

The double entry, room and pillar method of mining was used and all mining was done on the advance. No pillars are robbed.

Though some coal is undercut most of the coal is overcut by arc wall mining machines. It is shot with pellet powder fired by squibs. Much of the coal is loaded with pit-car loaders, and a larger proportion is to be so loaded.

The pit-car loaders are made by the Northern Conveyor and Manufacturing Co. of Janesville, Wisconsin, and are equipped with non-permissible 1-1/2 horsepower motors, there being one for each

conveyor.

There is very little timbering on new entries. There was considerable timbering in the old workings.

Ventilation and Gases:

The mine was rated as gassy by the Ohio Department of Mines. Two fire bosses were employed who made pre-shift inspections of active workings, and inspections twice a week of abandoned workings. The pre-shift inspection was made between 5:00 O'clock and 6:00 o'clock, a.m., and after 6:00 o'clock these fire bosses were mostly employed in building brattices.

The fire bosses only carry flame safety lamps, and these were of the non-permissible Wolf key-locked type, but were not locked.

Installed at the fan shaft was a double side inlet 7-foot fan operating blowing. By the operation of doors, the air current could be reversed. It was normally operated on 6-points, that is, about 75 per cent of full speed. The fan was equipped with a 60-inch pulley belted to a 20-inch pulley on a variable speed induction motor, model No. 2017, General Electric, of 100 horsepower, speed at full load, 700 revolutions per minute, on 2200 volts, 3-phase, 60-cycle, alternating current.

A steam engine was installed in the fan house as a secondary source of power and previously, prior to a water shortage, the fan had been normally operated by this steam engine.

The relation between the points on the starting controller and the percentage of full speed of the motor is estimated as follows:

On 3-point, 50 per cent; on 6-point, 75 per cent; on 9-point, 85 to 90 per cent; and on 12-point, 100 per cent.

At the time of the explosion the fan is said to have been delivering approximately 65,000 cubic feet of air per minute at about 2 inches water gauge.

The mine was ventilated (See Appendix A.) by two separate splits, one split of which presumably ventilated all of the section east of the main north entries. This section was inactive at the time of the explosion. The other split coursed through the area on the west side of the main north entries which included all of the active working places, the inactive third and fourth north, off 19 and 20 west, off the main north, section; and several abandoned unsealed sections. The major portion of the main haulage was on return air and the main shaft served as the main return. It is definitely known that only a small portion of the total intaking air reached the active working parts of this mine.

After ventilation had been restored, air samples and air velocities were taken at the places indicated on the map of the mine (Appendix A) on which is also shown the probable course of the air before the explosion and the course of the air after the recovery operations.

Table 3 shows the quantity of air circulating at the designated points and the quantity of methane produced in the 3 and 4 north section inby 20 west by each of the two splits, and for the entire mine. These data clearly indicate that the accumulation of gas in sections 3

and 4 off 20 west off main north can be easily accounted for. Details of the analyses of the mine air samples for the different locations are shown in Appendix J.

The following remarks apply to the analysis of mine air samples reported in Table 3.

Sample Laboratory No. 53166 was taken during the recovery operations and before the steppings between 20 and 21 east off 3 north had been erected inby the point of sampling, and when the air directed into these entries was short-circuited outby the point of sampling. At the time of taking this sample, the flame safety lamp showed no indication of methane, and the CO detector showed no indication of carbon monoxide. The sample was taken to confirm these readings, and did so, there being but 0.01 per cent of carbon monoxide and 0.22 per cent of methane.

After recovery operations had been completed and ventilation fully restored in the third and fourth north off 20 west section, samples 53150-1 were taken on Nov. 9 at the intake to this section, and samples 53156-7 taken in the return from this section. These samples show that this section was making in the neighborhood of 5,270 cubic feet of methane every 24 hours; that the intake air carried 0.16 per cent of methane and the return air 0.20 per cent of methane; that the entering air carried 27,680 cubic feet of methane per 24 hours and the return air carried 32,950 cubic feet of methane per 24 hours.

Analogous samples were taken on November 11, Nos. 53162-9, the intake air carrying 0.15 per cent of methane, and the return air, 0.20 per cent of methane, while the section was then making 11,780 cubic feet of methane per 24 hours.

These six samples amply demonstrate that substantial quan-

tities of methane were being produced in the section, so that unless ventilated, dangerous percentages of inflammable gas would accumulate there.

On November 9 then, enough methane was being made in this section to fill an entry whose average cross-sectional area was 73 square feet with an explosive mixture of methane and air at the lower limit (5 per cent) for a distance of 1440 feet, and similarly, on November 11, there was enough methane being made in this section to fill an entry with an inflammable mixture for a distance of 3,230 feet.

Presupposing a short-circuiting of the air to this section, the accumulation of a dangerous percentage of inflammable gas must result.

Table 1 shows further - sample No. 53165 - that the air entering the 13 west off 4 north section is free of methane and that the air returning from this and the 15 west section is making methane at the rate of 17,520 cubic feet per 24 hours with 0.13 per cent of methane.

Most of the air entering 4 north from 20 west off 4 north came from 4 north outby 20 west or from 19 west off 4 north as indicated by a comparison of samples Nos. 53167 and 53162.

Samples Nos. 53154 and 5 show that much of the return air from the west split returned by leaking through the abandoned sections just west of main north.

The full return - samples Nos. 53171 and 2 - carried an average of 0.14 per cent of methane and 90,720 cubic feet of methane

per 24 hours. This is enough methane to fill an entry 73 square feet in cross-sectional area for a distance of 24,850 feet with an inflammable mixture of methane and air containing 5 per cent of methane.

The seven face samples tabulated at the bottom of Table 5 show that methane is being made at all of the faces, the highest percentage being 0.44 per cent at the face of 6 north, sample No. 53168, and that substantial quantities were being made at the face of 22 east off 4 north and 21 east off 4 north, samples Nos. 53170, 82.

Haulage:

The track gauge is 42 inches and this is standard for all of the mines of the Sunday Creek Coal Company, save one.

Forty-pound rails are used on the main line haulage and twenty-pound rails on back entries and rooms. The clearance is 5-1/2 feet on both sides of the track.

Two types of cars are used; one is the square steel end-gate type of 3-ton capacity, and the other the side slope wooden end-gate of 2-ton capacity.

Main and secondary haulage is with trolley locomotives. Gathering is with crab-reel trolley locomotives.

All haulage is on return air except that portion of one of the two main line haulage routes, which is along 8 west off main north and a portion of 4 north off 8 west. Return air is here used to mean other than pure intake air. For haulage 200 to 275 volts direct current generated at 275 volts direct current is used.

The trolley lines were not guarded at any point either at cross-overs or elsewhere. The new haulage route recently in operation along main north inby 8 west and 19 west off main north outby 4 north had been ballasted with cinders thus accounting for the high ash content of the road samples taken on 19 west off main north.

Lighting:

Portable carbide lights were used for illumination by men and officials. Fixed lights were used at the bottom of the shaft at the landing, at main haulage switches, at all doors and side tracks.

Trips carried no tail lights.

Machinery Underground:

No permissible type machinery of any kind was used underground.

The power for all motor-driven machinery was 200 to 275 volts direct current.

There were nine trolley locomotives; two main line locomotives, one switch-haul motor, and six gathering locomotives of the cable-reel type.

There were five gathering pumps of which two discharged to the surface.

A total of seven mining machines were in use, five used for overcutting and two for undercutting. Of those used for overcutting three were of the 29-B Jeffrey arc wall type, and two of the 29-C Jeffrey arc wall type. One of the latter had at one time been per-

missible but it had not been maintained in a permissible condition. Of the two mining machines used for undercutting one was a Goodman Universal and the other a Goodman Standard type.

All pit-car loaders, mining machines, and crab-reel locomotives within the area of Appendix B are located therein; those outside this area are located on the map, Appendix A.

There were five power drills. Two were rock drills of the Jeffrey 10-A type; two were Van Dorn coal drills, and another one probably a Chicago pneumatic.

Power:

Steam generated at the mine is used for the hoisting engine and for the standby engine in the fan house.

Electric power is purchased; it is transformed from 22,000 volts alternating current to 2300 volts alternating current at the company's main transformer station and is transmitted to three substations located (a) on the surface in the hoist house, (b) underground at 17 east just off main north, and (c) underground in the first crosscut between 5 north and 6 north just inby 20 west (Appendix A).

The equipment at the three substations is identical and consists of a 150 kilowatt General Electric Rotary Converter (motor-generator set), the motor being a 206-volt alternating current, 3-phase, 60-cycle, and the generator being 275 volts direct current; and a transformer, the in-current being 2300 volts alternating current, and the outgoing current 206 volts alternating current. Each of the

three substations is provided with a switch at the substation; the two underground substations are provided with switches at the surface; and the current may likewise be cut off of each at the main transformers.

The motor for the fan previously described operates at 2300 volts alternating current.

The underground substation between 5 north and 6 north is a new substation, is served by an armored cable hung in the new air shaft, and was in operation at the time of the explosion.

The other underground substation at 17 east near main north is served by an armored cable in a borehole to the surface.

All power used underground is 200 - 275 volts direct current.

The explosion caused the power to go off the mine as evidenced by the circuit breaker at the hoisting room opening at 11:45 a.m., November 5, 1930, and the automatic reclosing switch would not stay reclosed, and would open promptly when closed manually so the switch was opened here. Workmen at the collar of the new air shaft pulled the switch there promptly after the explosion. The substation at 17 east near main north was evidently entirely forgotten since its motor-generator set was found running at mid-day on November 10 when the fire bosses inspected the entire mine but because of a short circuit in the mine the automatic reclosing switch was then open and presumably had been for the preceding five days. Then one of the fire bosses pulled the switch at this substation.

About 1:00 p.m., November 5, when Deputy Mine Inspector Ginman

and District Superintendent McKinley were in the mine, power from the substation at the main shaft was put on the main haulage outby 3 north on 8 west and main north and used to move the loaded trip them on 8 west to main north where it was placed on main north just inby 8 west.

About 4:00 p.m., when Chief Inspector E. W. Smith arrived at the mine, power from the substation at the main shaft was cut off the mine.

Explosives:

The explosives used in the six mines of the Sunday Creek Coal Company are received in carload lots at Murray City and are transported to the distributing magazine for Mine No. 6 (See map, Appendix A.) by a small automobile truck not especially equipped for the purpose. As observed, a home-made cardboard sign, "Explosives - Danger", hangs on the front of the truck at all times.

Mine No. 6 distributing magazine is located about 3800 feet west by southwest from the tipple in an isolated hilly section. It it 2500 feet from the Millfield School, 2000 feet from the nearest public road, 1800 feet from the main transformer station, and 1600 feet from the nearest inhabited dwelling.

The magazine is not barricaded.

The magazine is 10 feet by 12 feet in plan; the walls are 7 inches thick of two inside layers, of 6-inch tongue-and-groove, blind nailed lumber, and two outside 1-inch thicknesses of oak lumber with staggered joints. The wall has a 4-inch space filled with sand. The

immediate roof is a tray of sand above which is an air space. The floor is of wood and is blind-nail. The door, 3 feet wide, is made of 1/4-inch steel plate and two 1-inch thicknesses of oak and is secured shut by two straps of steel, but at the time of inspection but one of these was secured with a padlock. The one outside step was not in good repair. Except for the bolts in the door which secured the steel plate to the oak, no metal was exposed on the inside of the magazine. The magazine was well designed and well constructed. The space above the sand tray was ventilated by a single louvre window. The roof was of oak sheeting 1-inch thick and covered with slate.

The space about the magazine was clear of all dry combustible matter except a little dry bush against one side of the magazine.

At the time of inspection on November 13, this magazine contained nine 25-pound cases of pellet powder, No. 1B, 1-3/8 by 8-inch cartridges manufactured by the E. I. DuPont de Nemours & Company; fifteen 50-pound cases of "C" Extra Dynamite, 1-1/2 by 7-inch cartridges, manufactured by the DuPont Company; and eleven 50-pound cases of 1-1/4 by 8-inch 20 per cent strength extra Red Cross dynamite also made by the DuPont Company.

Explosives (pellet powder) are delivered to the mine just prior to 3:00 o'clock on Friday afternoons by automobile truck of no special construction, in the original 25-pound boxes. The explosives are transferred to a powder car which is placed on the cage during the night shift, after 3:00 o'clock p.m. The powder car is hauled alone by a trolley locomotive, from which the explosive is delivered to the

working places. Insulated couplings are not used.

As originally made, the powder car was of wood completely enclosed and had four slide lids on the top, each covering about one-quarter of the top of the car. No metal was exposed on the inside of the car. The car had no brakes.

As observed outside, it had but two slide lids in place and the grooves in which the other two slide lids had been placed were not on the car. In fact, the car had the appearance of not having been used for some time, and there was considerable sawdust or woodmeal in the bottom of the car as though it had been used as a cushion.

It is judged that this powder car is not suitable to even be repaired and a new powder car should be built.

It is understood that dynamite mentioned as being in the magazine was used during the recent construction work along main north and 19 west off main north, and that at the present time little dynamite is used in the mine.

All coal is blasted with pellet powder fired by squib, clay, and rock is blasted with 40 per cent or 60 per cent strength low freezing dynamite. Shooting is done in most cases by the miner any time during the working shift although in one section shot-firers are employed who blast during the shift.

Power augers are of 1-3/4 to 2-inch gauge for the starter, and three lengths are commonly used, the bottom of the hole being at least 1-5/8 inches in diameter.

Most of the coal is overcut to a depth of six feet with an

are wall mining machine; the holes are about 6 feet deep. The maximum charge used per hole in shooting coal is four cartridges (sixteen pellets). Machine cuttings are often used for stemming.

After the explosion there was found in the first break-through east of 3 north between 19 and 20 west, ten full and one open box of pellet powder. The cartridges from the open box were scattered about, and both boxes and cartridges were discolored by the coal dust.

After the explosion there was found on 20 west off main north about 400 feet west of main north on top of an old fall two half-cartridges of dynamite. Both half-cartridges were wet.

The eleven boxes found in the crosscut were placed here for the use of the shot-firer on the afternoon shift. He uses explosives in substantial quantities.

If the supply of explosives delivered on Friday afternoon is not adequate to last the entire week, small additional quantities are sometimes delivered on Tuesday afternoons and taken underground on the night shift.

Drainage:

The mine makes but little water which it easily handles by the five gathering pumps, two of which discharge to the surface.

Rock-Dusting and Watering:

No rock-dusting has been done in this mine.

No watering is done to allay dust in any part of the mine. Furthermore, the mine is naturally dry and dusty.

CONDITIONS IMMEDIATELY PRIOR TO THE EXPLOSION

The barometer at Ohio University, Athens, Ohio, about seven miles from Mine No. 6 had fallen gradually from 29.80 inches of mercury at 2:00 a.m., November 3, to 29.45 at noon, November 5, from which time it started to rise gradually. The temperature at Athens, Ohio, at noon on November 5 was 51^{0} F.

The mine had worked the two days previously, that is, November 3 and 4, and since November 4 was Election Day, a short shift of six hours was worked on that day. The mine was working normally the morning of November 5.

The fan was in operation as in a normal manner and it was stated by the District Mine Inspector that the fire bosses' report was clear.

About six weeks prior to the explosion, the track and trolley at the junction of 3 and 4 north and 19 west had been changed so that trips from the section inby 4 north on 19 west could be directed out 19 west and main north haulage instead of as previously out 3 north and 8 west to main north. This necessitated the removal of a brattice on 19 west near 3 north. Shortly after this, fixtures for an automatic mine door to be installed at this point had been brought in, but the door had not been made or installed prior to the explosion. This caused the short-circuiting of the air at this point and permitted the accumulation of gas in the 3 and 4 north section inby 19 west.

The investigation disclosed that the section insulator switch which was installed on the trolley line entering 4 north inby

19 west was closed at the time of the explosion. This switch was located on 4 north, 75 feet inby 20 west. As this section - 3 and 4 north inby 19 west - had been inactive for many weeks, there was no necessity for the power being on the trolley line inby the section insulator.

All three substations were delivering current to the mine at the time of the explosion.

It was brought out at the coroner's inquest that there was a difference of opinion between the mine foreman and the fire bosses as to whether the fire bosses should inspect the old workings or do "a more important thing" such as building brattices and that the mine foreman insisted on their doing the "more important thing". It is probable, therefore, that old or inactive workings were not inspected as often or as thoroughly as they should have been.

The new air shaft was sealed at, and near, the bottom and the small fan installed over it was not in operation.

At the time of the explosion, workmen were closing that portion of the top of the new air shaft which was outside the fan duct. This consisted of placing and securing planks over the collar of the shaft.

The official party, including several visitors, had reached the vicinity of the new substation when the explosion occurred.

PREVIOUS EXPLOSIONS

It was reported that there had been no previous explosion in this or nearby mines but a gas explosion with no fatali-

ties was reported in a mine near Glouster, some 25 or 30 years previous. Details of this are not available.

It was also reported that some ten years ago there had been a fire in this mine which resulted in no fatalities.

PROPERTY DAMAGE

The aggregate property damage to trolley wire, track, wood, and brick stoppings, doors, pumps, cars, is estimated at $1500. Full time operation was to be resumed on November 20, 1930.

RESCUE AND RECOVERY OPERATIONS

The explosion occurred about 11:45 a.m., Wednesday, November 5, 1930.

The fan was in no way damaged by the explosion and it continued in operation.

Though a slight air movement was noted at the bottom of the shaft, it was not known there that an explosion had occurred.

A farmer - B. H. Pettit - who lived near the new air shaft, and his son were returning from work, in a field, toward the new air shaft, and saw Ed. Dempsey - a mechanic who was working on top of the shaft - blown from the top of the shaft and land 15 feet from the shaft. Pettit immediately rushed home and attempted to report the occurrence to the office at Mine No. 6 but was unable to get them on the telephone, so reported it to the office of the Sunday Creek Coal Company at Glouster, Ohio, who in turn reported it by telephone to the superintendent's office near the main shaft of Mine No. 6.

The explosion wrecked the stopping or seal at the bottom of

the new air shaft, thereby changing the ventilation in a part of the mine. (See maps, Appendices A, B, and C.)

Six men escaped up the manway compartment of the new air shaft within an hour after the explosion according to George Rasp, an arc wall machineman, whose version is confirmed in part by Joe Reynolds and B. H. Pettit.

The first man out was George Rasp, followed in sequence by Frank Shumway, Lester Shumway, Joe Reynolds (who was working in No. 11 room off 20 west at the time of the explosion), Steve Butsko, and DeVore.

DeVore was too weak to reach the top of the shaft alone so Tod Beal,(a carpenter who had been working at the top of the new air shaft) went down two flights and helped him out.

A seventh man, Emerson LeFever, collapsed six flights down and,after about twenty minutes, James Mackey (a fire boss at Mine 255, Ohio Collieries, who was off shift and nearby when the explosion occurred) went down after him, carried him up two or three flights, and called for help, and Tod Beal went after Mackey and Pettit and another also assisted so that finally LeFever's body was recovered. Artificial respiration was administered for about 1-1/2 hours but without success.

When the explosion occurred,assistant mine foreman Robert Marshall was at the lower switch on 4 north, i.e., just inby 8 west off main north, and he with other nearby men directed, or assisted, at least 111 men from the 13 east, 13 west, and 16 west entries off 3 and 4 north out 3 north, 8 west, and main north.

A party of six led by Marshall found a machineman, Frank

Williams, at the door near 16 west and 4 north and though apparently dead and badly burned, they carried him to fresh air at 13 west and 4 north, gave him artificial respiration for about an hour and finally carried him out on an improvised stretcher. This was the first injured man to reach the bottom of the main shaft, where they arrived about 1:30 p.m., November 5.

About this time, Deputy Mine Inspector Andrew Ginman arrived, and Marshall and others under Ginman's direction erected stoppings at 7 east and 4 north and conducted air up 17 west. They then proceeded up 17 west by erecting temporary stoppings where they found the first body at No. 11 room on 17 west and as they proceeded up 17 west they found many more bodies (Appendix B).

On reaching 5 and 6 north off 18 west, they proceeded up these entries to 19 and 20 west. After reaching 19 and 20 west, an exploration was made up 5 north where the bodies of the official party were located a short distance inby 20 west on 5 north. One of the men in the rescue party (Jake Maurer) wore a self-contained oxygen breathing apparatus a short distance ahead of fresh air at this point and located two additional bodies on a side track off 5 north.

The rescue party made its way to the bottom of the new air shaft, arriving there about 8:00 p.m., and by calling up the air shaft to Chief Mine Inspector E. W. Smith, informed him that bodies found were dead.

The rescue party then returned to 17 west off 4 north and at this time was joined by Deputy Inspectors Elmer Sagle and Val E. Brown.

After a consultation, the rescue party proceeded up 17 west by building additional stoppings and when about 600 feet from the face Sagle heard some one whistle. This proved to be one of the 19 men behind the barricade, which was found at about 9:00 p.m. (Appendices A and B.) Fresh air was then conducted to the barricade and the men removed to fresh air where artificial respiration was given to most of them and aromatic ammonia to all of them.

After additional treatment by doctors who were brought in from the outside, the rescued men, all save one who walked out, were carried on stretchers to the shaft bottom, wrapped with blankets and removed to the surface. All of them after reaching the surface, excepting the one who walked, were given oxygen intermittently for several hours before being removed to the hospital or their homes. The wrapping of these men in blankets and the administration of oxygen probably resulted in the saving of a number of lives as some of them were in serious condition when rescued.

Following the rescuing of these men, the rescue party proceeded outby on 18 west to 5 north and again made their way to the bodies of the official party located inby 20 west on 5 north. About this time, the rescue party was joined by J. J. Forbes and G. W. Grove of the U. S. Bureau of Mines. After a conference the exploration work was continued up 5 and 6 north, and 21 and 22 west off 6 north where another barricade was found at the face of 21 west (Appendiced A and B). On opening the barricade, the bodies of 7 men were located. All of these had apparently been dead for some time. At about this time

three additional Deputy Mine Inspectors, Lot H. Jenkins, Thos. Reese, and Andrew Mullen, joined the rescue party. After this the remainder of 5 and 6 north and 21 and 22 east off 5 north were explored. The rescue party then went to 17 west at 4 north where a mine-rescue team from Elm Grove Mine, Valley Camp Coal Company, Elm Grove, W. Va., wearing gas masks, explored up 4 north and on to 19 west off main north, finding Andy Kish, Jr., the trapper boy, at his assigned station at the sand box at the west end of the switch on 19 west off main north. A fresh air crew following the Elm Grove team then found Clyde Dean, the pumper, on 4 north about 300 feet north of 18 west. Both of these men were badly burned.

By this time it was thought that all of the dead had been located and all bodies then located were taken out of the mine by 6:00 o'clock, Thursday morning. However, it developed that 4 bodies were yet to be found, and they were all located - one at the foot of the new air shaft; one on 6 north, 300 feet inby 20 west; and two six flights up the air shaft. These bodies were removed by midnight, Thursday.

On Thursday afternoon, on the initiative of Mr. Forbes, a conference of state officials, i.e., mine inspectors, company officials, and representatives of the Bureau of Mines, was held to organize for the completion of the recovery work. It was agreed that two representatives of the Bureau of Mines, two state inspectors, and representatives of the company with six to twelve material handlers, brattice men, and drivers, should comprise each of three shifts of

eight hours each, working continuously, beginning at 7:00 o'clock, Friday morning, and continuing until the work was completed.

This work consisted in erecting brattices and doors, sealing the new air shaft, all in proper sequence, in order that the entire active portion of the mine and the inactive portion on and off 3 and 4 north inby 20 west off main north could be explored.

This work was completed by 7:00 o'clock, Sunday morning, November 9.

MINE CONDITIONS AFTER THE EXPLOSION

The official underground investigation was made between 10:55 a.m. and 4:20 p.m., Sunday, November 9, by representatives of the mining company, the State Mining Department, U. S. Bureau of Mines, and interested Ohio mine officials. This and other inspections showed that the principal damage to the mine was the blowing out of stoppings, the carrying down of trolley and power lines in certain sections; the displacement of a pump near 19 west inby 4 north, located in room 4 off 18 west toward 18 west for about 20 feet; and the displacement of certain I-beams on 19 west off main north outby 3 north. Some track was also apparently displaced on 21 and 22 east off 3 north.

The force and flame of the explosion apparently came out of 3 and 4 north onto 19 and 20 east and west as from a blunderbuss, and the flame and force of the explosion extended from this point outby and inby 19 and 20 east and west off 3 and 4 north and outby 3 and 4

north naturally in accordance with the contour of the entries and rooms as shown in Appendices A, B, and C.

The seal at the bottom of the new air shaft, which was the roof of the 20 west entry, was damaged by the explosion, causing the ventilation to return up the new air shaft.

It was determined on the official inspection, and previously by a few others, that the section on 3 and 4 north off 20 west off main north, though it had been inactive for six months, still had the power of the trolley line in it; that a trolley hanger pulled out by a fall; that the trolley line along 21 east off 3 north at a point 200 feet outby the face of this entry was broken; that this was a fresh break; and that the ends of the trolley wire were beaded as though by a spark or an arc.

Because of this combination of circumstances it appeared that the most probable cause of the explosion was the ignition of an accumulation of gas on 21 east, 200 feet outby the face of 21 east off 3 north by an arc or spark from the trolley wire on the rail which trolley wire had been broken by a fall (Appendix C).

There was, however, a rather large and extensive fall at the face of 4 north (Appendix C), some of which had fallen after the explosion but some of which had fallen during or before the explosion, which may have displaced the inflammable gas out of this section onto the open light worn by the pumper on 4 north somewhere inby where his body was found, i.e., 300 feet north of 18 west off 4 north.

STATE INSPECTORS' CONCLUSION

It was the conclusion of the Chief, Division of Mines of Ohio, that the gas and dust explosion was probably caused by an arc or spark from a trolley line igniting an accumulation of gas on 21 east off 3 north not far from the face of 21 east. The arc or spark was caused by a fall of roof carrying the trolley line to a rail.

Prior to the report of the Metallurgical Department, Ohio State University, it was held as possible that an open light might have caused the ignition of gas, but subsequent to that report this possibility was not held.

INVESTIGATION OF BROKEN TROLLEY WIRE

Professor Dana J. Demorest, Metallurgical Department, Ohio State University, Columbus, Ohio, after making a metallurgical investigation of the broken trolley wire from 21 east off 3 north, Mine No. 6, Sunday Creek Coal Co., concluded that the break in the trolley wire was a new break and that it had arced after it broke.

CORONER'S INQUEST

The coroner's inquest was held in a motion picture theatre at Millfield on Wednesday, November 12, 1930, by the coroner of Athens County, Mr. L. F. Jones, assisted by Prosecutor R. D. Williams.

Salient features brought out at the coroner's inquest were:

A. That after the pre-shift inspection the firebosses worked on the brattices and doors, i.e., attempted to improve the ventilation at the working places.

B. That on occasion when the firebosses told the mine foreman

they were going to inspect the old workings, he ordered them to do other things in line with their work - that is, build brattices, etc.

C. That the gas accumulation could probably not accumulate in the 3 and 4 north sections between 3:00 o'clock a.m. and the following midday.

D. that because of the apparent lack of coke formation, it was thought by some witnesses that the explosion was of gas only though Deputy State Mine Inspector Andrew Gilman testified that it was a "gas and dust" explosion.

E. That the explosion originated in the 3rd and 4th north sections inby 20 west off main north.

F. That the most probable cause of the explosion was an electric arc at the point where there was a broken trolley line on 21 east off 3 north.

G. That it was possible that the explosion was caused by an open light.

The coroner's report is given in Appendix K.

SUMMARY OF EVIDENCE AS TO THE CAUSE, ORIGIN, AND PROPAGATION OF THE EXPLOSION

During the recovery operations, much gas was found on 3 north just inby 20 west off main north and during the official inspection gas was detected by a flame safety lamp at the face of 22 east off 3 north, and at the face of 22 and 21 east off 3 north by a U.C.C. Detector as well as elsewhere in this section and in return air along 19 west off main north and along main north, varying from 0.35 to about 1 per cent.

Though properly searched for, no evidence was found that a door had been placed on 19 west off main north between 3 north and 4 north - a gathering haulage road - which would have been necessary had the air been conducted properly up 4 north and back down 3 north. It is, therefore, concluded that for at least several days, perhaps several weeks, this 3rd and 4th north section had not been ventilated. This would cause an accumulation of gas somewhere in this section.

Though the trolley line along 4 north inby 20 west off main north was wrecked as a result of the explosion, a careful inspection of it showed that it's sectional switch was closed, and had been closed at the time of the explosion, and that power was then on the trolley line in this section.

The freshly broken trolley line having a "beaded" end at a position 200 feet outby the face of 21 east off 3 north and the presence of a fall which evidently broke this trolley wire down, point definitely to this as the most probable point of ignition, and that ignition was by an electric arc or spark between the trolley line and the rail at this point.

The direction of force as shown by track, trolley hangers, and trolley wires displaced, stopping and I-beams blown out, indicates that the origin of the explosion was in the 3rd and 4th north section particularly on 21 east off 3 north.

The finding of a considerable quantity of coked particles

in the assigned explosion area and the finding of successive lesser quantities in samples without the explosion area, and in an area where they could be carried by the force of the explosion or perhaps in such directions by the ventilating current after the explosion indicated definitely (1) that coal dust entered into the explosion, and (2) assisted in the elimination of other areas in the mine as possible places where the explosion might have originated.

Reference to the area of flame in the Appendices A and B shows that it extended a considerable distance on 3 and 4 north outby 19 west; a shorter distance west from 3 and 4 north along 17, 18, 19, and 20 west; and a still shorter distance east of 3 and 4 north along 19 and 20 west. It will be recalled that the five samples taken along the side track along 19 west just outby 3 north had a very high ash content, some of the samples approaching that recommended as a minimum content for rock-dusting. It, therefore, can be definitely concluded that the flame on 19 and 20 west was extinguished because of this high ash content and that the flame was extinguished along the other entries in a westerly and southerly direction by the release of pressure behind the advancing flame, this release of pressure being along 19 west just outby 3 north. Another reason why the flame was extinguished, but of lesser importance, was the expansion into the rooms off 18 west inby 4 north, especially those rooms which were nearer to 4 north and the expansion from 19 west into room 4 which extended through to 19 west. This action would likewise tend to release the pressure back of the flame front, advancing along 19 and 20 west, 17 and 18 west, and 3 and 4 north in the vicinity of 16 west.

To be potent this release of pressure behind the advancing flame front must occur at the moment when it can be effective and it is, therefore, not safe to predict that a single rock-dusted entry will usually have this desirable effect although it apparently did so in this case.

Violent though the gas explosion was in the 3 and 4 north section, it can not be said that this gas explosion was as violent as it might have been, for the accumulation of gas in this section was probably not of that composition and quantity that the maximum violence was produced.

COMBINATION OF CIRCUMSTANCES WHICH PRECIPITATED THE DISASTER

The primary cause of the explosion was the accumulation of gas in the 3 and 4 north section. Gas accumulated there because the air was short-circuited. The air was short-circuited primarily because the automatic doors were not made and placed. Also the fire bosses had too much work to do.

There is no excuse whatever why wire should have been in the 3rd and 4th north and inactive section and still less excuse for power being on the wire prior to the explosion. Lack of attention to these important details made possible the ignition of the body of gas.

A fall of roof carried the live trolley line to the rail causing the arc which ignited the accumulation of gas resulting in a gas and dust explosion.

Though this mine is classed as gassy by the Ohio Department of Mines, open lights were permitted, and the lack of appreciation of

the hazard of open lights in a gassy mine is greatly to be deplored.

PROBABLE CAUSE OF THE EXPLOSION

The explosion was certainly caused by an accumulation of gas at 3 and 4 north section, the ignition of which was in all probability caused by an electric arc between a trolley line broken by a fall and a rail in an inactive section, and where there was no reason whatever for power being on the line.

It is remotely probable that the ignition of this gas may have been caused by open lights worn or carried by the pumper somewhere along 4 north inby 18 west off 4 north, for one of his duties was to go 50 feet into 4 north inby 20 west off 4 north to open or close the valve of a water line through which the water was pumped out of this section.

RECOMMENDATIONS

In order to prevent a recurrence of a similar disaster and to increase safety in this mine it is hoped that careful consideration will be given to the following recommendations. Most of these recommendations have been discussed verbally with the officials of the company.

1. A ventilating fan of adequate capacity for present workings and future developments should be installed over the new air shaft.

This fan should be operated exhausting and should be connected to the ventilating system in such a manner that the entire new main haulage would be on pure intake air fresh from the outside.

The fan should be offset at least thirty feet from the

top of the shaft and the air conducted from the shaft to the fan by an air duct substantially built of fire-proof material.

Explosion doors should be installed at the fan, which, in the event of an explosion, would release the explosion pressure and prevent possible damage to the fan.

The fan should be so equipped and installed that the air current may be reversed at any time in case of emergency.

The fan should be equipped with an automatic power release which would cut off all power from the mine in case of stoppage of the fan.

2. All worked-out areas between the main north entries and 3 north, and all old workings to the west of 4 north, including 7, 8, 9, 10, 11, 12, 13, 14, 15, and 16 west off 4 north, should be effectively sealed off from the rest of the mine by strong fire-proof stoppings.

Seals which are conveniently located near return airways should be provided with pipes and valves through which air samples can be collected and pressure released when necessary.

3. The present workings, and in future developments, each set of north entries should be worked on primary splits of air. All east and west entries worked off the norths should be placed on secondary splits.

In order to do this efficiently, all sets of north entries should be driven in sets of three entries each. The center entry should compose the haulage and intake, and the parallel entries the returns.

Rooms should be developed off one entry of each pair only, and the entry from which they are developed should be the intake entry.

When a panel becomes worked out it should be effectively sealed from other portions of the mine by strong fire-proof stoppings, and the air which it normally used should be diverted to new workings.

4. Fire-proof stoppings only should be used in any mine. The use of wood and brattice cloth for building permanent stoppings should be discontinued.

5. The use of doors for regularly coursing the air should be avoided as far as possible. With the system of ventilation recommended above, doors need only be used temporarily.

6. Overcasts should be substantially built of fire-proof material and should be constructed so as to allow an easy passage of air over them.

7. The quantity in cubic feet of pure intake air flowing per minute in any ventilating split should be at least equal to 100 times the number of men in that split and as much more as may be necessary to dilute and render harmless all explosive and noxious gases.

The air should be made to circulate continuously to the face in every unsealed place into which an appreciable amount of methane enters.

Any place in which methane is present in sufficient quantity to be detected by an approved flame safety lamp should be considered unsafe and should be fenced off, and no one should be allowed

to enter such places except for the purpose of improving the ventilation.

8. Permissible electric cap lamps should be used by all employees for illumination, and permissible flame safety lamps should be used by officials for inspection purposes.

9. The mine should be thoroughly rock-dusted in every open part to within 40 feet, at least, of all working faces, and the rock-dusting should be maintained so that the non-combustible content (ash and moisture) shall be 65 per cent or more at all times.

10. Water lines should be conducted to every working face, and hose and attachments should be provided so that water can be applied to the cutter bar of all mining machines, and the face region should be kept in a watered and wet condition at all times, and high-pressure water sprays should be installed at all main partings for wetting loaded trips.

11. All open-type and non-permissible electric machinery should be installed or operated in pure intake air. Only permissible type electrical machinery should be permitted on other than pure intake air.

A measure of protection can be procured if all replacements of electrical machinery be of the permissible type and such permissible equipment be used in places where gas is most likely to be encountered.

12. Men employed as fire bosses should be required to devote their entire time to the inspection of working places and inactive or

abandoned unsealed workings.

13. Permissible explosives, used in a permissible manner, should be used exclusively for shooting coal and rock.

Permissible explosives are used in a permissible manner if the quantity used per shot does not exceed 1-1/2 pounds. It is recommended that the explosives be properly confined in the borehole with incombustible stemming such as fire clay, to the mouth of the borehole; that shots be fired with electric detonators by means of a permissible single shot blasting unit; that shots be not fired in a dangerous percentage of fire damp; that the holes in which the shots are fired be not drilled on the "solid"; that no shot be fired if it is obviously liable to blow out; and that the place in which the shot is to be fired be examined for gas before and after being shot.

Pellet powder, no matter how it is used or fired, is not a permissible explosive, and its ~~use~~ use in this mine should be discontinued.

Consideration should be given to the feasibility of firing all shots from the surface when all men are out of the mine. In any event, shots should be fired by shot-firers, preferably when all other men are out of the mine.

14. Electrical switches should be provided for each section of the mine so that power can be cut off the section when necessary. All abandoned or inactive sections equipped with electrical power should have the power cut off and the switches locked.

Appendix K.- Photomicrographs of coked particles floated from dust samples in affected area, 12 diameters.

APPENDIX F

List of the Fatally Injured and Those Rescued from Behind the Barricade:

Following are the names of those killed in the explosion of November 5, 1930, in Mine No. 6, Sunday Creek Coal Co., near Millfield, Athens County, Ohio:

Ray Andrews	Thomas Harley	Wilbur North
Walter Andryvich	Walter Hayden	Ray Parry
Joe Bergin	John Hillen	Robert Parsons
George Brown	Charles Hoak	John Patterson
Samuel Brown	Urbin Howath	Floyd Petitt
William Brown	Ray Hunter	Thomas Poyatt
Alex Burnick	James Hurd	Wm. Poyatt
Joe Butsko	Joe Jackson	Virgil Phillips
John T. Butsko	Frank Kern	Phil Powell
Delmar Bauer	Andy Kish, Sr.	Abe Rankin
John Bauer	Andy Kish, Jr.	Vernon Roberts
Paul Burdis	George Kish	Carl Robinette
P. A. Coen	Stanley Kish	Charles Sekers
Mike Clancy	William Kish	Harry Syeks
Wm. Clancy	Hubert Lancaster	George Thomas
Andy Cuba	W. E. LeFever	Wm. Tytus
R. Davis	George Love	Andy Tonak
Clyde Dean	James A. Lyons	Thos. B. Trainor
Paul Ervin	John McAllister	H. H. Upson
Phil Ervin	George McClean	Alfred Wade
Silas Ervin	Earl McGee	Luther Wade
Ben Fielder	E. F. McKee	S. M. Wallace
James Gennice	Ed. McManamay	John Weis
George Green	James Martin	John Williams
Charles Grim	Wm. Messinger	Andrew Willis
Miles Grim	John Nadroski	Oscar Willis
James Handa, Sr.	James North	Virgil Willis

The 19 Men Who Were Rescued from Behind the Barricade:

The names of the 19 men who were rescued from behind the barricade, and whether they were taken to the hospital or home, is indicated as follows:

Fifteen men were taken to the Sheltering Arms Hospital,

Athens, Ohio, as follows:

Floyd Ayers	James Hunter
John Cebolo	Chris Parker
Ralph Channel	Edward Parker
Howard Davis	Carl Pickering
John Dean	James Norton
Henry Forsbaugh	James Reinaldo
James Honda	Clifford Watson
Earl Hunter	

One man, Fielden Willis, was taken to the Cherrington Hospital at Logan, Ohio. Three men were taken to their homes, namely, Floyd Crabtree, Robert Cobb, and Harold Phillips. Phillips is the man who walked out without assistance.

APPENDIX C.

1. Description of Mine.

2. Coal Analysis Reports of six face samples of coal.

3. Proximate and ultimate analysis of a composite of the six samples.

Form 6—137

U. S. BUREAU OF MINES

E—DESCRIPTION OF MINE

(1) State Ohio (2) County Athens (3) Town Millfield (Post office.)

(4) Mine sample of Bit. face coal (Material—for coal give classification.) (5) Coal field Hocking (6) District

(7) Mine Sunday Creek #6 (a. Name.) Shaft 187' (b. Kind of opening—if shaft give depth.) 700 ft. (c. Height of opening above sea level.)

East (d. Distance and direction from town.) 5 (e. Sec., T., and R., if necessary.) N.Y.C. (f. Railroad connections.)

Millfield (g. Shipping point.) (h. State if wagon mine or prospect and give distance from shipping point.)

(8) Coal bed Hocking #6 (a. Name.) (b. Geologic system.)

(c. Formation.) (d. Dip, degrees.) (e. Strike, direction.)

(9) Mining system Room & Pillar (Long wall, room and pillar, panels, etc.) (10) Undercutting machine (Hand or machine.)

(11) Explosives pellet powder (a. Used for coal.) (b. Used for roof or floor.)

(12) Operator Sunday Creek Coal Co. Millfield, O (Name and address.)

(13) Sales agent (Name and address.)

(14) Output per day 1500 (Average—gross or net tons.) (15) Maximum day's output (During past year.) (16) Last year's output (Gross or net tons.)

(17) Output from advance workings, per cent (At present.) (18) Lifetime of mine (Years—estimated.)

(19) Run-of-mine, per cent (Of output shipped.) (20) Is coal screened? Yes (21) Type of screens

(22) Type of washer (23) Per cent of coal washed

(24) Maximum size washed (25) Sizes produced (Washed coal.)

(26) Sizes produced (Of coal not washed.) (27) Is coal picked? (State whether on car or belt.)

(28) Per cent of coal coked (At mine.) (29) Sizes coked (Screenings, crushed, washed, etc.)

(30) Type and number of ovens (31) Remarks (For any additional information indicate after subject by mark X if additional information is given here.)

Can Nos. F149 A76, H155, 99444, P 195 & H170, H454 & X28, B937 & F72

(32) ~~Check~~ Nos. 14 dusts A 66127 to A 66140 inclusive (Give Nos. of all samples forwarded.)

(33) Laboratory Nos. A 66120, 121, 124; A 66236, 236, 237 Comp A 66126 (Laboratory to inform immediately by low corresponding lab number.)

(34) Mine sampled at 6 (Number.) points, by Webb, Marshall, Morgan Pgh (Collector.) (Office.) on Nov. 11 13, (Date.) 1930

Above information copied from Card A by McDermott on Nov. 24, 1930 19

6—8372

Form 139

DEPARTMENT OF COMMERCE
BUREAU OF MINES

Test No. _____ G—COAL-ANALYSIS REPORT Lab. No. A 66120 F 148

Sample of Face coal Can No. A 76

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine 21 East off 3 north 15 ft. from face

Method of sampling _____ Gross weight, lbs. _____ Net weight, grams 2095.

Date of sampling 11/11/30 Date of Lab. sampling 11/15/30 Date of analysis 11/21/30

B. of M. or U. S. G. S. section B of M Collector Webb - Morgan

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Air-dry Loss 2.3					
Proximate Analysis	Moisture	7.1	9.3		
	Volatile matter	36.3	35.4	39.1	41.5
	Fixed carbon	51.2	50.0	55.1	58.5
	Ash	5.4	5.3	5.8	
		100.0	100.0	100.0	100.0
Ultimate Analysis	Hydrogen				
	Carbon				
	Nitrogen				
	Oxygen				
	Sulphur	.9	.9	1.0	1.1
	Ash				
Calorific value	Calories	7011	6850	7550	8011
	British thermal units	12620	12330	13590	14420

Softening temperature of ash _____ ° C. 2510 ° F.

Date Nov. 24, 1930 (Signed) H. M. Cooper Chemist.

11—9514 U. S. GOVERNMENT PRINTING OFFICE: 1928

Form 139

DEPARTMENT OF COMMERCE
BUREAU OF MINES

Test No. _____ G—COAL-ANALYSIS REPORT Lab. No. A 66121 99444

Sample of Face coal Can No. H 155

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine 5 north, 60 feet from face

Method of sampling Std Gross weight, lbs. _____ Net weight, grams 2099.

Date of sampling 11/11/30 Date of Lab. sampling 11/15/30 Date of analysis 11/19/30

B. of M. or U. S. G. S. section B of M Collector Webb - Morgan

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Air-dry Loss	2.4				
Proximate Analysis	Moisture	6.5	8.8		
	Volatile matter	36.3	35.5	38.9	41.3
	Fixed carbon	51.7	50.3	55.2	58.7
	Ash	5.5	5.4	5.9	
		100.0	100.0	100.0	100.0
Ultimate Analysis	Hydrogen				
	Carbon				
	Nitrogen				
	Oxygen				
	Sulphur	.6	.6	.6	.7
	Ash				
Calorific value	Calories	7067	6900	7561	8033
	British thermal units	12720	12420	13610	14460

Softening temperature of ash _____ ° C. 2860 ° F.

Date Nov. 24, 1930 (Signed) H. M. Cooper

Chemist.

11—9514 U. S. GOVERNMENT PRINTING OFFICE: 1929

Form 139

DEPARTMENT OF COMMERCE
BUREAU OF MINES

Test No. _____ G—COAL-ANALYSIS REPORT Lab. No. A 66124 A-17

Sample of Face coal Can No. 11

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine 10' from face in 17 W off 6 north

Method of sampling Std Gross weight, lbs. _____ Net weight, grams 2105.

Date of sampling 11/11/30 Date of Lab. sampling 11/15/30 Date of analysis 11/19/30

B. of M. or U. S. G. S. section B of M Collector Webb - Morgan

Air-dry Loss 3.4		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture	6.6	9.8		
	Volatile matter	36.6	35.4	39.2	42.0
	Fixed carbon	50.4	48.7	54.0	58.0
	Ash	6.4	6.1	6.8	
		100.0	100.0	100.0	100.0
Ultimate Analysis	Hydrogen				
	Carbon				
	Nitrogen				
	Oxygen				
	Sulphur	.9	.8	.9	1.0
	Ash				
Calorific value	Calories	6956	6717	7444	7989
	British thermal units	12520	12090	13400	14380

Softening temperature of ash _____ ° C. 2430 ° F.

Date Nov. 24, 1930 (Signed) H. M. Cooper

Chemist.

11—9514 U. S. GOVERNMENT PRINTING OFFICE: 1928

Form 139

DEPARTMENT OF COMMERCE
BUREAU OF MINES

Test No. _____ G—COAL-ANALYSIS REPORT Lab. No. A 66235 & P195

Sample of X Face coal Can No. H170

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine Face of 3 north 30 ft. back from face (fall at face)

Method of sampling Std Gross weight, lbs. _____ Net weight, grams 2144.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis 11/19/30

B. of M. or U. S. G. S. section B of M Collector Webb - Marshall

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Air-dry Loss	1.6				
Proximate Analysis	Moisture	6.2	7.7		
	Volatile matter	36.1	35.5	38.5	41.3
	Fixed carbon	50.2	49.4	53.5	58.2
	Ash	7.5	7.4	8.0	
		100.0	100.0	100.0	100.0
Ultimate Analysis	Hydrogen				
	Carbon				
	Nitrogen				
	Oxygen				
	Sulphur	1.1	1.1	1.2	1.3
	Ash				
Calorific value	Calories	6900	6790	7360	8000
	British thermal units	12420	12220	13250	14400

Softening temperature of ash _____ ° C. 2510 ° F.

Date Nov. 24, 1930 (Signed) E. M. Cooper Chemist.

11—9514 U. S. GOVERNMENT PRINTING OFFICE: 1928

Form 139

DEPARTMENT OF COMMERCE
BUREAU OF MINES

Test No. _____ G—COAL-ANALYSIS REPORT Lab. No. A 66236 H-454

Sample of Face coal Can No. X 28

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine face of main north entry

Method of sampling Std Gross weight, lbs. _____ Net weight, grams 2021.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis 11/29/30

B. of M. or U. S. G. S. section B of M Collector Marshall - Webb

		Air-dry Loss 2.2	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		6.8	8.8		
	Volatile matter		35.4	34.7	38.0	40.3
	Fixed carbon		52.5	51.3	56.3	59.7
	Ash		5.3	5.2	5.7	
			100.0	100.0	100.0	100.0
Ultimate Analysis	Hydrogen					
	Carbon					
	Nitrogen					
	Oxygen					
	Sulphur		.6	.5	.6	.6
	Ash					
Calorific value	Calories		7044	6889	7550	8011
	British thermal units		12680	12400	13590	14420

Softening temperature of ash _____ ° C. 2550 ° F.

Date Nov. 24, 1930 (Signed) H. M. Cooper Chemist.

11—9514 U. S. GOVERNMENT PRINTING OFFICE: 1928

Form 139

DEPARTMENT OF COMMERCE
BUREAU OF MINES

Test No. _____ G—COAL-ANALYSIS REPORT Lab. No. A 66237

Sample of Coal Can No. B 977 F 72

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine 18 east off main north 100 ft. back from outby room 12

Method of sampling Std Gross weight, lbs. _____ Net weight, grams 2120.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis 11/19/30

B. of M. or U. S. G. S. section B of M Collector Webb - Marshall

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Air-dry Loss 1.8					
Proximate Analysis	Moisture	6.1	7.8		
	Volatile matter	36.6	36.0	39.0	42.2
	Fixed carbon	50.2	49.2	53.5	57.8
	Ash	7.1	7.0	7.5	
		100.0	100.0	100.0	100.0
Ultimate Analysis	Hydrogen				
	Carbon				
	Nitrogen				
	Oxygen				
	Sulphur	1.1	1.1	1.2	1.3
	Ash				
Calorific value	Calories	6967	6859	7417	8017
	British thermal units	12540	12310	13350	14430

Softening temperature of ash _____ ° C. 2420 ° F.

Date Nov. 24, 1930 (Signed) H. M. Cooper

Chemist.

11—9514 U. S. GOVERNMENT PRINTING OFFICE: 1928

Form 139

DEPARTMENT OF COMMERCE
BUREAU OF MINES

Test No. _____ G—COAL-ANALYSIS REPORT Lab. No. A 66126

Sample of Bit. face coal Can No. _____

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine Comp of A 66120, 121, 124, A 66836, 255, 257.

Method of sampling _____ Gross weight, lbs. _____ Net weight, grams _____

Date of sampling _____ Date of Lab. sampling _____ Date of analysis 11/19/30

B. of M. or U. S. G. S. section B of M Collector Webb - Marshall

		Air-dry Loss 2.3	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		6.4	8.6		
	Volatile matter		36.1	35.3	38.6	41.3
	Fixed carbon		51.3	50.0	54.8	58.7
	Ash		6.2	6.1	6.6	
			100.0	100.0	100.0	100.0
Ultimate Analysis	Hydrogen		5.4	5.6	5.1	5.4
	Carbon		71.0	69.4	75.9	81.3
	Nitrogen		1.5	1.4	1.5	1.7
	Oxygen		15.0	16.7	10.0	10.6
	Sulphur		.9	.8	.9	1.0
	Ash		6.2	6.1	6.6	
			100.0	100.0	100.0	100.0
Calorific value	Calories		6978	6817	7456	7989
	British thermal units		12560	12270	13420	14380

Softening temperature of ash _____ ° C. _____ ° F.

Date Nov. 24, 1930 (Signed) H. M. Cooper

Chemist.

11—9514 U. S. GOVERNMENT PRINTING OFFICE: 1928

APPENDIX H.

Sampling reports and sections of coal bed at six places.

Form 6—138

Can No. F 148 A 76

U. S. BUREAU OF MINES

F—SAMPLING REPORT

Lab. No. A 66120

(1) State Ohio (2) County Athens (3) Town Millfield (Post office.) (4) Mine Sunday Creek #6

(5) Sample of Face coal (6) Analysis desired

(7) Method of sampling (Describe if other than standard.)

(8) Location in mine 2k ≠ 21 East off 3 north, 15 feet from face (Distance and direction from opening. Locate with respect to rib, room, pillar, aircourse, entry, etc.) (9) Date 11/11/30 (Of sampling.), 19

(10) Coal, dry or moist Dry (11) Gross wt., lbs. (Sample cut.) (12) Net wt., lbs. (Sample mailed.)

(13) Sample from fresh or weathered coal Fresh

(14) Roof bone coal (Kind and quality.)

(15) Draw slate or roof coal 12 to 14" (Description and thickness.)

(16) Floor Fireclay (Kind, soft or hard, smooth or rough.)

(17) Vertical depth from surface to point of sampling, feet

	No.	Section of Bed	Ft.	Ins.	No.	Section of Bed	Ft.	Ins.
	1	Coal		10	10			
x	2	Bone		6	11			
	3	Coal	1	1	12			
x	4	Bone		1-1/2	13			
	5	Coal		11	14			
x	6	Bone		1/2	15			
	7	Coal	1	7	16			
	8				Total thickness of bed		5	1
	9				Thickness in sample		4	5

(18) Excluded from sample, marked X, section Nos. 2, 4, 6

(19) Send analysis to J.J. Forbes (20) Collector Webb - Morgan (21) Office Pittsburgh, Pa.

Above information copied from B card by McDermott on Nov. 17, 1930 19

6—6093

Form 6—138

U. S. BUREAU OF MINES

F—SAMPLING REPORT

Can No. H 155, 99444 Lab. No. A 66121

(1) State Ohio (2) County Athens (3) Town Millfield (Post office.) (4) Mine Sunday Creek No. 6

(5) Sample of Face coal (6) Analysis desired

(7) Method of sampling Std. (Describe if other than standard.)

(8) Location in mine 5 North, 60 feet from face (Distance and direction from opening. Locate with respect to rib, room, pillar, aircourse, entry, etc.) (9) Date Nov. 11, 1930 (Of sampling.)

(10) Coal, dry or moist Moist (11) Gross wt., lbs. (Sample cut.) (12) Net wt., lbs. (Sample mailed.)

(13) Sample from fresh or weathered coal Fresh

(14) Roof Bone coal (Kind and quality.)

(15) Draw slate or roof coal 12 to 14" (Description and thickness.)

(16) Floor Fire clay (Kind, soft or hard, smooth or rough.)

(17) Vertical depth from surface to point of sampling, feet

	No.	Section of Bed	Ft.	Ins.	No.	Section of Bed	Ft.	Ins.
	1	Coal	1	6	10			
x	2	Bone		7	11			
	3	Coal		10	12			
x	4	Bone		1	13			
	5	Coal	2	4	14			
	6				15			
	7				16			
	8					Total thickness of bed	5	4
	9					Thickness in sample	4	8

(18) Excluded from sample, marked X, section Nos. 2, 4

(19) Send analysis to J. J. Forbes (20) Collector Webb - Morgan (21) Office Pittsburgh, Pa.

Above information copied from B card by McDermott on Nov. 17, 1930 19

6—6093

Form 6—138

U. S. BUREAU OF MINES

F—SAMPLING REPORT

Can No. A 17, 11 Lab. No. A 66124

(1) State Ohio (2) County Athens (3) Town Millfield (Post office.) (4) Mine Sunday Creek No. 6

(5) Sample of face coal (6) Analysis desired

(7) Method of sampling Std. (Describe if other than standard.)

(8) Location in mine 10' from face in 17 W. off 6 north (Distance and direction from opening. Locate with respect to rib, room, pillar, aircourse, entry, etc.) (9) Date Nov. 11, 1930 (Of sampling.)

(10) Coal, dry or moist Moist (11) Gross wt., lbs. (Sample cut.) (12) Net wt., lbs. (Sample mailed.)

(13) Sample from fresh or weathered coal Fresh

(14) Roof Bone coal (Kind and quality.)

(15) Draw slate or roof coal 12 to 14" (Description and thickness.)

(16) Floor Fire clay (Kind, soft or hard, smooth or rough.)

(17) Vertical depth from surface to point of sampling, feet

No.	Section of Bed	Ft.	Ins.	No.	Section of Bed	Ft.	Ins.
1	Coal	1		10			
X 2	Bone		11	11			
3	Coal	3	9	12			
4				13			
5				14			
6				15			
7				16			
8				Total thickness of bed		5	8
9				Thickness in sample		4	9

(18) Excluded from sample, marked X, section Nos. 2

(19) Send analysis to J.J. Forbes (20) Collector Webb - Morgan (21) Office Pittsburgh, Pa.

Above information copied from B card by McDermott on Nov. 17, 1930 19

6—8093

Form 6—138 P 195 H 170

U. S. BUREAU OF MINES

A 66235

Can No. _____

F—SAMPLING REPORT

Lab. No. _____

(1) State	(2) County	(3) Town (Post office.)	(4) Mine
Ohio	Athens	Millfield	Sunday Creek No. 6

(5) Sample of face coal (6) Analysis desired Standard

(7) Method of sampling face of 3 north, 30 ft. back from face (fall at face) (Describe if other than standard.)

(8) Location in mine " (Distance and direction from opening. Locate with respect to rib, room, pillar, aircourse, entry, etc.)

(9) Date Nov. 13 30 (Of sampling)

(10) Coal, dry or moist Dry (11) Gross wt., lbs. 24 (Sample cut.) (12) Net wt., lbs. 8 (Sample mailed.)

(13) Sample from fresh or weathered coal fresh

(14) Roof coal (Kind and quality.)

(15) Draw slate or roof coal coal

(16) Floor fireclay, smooth (Description and thickness.)

(Kind, soft or hard, smooth or rough.)

(17) Vertical depth from surface to point of sampling, feet 185

No.		Section of Bed	Ft.	Ins.	No.		Section of Bed	Ft.	Ins.
	1	Coal	1			10			
x	2	Boney		3		11			
	3	Coal		8		12			
x	4	Boney		1/2		13			
	5	Coal		2 3/4		14			
x	6	Boney		1		15			
	7	Coal	1	1/2		16			
x	8	Boney		1/2			Total thickness of bed	4	8-1/4
	9	Coal	1	4			Thickness in sample	4	3-1/4

(18) Excluded from sample, marked X, section Nos. 2,4,6,8

(19) Send analysis to J.J.Forbes (20) Collector Webb & Marshall (21) Office Pittsburgh,

Above information copied from B card by McDermott on Nov. 24, 1930 19

6—6093

Form 6—138

H 454
Can No. X 28

U. S. BUREAU OF MINES
F—SAMPLING REPORT

Lab. No. A 66236

(1) State Ohio (2) County Athens (3) Town Millfield (Post office.) (4) Mine Sunday Creek No. 6

(5) Sample of Face coal (6) Analysis desired

(7) Method of sampling Standard (Describe if other than standard.)

(8) Location in mine Face of main north entry (Distance and direction from opening. Locate with respect to rib, room, piller, aircourse, entry, etc.) (9) Date Nov. 13, 1930 (Of sampling.)

(10) Coal, dry or moist Dry (11) Gross wt., lbs. 24 (Sample cut.) (12) Net wt., lbs. 8 (Sample mailed.)

(13) Sample from fresh or weathered coal fresh

(14) Roof coal (Kind and quality.)

(15) Draw slate or roof coal coal (Description and thickness.)

(16) Floor fire clay (Kind, soft or hard, smooth or rough.)

(17) Vertical depth from surface to point of sampling, feet 190

No.	Section of Bed	Ft.	Ins.	No.	Section of Bed	Ft.	Ins.
1	Coal	1	4	10			
x2	Bony		3-1/2	11			
3	Coal	1		12			
x4	Bony		3/4	13			
5	Coal	2	6	14			
6				15			
7				16			
8					Total thickness of bed	5	2-1/4
9					Thickness in sample	4	10

(18) Excluded from sample, marked X, section Nos. 2, 4

(19) Send analysis to J. J. Forbes (20) Collector Marshall & Webb (21) Office

Above information copied from B card by McDermott on Nov. 24, 1930 19

G—6093

Form 6—138

B-937
F-72
Can No. _____

U. S. BUREAU OF MINES

F—SAMPLING REPORT

Lab. No. A 66237

(1) State Ohio (2) County Athens (3) Town Millfield (Post office.) (4) Mine ~~Sunday Creek~~ Coal Co. #6

(5) Sample of Coal (6) Analysis desired _____

(7) Method of sampling standard (Describe if other than standard.)

(8) Location in mine 18 East off main north 100 ft. back from face room 12 outby (Distance and direction from opening. Locate with respect to rib, room, pillar, aircourse, entry, etc.)

(9) Date 11/13/30 (Of sampling.), 19____

(10) Coal, dry or moist Dry (11) Gross wt., lbs. 24 (Sample cut.) (12) Net wt., lbs. 8 (Sample mailed.)

(13) Sample from fresh or weathered coal fresh

(14) Roof coal (Kind and quality.)

(15) Draw slate or roof coal coal (Description and thickness.)

(16) Floor fire clay - smooth (Kind, soft or hard, smooth or rough.)

(17) Vertical depth from surface to point of sampling, feet 185

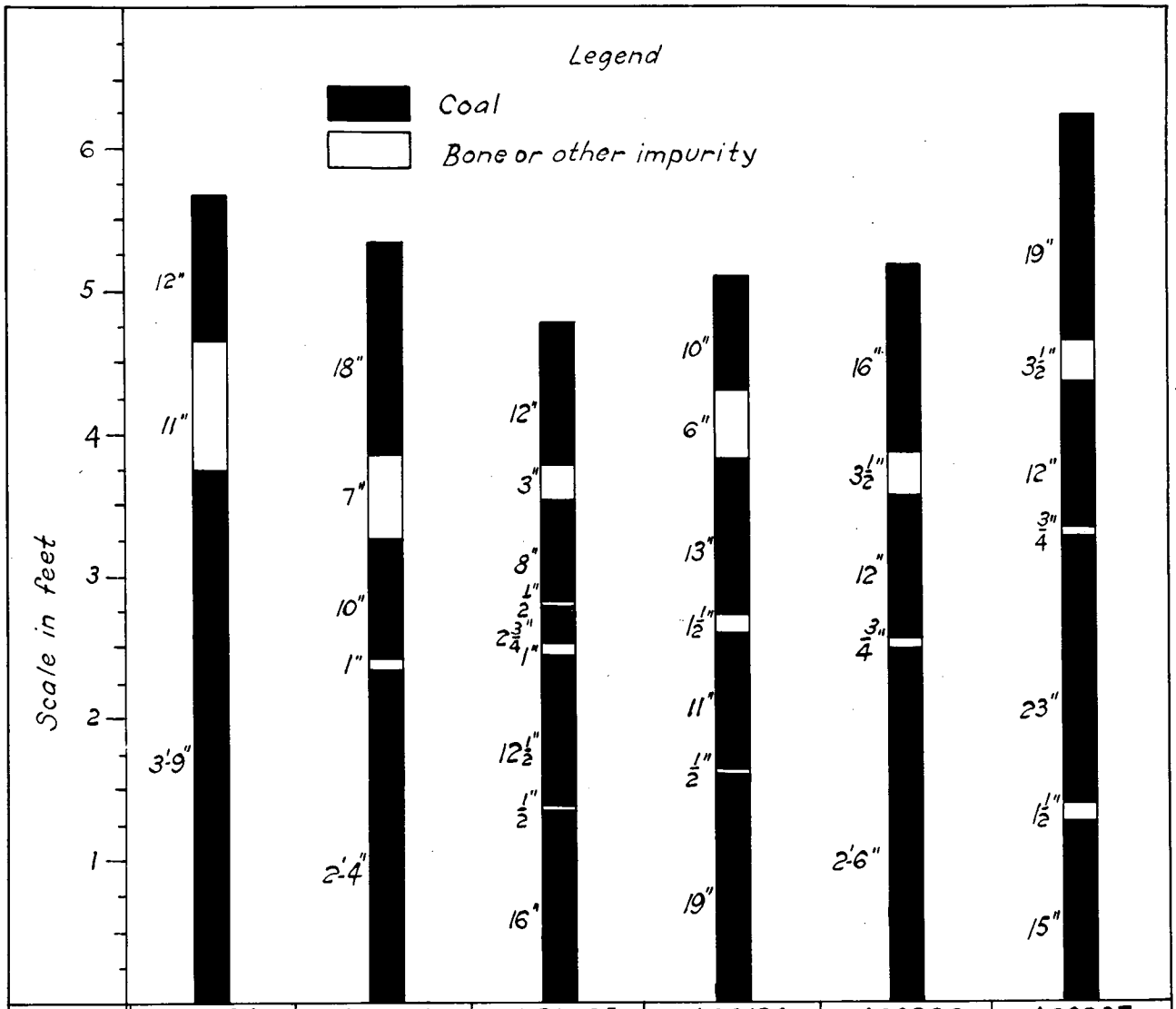
No.	Section of Bed	Ft.	Ins.	No.	Section of Bed	Ft.	Ins.
X 1	Draw slate		6	10			
2	Coal	1	7	11			
X 3	Shale		3-1/2	12			
4	coal	1		13			
X 5	Boney		3/4	14			
6	Coal	1	11	15			
X 7	Boney		1/2	16			
8	Coal	1	3		Total thickness of bed	6	7-3/4
9					Thickness in sample	5	9

(18) Excluded from sample, marked X, section Nos. 1, 3, 5, 7

(19) Send analysis J.J. Forbes (20) Collector JM Webb-JO Marshall Jr (21) Office Pittsburgh, P

Above information copied from B card by McDermott on Nov. 17, 1930 19____

6—6098



Lab. No.	A 66124	A 66121	A 66235	A 66120	A 66236	A 66237
Location where measured	10 feet from face of 17 W. off 6 N.	60 feet from face off 5 N.	60 feet from face off 3 N.	15 feet from face of 21 E. off 3 N.	Face of main N. haulage entry	18 E. off main N. 380 feet in by main N. haulage entry.

Appendix H. Sections of No. 6 bed in mine No. 6, Sunday Creek Coal Co. Millfield Ohio Nov. 1930.

APPENDIX I.

1. Description of Mine.

2. Analytical report of three samples of settled dust.

3. Dust analysis report - composition, fineness, and relative amount of coked particles - of 61 rib and roof, road, and tipple dust samples.

Form 6–137

U. S. BUREAU OF MINES

E—DESCRIPTION OF MINE

(1) State Ohio (2) County Athens (3) Town Millfield (Post office.)

(4) Mine sample of Dust (Material—for coal give classification.) (5) Coal field Hocking Valley (6) District

(7) Mine Sunday Creek #6 (a. Name.) shaft (b. Kind of opening—if shaft give depth.) 187 ft. 700 ft. (c. Height of opening above sea level.)

East (d. Distance and direction from town.) Sec. 5 (e. Sec., T., and R., if necessary.) N.Y.C. (f. Railroad connections.)

Millfield (g. Shipping point.) (h. State if wagon mine or prospect and give distance from shipping point.)

(8) Coal bed Hocking #6 (a. Name.) (b. Geologic system.)

(c. Formation.) (d. Dip, degrees.) (e. Strike, direction.)

(9) Mining system Room & pillar (Long wall, room and pillar, panels, etc.) (10) Undercutting machine (Hand or machine.)

(11) Explosives Pellet Powder (a. Used for coal.) (b. Used for roof or floor.)

(12) Operator Sunday Creek Coal Co. (Name and address.)

(13) Sales agent (Name and address.)

(14) Output per day 1500 T (Average—gross or net tons.) (15) Maximum day's output (During past year.) (16) Last year's output (Gross or net tons.)

(17) Output from advance workings, per cent (At present.) (18) Lifetime of mine (Years—estimated.)

(19) Run-of-mine, per cent (Of output shipped.) (20) Is coal screened? Yes (21) Type of screens shaker

(22) Type of washer (23) Per cent of coal washed

(24) Maximum size washed (25) Sizes produced (Washed coal.)

(26) Sizes produced (Of coal not washed.) (27) Is coal picked? on belt (State whether on car or belt.)

(28) Per cent of coal coked (At mine.) (29) Sizes coked (Screenings, crushed, washed, etc.)

(30) Type and number of ovens (31) Remarks (For any additional information indicate after subject by mark X if additional information is given here.)

X205, X181, B208, 10, 084, 509, F129, 24305, A436, X145, X182, X184, X195, X197 X188, 678, X187, X186, X196, X183, X156, X194, 93049, B502, F19, P328, 272

(32) Can Nos. 03131, 52, X221, X203, X216, X222, X56, B208, H9, X207, X215, X214, X211, F2 X213, P288, X220, H4, X212, X217, Z123, Z124, Z125 (Give Nos. of all samples forwarded.)

(33) Laboratory Nos. A 66238 to A 66284 inc. A 66311 to A 66313 incl. (Laboratory will fill in immediately before dispatching an order.)

(34) Mine sampled at (Number.) points, by (Collector.) (Office.) on (Date.), 19

Above information copied from Card A by on , 19

6—6372

Form 207b

DEPARTMENT OF COMMERCE
BUREAU OF MINES

ANALYTICAL REPORT

Sample No. Z125 Laboratory No. A 66811

Sample of Dust - Face of E1 West off 4 North.

Ohio, Athens County, Millfield Town - Sunday Creek #6 Mine

From Method of sampling:- Brushing surface of dust.

Sample Dry

Sampled Nov. 13, 1930 Received at lab. Nov. 19, 1930 Analyzed

Section or Bureau Mine Ass Collector W.J.Ankeny

ANALYSIS

Coked particles present: Very large amount

Date Nov. 24, 1930 (Signed) H. M. Cooper, Chemist.

Form 207b

DEPARTMENT OF COMMERCE
BUREAU OF MINES

ANALYTICAL REPORT

Can Sample No. Z 124 Laboratory No. A 66512

Sample of Dust from Sunday Creek No. 6 Mine at face of 21 East off 3 north. Town: Millfield, Athens County, Ohio

Brushing surface of dust — Sunday Creek Coal Co.

Sampled Nov. 15, 1930 Received at lab. Nov. 19, 1930 Analyzed

Section or Bureau Mine Aca Collector W.J.Ankeney

ANALYSIS

Coked particles present: Very large amount

Date Nov. 24, 1930 (Signed) H. M. Cooper, Chemist.

Form 207b

DEPARTMENT OF COMMERCE
BUREAU OF MINES

ANALYTICAL REPORT

Sample No. xxxx Z 125 Laboratory No. A 66313

Sample of Dust from the Sunday Creek No. 6 Mine of the Sunday Creek Coal Co., Millfield, Athens County, Ohio. Taken at face of 3 north.

From xxxx Method of sampling: Brushing surface of dust

Sampled Nov. 13, 1930 Received at lab Nov. 19, 1930 Analyzed

Section or Bureau Mine Ass Collector W. J. Ankeny

ANALYSIS

Coked particles present: About 1/2 as much as in A 66311 and A 66312

Date Nov. 24, 1930 (Signed) H. M. Cooper, Chemist.

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66127

Sample of Road dust (through 20-mesh screen). Can No. F 650

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine Between 21 & 22 room 16 West off 4 north

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 1113.0

Date of sampling 11/11/30 Date of Lab. sampling 11/15/30 Date of analysis _____

For B. of M. section Mine Acc Collector Walker - Marshall

	Air-dry Loss 9.3	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture	2.6	11.6		
	Volatile matter Comb	55.3	50.2	56.8	(a)
	Fixed carbon				
	Ash	42.1	38.2	43.2	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	Carbon on 20 mesh		523.4	47.0	
	Nitrogen thru 20 mesh		589.6	53.0	
	Oxygen total wt. of sample		1113.0		
	Sulphur				
	Ash				
Coke particles present: none					
Calorific value determined	Calories		Sample Moist		
	British thermal units				

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	37.4
through 100 mesh	17.5
through 200 mesh	12.9

Area from which sample was taken (sq. ft.) _____

Date, Nov. 21, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66128

Sample of Rib & Roof dust (through 20-mesh screen). Can No. A 416

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine Between 21 & 22 room, 16 west off 4 north

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 448.

Date of sampling 11/11/30 Date of Lab. sampling 11/15/30 Date of analysis _____

For B. of M. section Mine Aac Collector Walker, Marshall

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
	Air-dry Loss 13.0				
Proximate Analysis	Moisture	4.1	16.5		
	[illegible]er Comb	72.0	62.7	75.0	(a)
	Fixed carbon				
	Ash	23.9	20.8	25.0	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	Carbon (on 20 mesh)		188.4	42.1	
	Nitrogen (thru 20 mesh)		259.6	57.9	
	Oxygen (total wt. of sample)		448.0		
	Sulphur				
	Ash				
	Coked particles present: none				
Calorific value determined	Calories		Sample moist		
	British thermal units				

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	41.7
through 100 mesh	19.0
through 200 mesh	11.4

Area from which sample was taken (sq. ft.) _____

Date, Nov. 21, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66129

Sample of Head dust (through 20-mesh screen). Can No. 0-102

Operator Sunday Creek Coal Co Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine On S north, 10 ft. outby 3 breakt thru outby 13 west

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 1182.

Date of sampling 11/11/30 Date of Lab. sampling 11/15/30 Date of analysis _____

For B. of M. section Mine Acc Collector Walker - Marshall

	Air-dry Loss 3.7	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture	1.6	5.3		
	Volatile matter ~~xxxxxx~~ Comb	40.6	39.1	41.3	(a)
	Fixed carbon				
	Ash	57.8	55.6	58.7	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	Carbon (on 20 mesh)		418.6	35.4	
	Nitrogen (thru 20 mesh)		763.4	64.6	
	Oxygen (total wt. of sample)		1182.0		
	Sulphur				
	Ash				
	Coked particles present: trace				
Calorific value determined	Calories		Sample dry		
	British thermal units				

Screen test,		Cumulative per cent.
through 20 mesh		100
through 48 mesh		42.2
through 100 mesh		25.8
through 200 mesh		17.9

Area from which sample was taken (sq. ft.) _____

Date, Nov. 21, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66130

Sample of Rib & Roof dust (through 20-mesh screen). Can No. 334

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine On 3 north 10 ft. outby third break thru outby 13 W

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 393.

Date of sampling 11/11/30 Date of Lab. sampling 11/15/30 Date of analysis _____

For B. of M. section Mine Acc Collector Walker - Marshall

	Air-dry Loss 6.3	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture	3.9	9.9		
	~~Volatile matter~~ Comb	62.4	58.5	64.9	(a)
	Fixed carbon				
	Ash	33.7	31.6	35.1	
		100.0	100.0	100.0	
Ultimate Analysis			Grams	Per Cent	
	Hydrogen				
	on 20 mesh Carbon		163.2	42.6	
	thru 20 mesh Nitrogen		219.8	57.4	
	total wt of sample Oxygen		393.0		
	Sulphur				
	Ash				
	Coked particles present: Trace				
Calorific value determined	Calories		Sample Dry		
	British thermal units				

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	63.1
through 100 mesh	42.0
through 200 mesh	28.7

Area from which sample was taken (sq. ft.) _____

Date, Nov. 21, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66151

Sample of Road dust (through 20-mesh screen). Can No. F 692

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine S west haulage between 2 & 3 North, 25 ft. outby 11 breakthr ourby 3 north

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 636.

Date of sampling 11/11/30 Date of Lab. sampling 11/15/30 Date of analysis _____

For B. of M. section Mine Acc Collector Walker - Marshall

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Air-dry Loss 3.9					
Proximate Analysis	Moisture	2.5	6.4		
	Volatile Comb	59.5	57.1	61.0	(a)
	Fixed carbon				
	Ash	38.0	36.5	39.0	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	Carbon (on 20 mesh)		284.2	44.7	
	Nitrogen (thru 20 mesh)		351.8	55.3	
	Oxygen (total wt. of sample)		636.0		
	Sulphur				
	Ash				
Coked particles present: none					
Calorific value determined	Calories				
	British thermal units		Sample Dry		

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	58.7
through 100 mesh	37.1
through 200 mesh	23.8

Area from which sample was taken (sq. ft.) _____

Date, Nov. 21, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 65132

Sample of Rib & Roof dust (through 20-mesh screen). Can No. H 42

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #5

Town Millfield

Location in mine 8 west haulage between 2 & 3 North, 25 ft. outby 11 breakthru outby 3 North

Method of sampling Std Gross weight, lbs. _____ Net weight, gms 295.

Date of sampling 11/11/30 Date of Lab. sampling 11/15/30 Date of analysis _____

For B. of M. section Mine Acc Collector Walker - Marshall

	Air-dry Loss 4.1	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture	3.8	7.8		
	~~Volatile~~ Comb	54.0	51.7	56.1	(a)
	Fixed carbon				
	Ash	42.2	40.5	43.9	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	Carbon (on 20 mesh)		154.3	52.3	
	Nitrogen (thru 20 mesh)		140.7	47.7	
	Oxygen (total wt. of sample)		295.0		
	Sulphur				
	Ash				
	Coked particles present - Trace				
Calorific value determined	Calories		Sample dry		
	British thermal units				

Screen test, through 20 mesh	Cumulative per cent. 100
through 48 mesh	46.7
through 100 mesh	28.4
through 200 mesh	14.0

Area from which sample was taken (sq. ft.) _____

Date, Nov. 21, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66133

Sample of Road dust (through 20-mesh screen). Can No. P 716

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine Between 20 & 21 room, 15 West off 4 north

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 1147.

Date of sampling 11/11/30 Date of Lab. sampling 11/15/30 Date of analysis _____

For B. of M. section Mine Acc Collector Walker - Marshall

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Air-dry Loss 9.0					
Proximate Analysis	Moisture	2.0	11.8		
	Volatile matter Comb	69.4	63.1	71.5	(a)
	Fixed carbon				
	Ash	27.6	25.1	28.5	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	Carbon on 20 mesh		642.7	56.0	
	Nitrogen thru 20 mesh		504.3	44.0	
	Oxygen total wt. of sample		1147.0		
	Sulphur				
	Ash				
Coked particles present - None					
Calorific value determined	Calories				
	British thermal units		Sample Moist		

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	50.7
through 100 mesh	30.6
through 200 mesh	20.0

Area from which sample was taken (sq. ft.) _____

Date, Nov. 21, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. Rib & Roof — Lab. No. A 66134

Sample of ____ dust (through 20-mesh screen). — Can No. 622

Operator Sunday Creek Coal Co. — Mine Sunday Creek #6

State Ohio — County Athens — Bed Hocking #6

Town Millfield

Location in mine Between 20 & 21 room, 15 west off 4 north

Method of sampling Std — Gross weight, lbs. ____ — Net weight, gms. 406.

Date of sampling 11/11/30 — Date of Lab. sampling 12/15/30 — Date of analysis ____

For B. of M. section Mine Rec — Collector Walker - Marshall

		Air-dry Loss 13.1	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		3.0	15.6		
	~~Volatile matter~~ Comb		72.8	63.4	75.1	(a)
	Fixed carbon					
	Ash		24.2	21.0	24.9	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per Cent	
	Carbon	on 20 mesh		176.0	43.4	
	Nitrogen	thru 20 mesh		230.0	56.6	
	Oxygen	total wt. of sample		406.0		
	Sulphur					
	Ash					
		Coked particles present - None				
Calorific value determined	Calories					
	British thermal units			Sample Moist		

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	36.4
through 100 mesh	19.9
through 200 mesh	12.8

Area from which sample was taken (sq. ft.) ____

Date, Nov. 21, 1930 — (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66135

Sample of Road dust (through 20-mesh screen). Can No. A 215

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine On 4 north outby third breakthru outby 17 West

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 1233.

Date of sampling 11/11/30 Date of Lab. sampling 11/15/30 Date of analysis _____

For B. of M. section Mine Acc Collector Walker - Marshall

		Air-dry Loss 5.4	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		2.3	7.6		
	~~Volatile~~ Comb		50.4	47.7	51.6	(a)
	Fixed carbon					
	Ash		47.3	44.7	48.4	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per Cent	
	Carbon	on 20 mesh		526.6	42.7	
	Nitrogen	thru 20 mesh		706.4	57.3	
	Oxygen	total wt. of sample		1233.0		
	Sulphur					
	Ash					
		Coked particles present - large amount				
Calorific value determined	Calories			Sample Dry		
	British thermal units					

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	48.5
through 100 mesh	26.9
through 200 mesh	14.6

Area from which sample was taken (sq. ft.) _____

Date, Nov. 21, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66136

Sample of Rib & Roof dust (through 20-mesh screen). Can No. E 422

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine On 4 north outby third breakthru outby 17 West

Method of sampling std Gross weight, lbs. _____ Net weight, gms. 196.

Date of sampling 11/11/30 Date of Lab. sampling 11/15/30 Date of analysis _____

For B. of M. section Mine Acc Collector Walker - Marshall

		Air-dry Loss 9.7	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		2.7	12.8		
	~~Volatile~~ Comb		66.0	59.6	67.9	(a)
	Fixed carbon					
	Ash		31.3	28.3	32.1	
			100.0	100.0	100.0	
Ultimate Analysis				Grams	Per Cent	
	Hydrogen					
	Carbon on 20 mesh			12.2	6.2	
	Nitrogen thru 20 mesh			185.8	93.8	
	Oxygen total wt. of sample			196.0		
	Sulphur					
	Ash					
	Coked particles present - large amount					
Calorific value determined	Calories		Sample Dry			
	British thermal units					

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	93.4
through 100 mesh	91.2
through 200 mesh	86.6

Area from which sample was taken (sq. ft.) _____

Date, Nov. 21, 1930 (Signed) R. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 58137

Sample of Road dust (through 20-mesh screen). Can No. C 171

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine Between 9 & 10 room 17 West off 4 north

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 1010.

Date of sampling 11/11/30 Date of Lab. sampling 11/15/30 Date of analysis _____

For B. of M. section Mine Acc Collector Walker - Marshall

	Air-dry Loss 6.2	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture	5.2	9.5		
	~~Volatile matter~~ Comb	80.2	75.1	82.9	(a)
	Fixed carbon				
	Ash	16.6	15.6	17.1	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	on 20 mesh Carbon		530.1	52.4	
	thru 20 mesh Nitrogen		479.9	47.6	
	total wt. of sample Oxygen		1010.0		
	Sulphur				
	Ash				
		Coked particles present - More than 135 & 136			
Calorific value determined	Calories	Sample Dry			
	British thermal units				

Screen test, through 20 mesh	Cumulative per cent. 100
through 48 mesh	54.4
through 100 mesh	35.1
through 200 mesh	22.2

Area from which sample was taken (sq. ft.) _____

Date, Nov. 21, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66138

Sample of Rib & Roof dust (through 20-mesh screen). Can No. D 342

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine Between 9 & 10 room, 17 west off 4 north

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 485.

Date of sampling 11/11/30 Date of Lab. sampling 11/15/30 Date of analysis _____

For B. of M. section Mine Acc Collector Walker - Marshall

	Air-dry Lg. 9	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture	2.9	12.5		
	Volatile matter	77.8	70.1	80.1	(a)
	Fixed carbon				
	Ash	19.3	17.4	19.9	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	Carbon	on 20 mesh	149.8	30.9	
	Nitrogen	thru 20 mesh	335.2	69.1	
	Oxygen	total wt. of sample	485.0		
	Sulphur				
	Ash				
		Coked particles present;	large amount		
Calorific value determined	Calories		Sample dry		
	British thermal units				

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	66.7
through 100 mesh	53.2
through 200 mesh	44.2

Area from which sample was taken (sq. ft.) _____

Date, Nov. 21, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66139

Sample of Road dust (through 20-mesh screen). Can No. B 830

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine 30 ft. inby second breakthru on 4 north inby 20 west

Method of sampling _____ Gross weight, lbs. _____ Net weight, gm. 1154.

Date of sampling 11/11/30 Date of Lab. sampling 11/15/30 Date of analysis _____

For B. of M. section Mine Acc Collector _____

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Air-dry Loss 5.2					
Proximate Analysis	Moisture	2.2	8.2		
	Volatile matter Comb	68.9	65.4	71.2	(a)
	Fixed carbon				
	Ash	27.9	26.4	28.8	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	Carbon on 20 mesh		534.4	50.6	
	Nitrogen thru 20 mesh		569.6	49.4	
	Oxygen total wt. of sample		1154.0		
	Sulphur				
	Ash				
	Coked particles present				
Calorific value determined	Calories		Sample dry		
	British thermal units				

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	46.6
through 100 mesh	26.7
through 200 mesh	15.5

Area from which sample was taken (sq. ft.) _____

Date, Nov. 21, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9388

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66140

Sample of Rib & Roof dust (through 20-mesh screen). Can No. H 134

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine 30 ft. inby second breakthru on 4 north inby 30 West

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 455.

Date of sampling 11/11/30 Date of Lab. sampling 11/15/30 Date of analysis _____

For B. of M. section Mine Ace Collector Walker - Marshall

	Air-dry Loss 18.2	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture	2.9	20.6		
	~~Volatile matter~~ Comb	75.8	62.0	78.1	(a)
	Fixed carbon				
	Ash	21.3	17.4	21.9	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	Carbon (on 20 mesh)		97.9	21.5	
	Nitrogen (thru 20 mesh)		357.1	78.5	
	Oxygen (total wt. of sample)		455.0		
	Sulphur				
	Ash				
	Coked particles present				
Calorific value determined	Calories		Sample Dry		
	British thermal units				

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	73.3
through 100 mesh	56.1
through 200 mesh	50.6

Area from which sample was taken (sq. ft.) _____

Date, Nov. 21, 1930 (Signed) H. M. Cooper, *Chemist.*

a This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66238

Sample of Rib & Roof dust (through 20-mesh screen). Can No. X 222

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine Between 9 & 10 R on 18 W off 4 N

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 591.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Acc Collector Walker - Morgan

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
	Air-dry Loss 9.5				
Proximate Analysis	Moisture	3.5	12.5		
	Volatile matter ~~xxxxxxx~~ Comb	75.6	68.4	78.2	(a)
	Fixed carbon				
	Ash	21.1	19.1	21.8	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	Carbon on 20 mesh		171.2	29.0	
	Nitrogen thru 20 mesh		419.8	71.0	
	Oxygen total wt. of sample		591.0		
	Sulphur				
	Ash				

Coked particles present; not so much as A 66256 & A 66257

Calorific value determined					
	Calories				
	British thermal units		Sample dry		

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	72.9
through 100 mesh	59.1
through 200 mesh	48.3

Area from which sample was taken (sq. ft.) _____

Date, Nov. 21, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES
DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66239

Sample of Road dust (through 20-mesh screen). Can No. X 217

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine between R 9 & 10 off 18W off 4 N

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 1060.

Date of sampling 11/13/30 Date of Lab. sampling 12/11/30 Date of analysis _____

For B. of M. section Mine Acc Collector Walker - Morgan

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
	Air-dry Loss 5.4				
Proximate Analysis	Moisture	2.7	7.9		
	Volatile Comb	53.1	50.3	54.6	(a)
	Fixed carbon				
	Ash	44.2	41.8	45.4	
		100.0	100.0	100.0	
Ultimate Analysis			Grams	Per Cent	
	Hydrogen		on 20 mesh		
	Carbon		446.	42.1	
	Nitrogen		thru 20 mesh		
			614.	57.9	
	Oxygen	total wt. of sample	1060.		
	Sulphur				
	Ash				

Coked particles present: Not as much as A 66256 & A 66257

Calorific value determined	Calories		Sample Dry		
	British thermal units				

Screen test,		Cumulative per cent.
through 20 mesh		100
through 48 mesh		45.8
through 100 mesh		30.0
through 200 mesh		24.8

Area from which sample was taken (sq. ft.) _____

Date, Nov. 21, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66240

Sample of Rib & Roof dust (through 20-mesh screen). Can No. X 56

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine in room 84 off 16 W. off 4 N

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 585.

Date of sampling 11/18/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section mine Acc Collector Walker - Morgan

		Air-dry Loss 9.2	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		3.5	12.4		
	Volatile Comb.		81.9	74.3	84.9	(a)
	Fixed carbon					
	Ash		14.6	13.3	15.1	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per cent	
	Carbon	on 20 mesh		226.9	38.8	
	Nitrogen	thru 20 mesh		358.1	61.2	
	Oxygen	total wt. of sample		585.0		
	Sulphur					
	Ash					

Coked particles present; small amount about 1/2 as much as A 66256 and A 66257

Calorific value determined	Calories			
	British thermal units		Sample Dry	

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	60.2
through 100 mesh	35.0
through 200 mesh	21.0

Area from which sample was taken (sq. ft.) _____

Date, Nov. 21, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES
DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66241

Sample of Read dust (through 20-mesh screen). Can No. X 212

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine In room 2E 24 off 18 W. off 4 N.

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 872.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Ace Collector Walker - Morgan

		Air-dry Loss 5.4	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		3.5	8.7		
	Comb		80.6	76.3	83.6	(a)
	Fixed carbon					
	Ash		15.9	15.0	16.4	
			100.0	100.0	100.0	
Ultimate Analysis				Grams	Per Cent	
	Hydrogen			on 20 mesh		
	Carbon			378.4	43.4	
	Nitrogen			thru 20 mesh 493.6	56.6	
	Oxygen			total wt. of sample 872.0		
	Sulphur					
	Ash					

Coked particles present; small amount, about 1/2 as much as A 66255 and A 66257

Calorific value determined: Calories — Sample dry

British thermal units

Screen test,	Cumulative per cent.
through 20 mesh	100
through 48 mesh	48.5
through 100 mesh	28.6
through 200 mesh	21.9

Area from which sample was taken (sq. ft.) _____

Date, Nov. 22, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66242

Sample of Rib & Roof dust (through 20-mesh screen). Can No. X 208

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine In R 35 off 17 W. off 4 N

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 622.

Date of sampling 11/15/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Acc Collector Walker - Morgan

		Air-dry Loss 8.5	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		2.9	11.2		
	Volatile matter ~~xxxxxx~~ Comb		81.5	74.6	84.0	(a)
	Fixed carbon					
	Ash		15.6	14.2	16.0	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per Cent	
	Carbon on 20 mesh			230.7	37.1	
	Nitrogen thru 20 mesh			391.3	62.9	
	Oxygen total wt. of sample			622.0		
	Sulphur					
	Ash					

Coked particles present; small amount, about 1/2 as much as A 66256 and A 66257

Calorific value determined: Calories _____ British thermal units _____ Sample moist

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	51.9
through 100 mesh	29.2
through 200 mesh	15.8

Area from which sample was taken (sq. ft.) _____

Date, Nov. 22, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66243

Sample of Road dust (through 20-mesh screen). Can No. H 41

Operator Sunday Creek Coal Co. Mine Sunday creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine in room 35 off 17 W. off 4 N

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 942.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Ass Collector Walker - Morgan

		Air-dry Loss 4.6	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		4.1	8.4		
	~~Volatile matter~~ Comb		81.7	78.1	85.2	(a)
	Fixed carbon					
	Ash		14.2	13.5	14.8	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per Cent	
	Carbon	on 20 mesh		518.1	55.0	
	~~Nitrogen~~	thru 20 mesh		423.9	45.0	
	Oxygen	total wt. of sample		942.0		
	Sulphur					
	Ash					

Coked particles present; small amount, about 1/2 as much as A 66256 and A 66257

Calorific value determined	Calories			Sample Moist	
	British thermal units				

Screen test,		Cumulative per cent.
through 20 mesh		100
through 48 mesh		54.2
through 100 mesh		32.3
through 200 mesh		24.8

Area from which sample was taken (sq. ft.) _____

Date, Nov. 22, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66244

Sample of Rib & Roof dust (through 20-mesh screen). Can No. H 9

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine In 17 W. off 4 N. between R 57 and 58

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 686.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Aco Collector Walker - Morgan

		Air-dry Loss 13.7	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		3.7	16.9		
	Volatile matter Comb xxxxxxxx		78.9	68.1	82.0	(a)
	Fixed carbon					
	Ash		17.4	15.0	18.0	
			100.0	100.0	100.0	
Ultimate Analysis				Grams	Per Cent	
	Hydrogen			on 20 mesh		
	Carbon			251.4	36.6	
	Nitrogen			thru 20 mesh		
				434.6	63.4	
	Oxygen			total wt. of sample		
				686.0		
	Sulphur					
	Ash					

Coked particles present; small amount about 1/2 as much as A 66256 and A 66257

Calorific value determined				
	Calories		Sample Moist	
	British thermal units			

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	52.5
through 100 mesh	28.2
through 200 mesh	16.1

Area from which sample was taken (sq. ft.) _____

Date, Nov. 22, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66245

Sample of Road dust (through 20-mesh screen). Can No. X 220

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine in 17 W. off 4 N. between R 57 & 58

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 667.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Ass Collector Walker - Morgan

		Air-dry Loss 8.6	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		3.5	11.3		
	~~Volatile~~ Comb		74.5	68.2	77.3	(a)
	Fixed carbon					
	Ash		21.9	20.0	22.7	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per Cent	
	Carbon	on 20 mesh		412.2	61.8	
	Nitrogen	thru 20 mesh		254.8	38.2	
	Oxygen	total wt. of sample		667.0		
	Sulphur					
	Ash					

Coke particles present; small amount about 1/2 as much as A 66256 and A 66257

Calorific value determined: Calories _____ British thermal units _____ sample moist

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	43.6
through 100 mesh	26.4
through 200 mesh	10.2

Area from which sample was taken (sq. ft.) _____

Date, Nov. 22, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66246

Sample of Rib & Roof dust (through 20-mesh screen). Can No. X 215

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine In 18 W. off 4 N. opposite E 57 in xs 17 W. off 4 N.

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 602.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Acc Collector Walker - Morgan

	Air-dry Loss 13.1	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture	3.3	16.0		
	Volatile matter xxxxxxxx Comb	84.0	72.9	86.8	(a)
	Fixed carbon				
	Ash	12.7	11.1	13.2	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	Carbon on 20 mesh		297.	49.5	
	Nitrogen thru 20 mesh		305.	50.7	
	Oxygen total wt. of sample		602.		
	Sulphur				
	Ash				
	Coked particles present: Few				
Calorific value determined	Calories		Sample Moist		
	British thermal units				

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	51.4
through 100 mesh	30.9
through 200 mesh	29.0

Area from which sample was taken (sq. ft.) _____

Date, Nov. 22, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66247

Sample of Road dust (through 20-mesh screen). Can No. P 288

Operator Sunday / Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine in 18 W. off 4 N. opposite R 57 in 17 W off 4 N

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 722.

Date of sampling 11/18/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Aac Collector Walker - Morgan

		Air-dry Loss 7.1	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		2.7	10.5		
	~~Volatile matter~~ Comb		77.5	72.0	80.4	(a)
	Fixed carbon					
	Ash		18.8	17.5	19.6	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per Cent	
	Carbon	on 20 mesh		406.7	56.3	
	Nitrogen	thru 20 mesh		315.3	43.7	
	Oxygen	total wt. of sample		722.0		
	Sulphur					
	Ash					
Coked particles present: Trace						
Calorific value determined	Calories			Sample Moist		
	British thermal units					

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	30.3
through 100 mesh	21.9
through 200 mesh	12.0

Area from which sample was taken (sq. ft.) _____

Date, Nov. 22, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66248

Sample of Rib & Roof dust (through 20-mesh screen). Can No. X 214

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine on 19 W. inby airshaft

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 730.

Date of sampling xx Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Aco Collector Walker - Morgan

		Air-dry Loss 9.6	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		4.4	13.6		
	~~Volatile~~ Comb		80.9	73.1	84.7	(a)
	Fixed carbon					
	Ash		14.7	13.3	15.3	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per Cent	
	Carbon	on 20 mesh		340.7	46.7	
	Nitrogen	thru 20 mesh		389.3	53.3	
	Oxygen	total wt. of sample		730.0		
	Sulphur					
	Ash					
Coked particles present: None						
Calorific value determined	Calories			Sample Dump		
	British thermal units					

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	49.6
through 100 mesh	39.2
through 200 mesh	18.2

Area from which sample was taken (sq. ft.) _____

Date, Nov. 22, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66249

Sample of Road dust (through 20-mesh screen). Can No. X 213

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine on 19 W. inby airshaft

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 766.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Acc Collector Walker - Morgan

		Air-dry Loss 7.8	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		3.9	11.5		
	~~Volatile~~ Comb		69.6	64.1	72.4	(a)
	Fixed carbon					
	Ash		26.5	24.4	27.6	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per Cent	
	Carbon	on 20 mesh		455.7	59.5	
	Nitrogen	thru 20 mesh		310.3	40.5	
	Oxygen	Total wt. of sample		766.0		
	Sulphur					
	Ash					
		Coked particles present:		Trace		
Calorific value determined	Calories			Sample damp		
	British thermal units					

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	57.9
through 100 mesh	24.4
through 200 mesh	19.5

Area from which sample was taken (sq. ft.) _____

Date, Nov. 21, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66250

Sample of Rib & Roof dust (through 20-mesh screen). Can No. X 211

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine On 19 W between 8 & 9 break thru between 4N & 5 N

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 729.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Aca Collector Walker - Morgan

		Air-dry Loss 8.9	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		5.4	13.9		
	~~Volatile matter~~ Comb		76.4	69.6	80.8	(a)
	Fixed carbon					
	Ash		18.2	16.5	19.2	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per Cent	
	Carbon	on 20 mesh		325.	44.6	
	Nitrogen	thru 20 mesh		404.	55.4	
	Oxygen	total wt. of sample		729.		
	Sulphur					
	Ash					

Coked particles present; small amount, about 1/2 as much as A66256 and A 66257.

Calorific value determined — Calories — Sample Dry

Calorific value determined — British thermal units

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	55.5
through 100 mesh	35.2
through 200 mesh	20.3

Area from which sample was taken (sq. ft.) _____

Date, Nov. 22, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66251

Sample of Rock dust (through 20-mesh screen). Can No. F 2

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine On 19 W between 8 & 9 break thru between 4N & 5 N

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 874.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Ass Collector Walker - Morgan

		Air-dry Loss 6.2	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		4.7	10.6		
	Comb		69.5	65.2	72.9	(a)
	Fixed carbon					
	Ash		25.8	24.2	27.1	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per Cent	
	Carbon	on 20 mesh		536.1	61.3	
	Nitrogen	thru 20 mesh		337.9	38.7	
	Oxygen	total wt. of sample		874.0		
	Sulphur					
	Ash					

Coked particles present; small amount, about 1/2 as much as A 66256 and A 66257

Calorific value determined — Calories _____ British thermal units _____ Sample Dry

Screen test,	Cumulative per cent.
through 20 mesh	100
through 48 mesh	38.2
through 100 mesh	28.8
through 200 mesh	18.7

Area from which sample was taken (sq. ft.) _____

Date, Nov. 22, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66252

Sample of Rib & Roof dust (through 20-mesh screen). Can No. 509

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine Main side track 250 feet inby from shaft

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 355.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Rec Collector Ankeny & Burdelsky

	Air-dry Loss 7.5	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture	2.1	9.3		
	~~Volatile matter~~ Comb	34.4	31.9	35.2	(a)
	Fixed carbon				
	Ash	63.5	58.8	64.8	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	Carbon (on 20 mesh)		56.1	15.8	
	Nitrogen (thru 20 mesh)		298.9	84.2	
	Oxygen (total wt. of sample)		355.0		
	Sulphur				
	Ash				
	Coked particles present: None				
Calorific value determined	Calories		Sample Dry		
	British thermal units				

Screen test,		Cumulative per cent.
through 20 mesh		100
through 48 mesh		63.5
through 100 mesh		41.0
through 200 mesh		27.1

Area from which sample was taken (sq. ft.) _____

Date, Nov. 25, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No._____ Lab. No. A 66253

Sample of Floor dust (through 20-mesh screen). Can No. 0-84

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine Main sidetrack 250 ft. inby from shaft

Method of sampling Std Gross weight, lbs._____ Net weight, gms. 592.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis_____

For B. of M. section Mine Asc Collector Ankeny & Burdelsky

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Air-dry Loss 7.6					
Proximate Analysis	Moisture	2.1	9.5		
	Volatile matter Comb	46.7	43.2	47.7	(a)
	Fixed carbon				
	Ash	51.2	47.3	52.3	
		100.0	100.0	100.0	
			Grams	Per Cent	
Ultimate Analysis	Hydrogen				
	Carbon on 20 mesh		166.6	28.1	
	Nitrogen thru 20 mesh		425.4	71.9	
	Oxygen total wt. of sample		592.0		
	Sulphur				
	Ash				
Coked particles present: None					
Calorific value determined	Calories				
	British thermal units		Sample dry		

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	25.5
through 100 mesh	11.8
through 200 mesh	7.0

Area from which sample was taken (sq. ft.) _____

Date, Nov. 25, 1930 (Signed) H. M. Cooper, *Chemist.*

a This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66254

Sample of Rib & Roof dust (through 20-mesh screen). Can No. 24305

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine Mai n haulage on 12 West 350 ft. inby from main north

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 927.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Ass Collector Ankeny & Burdelsky

		Air-dry Loss 7.0	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		3.2	10.0		
	~~Volatile~~ Comb		49.3	45.9	51.0	(a)
	Fixed carbon					
	Ash		47.5	44.1	49.0	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per Cent	
	Carbon	on 20 mesh		235.5	25.4	
	Nitrogen	thru 20 mesh		691.5	74.6	
	Oxygen	total wt. of sample		927.0		
	Sulphur					
	Ash					
Coked particles present: none						
Calorific value determined	Calories			Sample moist		
	British thermal units					

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	49.0
through 100 mesh	25.3
through 200 mesh	14.8

Area from which sample was taken (sq. ft.) _____

Date, Nov. 25, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66255

Sample of Road dust (through 20-mesh screen). Can No. F 129

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine Main haulabe on 19 West, 350 Feey inby from main north

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 1057.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Acc Collector Ankeny & Burdelsky

	Air-dry Loss 5.3	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture	2.2	7.3		
	~~Volatile matter~~ Comb	32.9	31.3	33.7	(a)
	Fixed carbon				
	Ash	64.9	61.4	66.3	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	Carbon	on 20 mesh	335.8	31.8	
	Nitrogen	thru 20 mesh	721.2	68.2	
	Oxygen	total wt. of sample	1057.0		
	Sulphur				
	Ash				
Coked particles present: Trace					
Calorific value determined	Calories		Sample Moist		
	British thermal units				

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	41.1
through 100 mesh	21.8
through 200 mesh	12.3

Area from which sample was taken (sq. ft.) _____

Date, Nov. 25, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66256

Sample of Rib & Roof dust (through 20-mesh screen). Can No. X 187

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine 22 West off 4 north 500 ft. inby

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 607.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Acc Collector Ankeny & Burdelsky

	Air-dry Loss 9.7	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture	4.2	13.5		
	Volatile matter Comb	80.8	73.0	84.4	(a)
	Fixed carbon				
	Ash	15.0	13.5	15.6	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	on 20 mesh Carbon		151.8	25.0	
	thru 20 mesh Nitrogen		455.2	75.0	
	total wt. of sample Oxygen		607.0		
	Sulphur				
	Ash				
Coked particles present: Large amount					
Calorific value determined	Calories		Sample Moist		
	British thermal units				

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	62.2
through 100 mesh	39.4
through 200 mesh	27.3

Area from which sample was taken (sq. ft.) _____

Date, Nov. 25, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66257

Sample of Rib & Roof dust (through 20-mesh screen). Can No. X 196

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine 22 East off 5 north just inby from 3north

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 621.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Acc Collector Ankeny & Burdelsky

		Air-dry Loss 7.3	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		3.8	10.8		
	~~Volatile matter~~ Comb		79.2	73.4	82.3	(a)
	Fixed carbon					
	Ash		17.0	15.8	17.7	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per Cent	
	Carbon	on 20 mesh		141.2	22.7	
	Nitrogen	thru 20 mesh		479.8	77.3	
	Oxygen	total wt. of sample		621.0		
	Sulphur					
	Ash					
	Coked particles present: large amount					
Calorific value determined	Calories					
	British thermal units			Sample moist		

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	60.2
through 100 mesh	41.2
through 200 mesh	30.4

Area from which sample was taken (sq. ft.) _____

Date, Nov. 25, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66258

Sample of Floor dust (through 20-mesh screen). Can No. X 186

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #5

Town Millfield

Location in mine 22 West off 4 North 500 feet inby

Method of sampling Standard Gross weight, lbs. _____ Net weight, gms. 788.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Acc Collector Ankeny & Burdelsky

	Air-dry Loss 5.6	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture	4.0	9.4		
	~~Volatile~~ Comb	77.9	73.5	81.2	(a)
	Fixed carbon				
	Ash	18.1	17.1	18.8	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	Carbon (on 20 mesh)		294.4	37.4	
	Nitrogen (thru 20 mesh)		493.6	62.6	
	Oxygen (total wt. of sample)		788.0		
	Sulphur				
	Ash				
	Coked particles present: Large amount - not as much as A 66256				
Calorific value determined	Calories		Sample		
	British thermal units				

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	48.8
through 100 mesh	28.7
through 200 mesh	18.4

Area from which sample was taken (sq. ft.) _____

Date, Nov. 25, 1930 (Signed) H. M. Cooper, *Chemist.*

a This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No._____ Lab. No. M 66259

Sample of Rib & Roof dust (through 20-mesh screen). Can No. Y 145

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine Main north haulage 65 feet inby ~~61~~ ½ east

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 502.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Acc Collector Ankeny & Burdelsky

	Air-dry Loss 8.6	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture	4.7	12.9		
	~~Volatile matter~~ Comb	61.8	56.5	64.9	(a)
	Fixed carbon				
	Ash	33.5	30.6	35.1	
		100.0	100.0	100.0	
Ultimate Analysis			Grams	Per Cent	
	Hydrogen				
	Carbon on 20 mesh		138.9	27.7	
	Nitrogen thru 20 mesh		363.1	72.3	
	Oxygen total wt. of sample		502.0		
	Sulphur				
	Ash				
	Coked particles present: None				
Calorific value determined	Calories				
	British thermal units		Sample Dry		

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	55.9
through 100 mesh	34.5
through 200 mesh	19.5

Area from which sample was taken (sq. ft.) _____

Date, Nov. 25, 1930 (Signed) H. M. Cooper, *Chemist.*

a This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66260

Sample of Floor dust (through 20-mesh screen). Can No. A 436

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine Main north haulage 65 ft. inby 16 east

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 1090.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Acc Collector Ankeny & Bardelsky

		Air-dry Loss 4.1	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		8.5	7.5		
	~~Volatile matter~~ Comb		30.5	29.3	31.7	(a)
	Fixed carbon					
	Ash		66.0	63.2	68.3	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per Cent	
	Carbon		on 20 mesh	351.5	32.2	
	Nitrogen		thru 20 mesh	738.5	67.8	
	Oxygen		total wt. of sample	1090.0		
	Sulphur					
	Ash					
	Coked particles present: None					
Calorific value determined	Calories			Sample Dry		
	British thermal units					

Screen test, through 20 mesh	Cumulative per cent. 100
through 48 mesh	53.7
through 100 mesh	35.2
through 200 mesh	21.1

Area from which sample was taken (sq. ft.) _____

Date, Nov. 25, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66261

Sample of Rib & Roof dust (through 20-mesh screen). Can No. X 184

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine On 5 north half way between 20 & 21 east

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 568.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Aso Collector Ankeny & Burdelsky

		Air-dry Loss 8.5	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		4.4	12.5		
	Comb		80.9	74.1	84.7	(a)
	Fixed carbon					
	Ash		14.7	13.4	15.3	
			100.0	100.0	100.0	
Ultimate Analysis				Grams	Per Cent	
	Hydrogen	on 20 mesh				
	Carbon			230.5	40.6	
	Nitrogen	thru 20 mesh		337.5	59.4	
	Oxygen	total wt. of sample		568.0		
	Sulphur					
	Ash					
Coked particles present: none						
Calorific value determined	Calories			Sample moist		
	British thermal units					

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	41.5
through 100 mesh	25.1
through 200 mesh	18.1

Area from which sample was taken (sq. ft.) _____

Date, Nov. 25, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66262

Sample of Floor dust (through 20-mesh screen). Can No. X 182

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine On 5 North half way between 20 & 21 east

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 624.

Date of sampling 11/18/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Acc Collector Ankeny & Burdelsky

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Air-dry Loss 11.2					
Proximate Analysis	Moisture	2.8	14.6		
	~~Volatile~~ Comb	68.2	60.6	70.9	(a)
	Fixed carbon				
	Ash	28.0	24.8	29.1	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	Carbon on 20 mesh		252.3	40.0	
	Nitrogen thru 20 mesh		371.7	60.0	
	Oxygen total wt. of sample		624.0		
	Sulphur				
	Ash				
Coked particles present: none					
Calorific value determined	Calories		Sample moist		
	British thermal units				

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	25.2
through 100 mesh	14.8
through 200 mesh	10.2

Area from which sample was taken (sq. ft.) _____

Date, Nov. 25, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66263

Sample of Rib & Roof dust (through 20-mesh screen). Can No. X 197

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine On 4 north just inby from 20 west

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 488.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Acc Collector Ankeny & Burdsall

		Air-dry Loss 9.4	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		4.2	13.3		
	Volatile matter	XXXXXXX Comb	80.0	72.4	83.5	(a)
	Fixed carbon					
	Ash		15.8	14.3	16.5	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per Cent	
	Carbon	On 20 mesh		138.0	28.3	
	Nitrogen	thru 20 mesh		350.0	71.7	
	Oxygen	total wt. of sample		488.0		
	Sulphur					
	Ash					
	Coked particles present; small amount					
Calorific value determined	Calories					
	British thermal units			Sample Moist		

Screen test,		Cumulative per cent.
through 20 mesh		100
through 48 mesh		49.5
through 100 mesh		33.2
through 200 mesh		23.4

Area from which sample was taken (sq. ft.) _____

Date, Nov. 25, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66264

Sample of Road dust (through 20-mesh screen). Can No. X 195

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine On 4 north just inby from 20 west

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 1052.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Ass Collector Ankeny & Burdelsky

		Air-dry Loss 4.1	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		2.6	6.6		
	~~Volatile~~ Comb		48.9	46.9	50.3	(a)
	Fixed carbon					
	Ash		48.5	46.5	49.7	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per Cent	
	Carbon on 20 mesh			262.7	25.0	
	Nitrogen thru 20 mesh			789.3	75.0	
	Oxygen total wt. of sample			1052.0		
	Sulphur					
	Ash					
	Coked particles present:			Few		
Calorific value determined	Calories			Sample Moist		
	British thermal units					

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	43.6
through 100 mesh	25.2
through 200 mesh	15.2

Area from which sample was taken (sq. ft.) _____

Date, Nov. 25, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No._____ Lab. No. A 66265

Sample of Rib & Roof dust (through 20-mesh screen). Can No. 678

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine 21 West off 4 north, 600 ft. inby

Method of sampling Std. Gross weight, lbs._____ Net weight, gms. 616.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis_____

For B. of M. section Mine Aac Collector Ankeny & Burdelsky

		Air-dry Loss 6.8	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		5.3	13.6		
	Volatile matter ~~xxxxxxx~~ Comb		80.2	73.1	84.7	(a)
	Fixed carbon					
	Ash		14.5	13.3	15.3	
			100.0	100.0	100.0	
				Grams	Per Cent	
Ultimate Analysis	Hydrogen					
	Carbon ~~as~~ 20 mesh			168.8	27.4	
	Nitrogen ~~thru~~ 20 mesh			447.2	72.6	
	Oxygen total wt. of sample			616.0		
	Sulphur					
	Ash					
Coked particles present: Relative small amount						
Calorific value determined	Calories			Sample Moist		
	British thermal units					

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	57.7
through 100 mesh	37.5
through 200 mesh	31.5

Area from which sample was taken (sq. ft.)_____

Date, Nov. 25, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES
DUST-ANALYSIS REPORT

Test No.

Lab. No. A 66266

Sample of Floor dust (through 20-mesh screen).

Can No. X 188

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Meeking #6

Town Millfield

Location in mine 21 West off 4 North 600 feet inby

Method of sampling Std Gross weight, lbs. Net weight, gms. 1105.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis

For B. of M. section Mine Asc Collector Ankeny & Burdelsky

		Air-dry Loss 4.7	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		3.8	8.3		
	Volatile matter Comb		64.7	61.7	67.3	(a)
	Fixed carbon					
	Ash		31.5	30.0	32.7	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per Cent	
	Carbon 20 mesh			369.4	33.4	
	Nitrogen 20 mesh			735.6	66.6	
	Oxygen total wt. of sample			1105.0		
	Sulphur					
	Ash					
	Coked particles present: Relative small amount					
Calorific value determined	Calories					
	British thermal units			Sample Moist		

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	47.7
through 100 mesh	29.7
through 200 mesh	20.0

Area from which sample was taken (sq. ft.)

Date, Nov. 25, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9333

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66267

Sample of Rib & Roof dust (through 20-mesh screen). Can No. I 194

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine 21 East off 3 north just inby from 3 north

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 747.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Asc Collector Ankeny & Burdelsky

	Air-dry Loss 6.7	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture	4.7	11.1		
	Volatile matter Comb	80.9	75.5	84.9	(a)
	Fixed carbon				
	Ash	14.4	13.4	15.1	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per cent	
	Carbon on 20 mesh		211.1	28.3	
	Nitrogen through 20 mesh		535.9	71.7	
	Oxygen total wt. of sample		747.0		
	Sulphur				
	Ash				
		Coked particles present: Relative small amount			
Calorific value determined	Calories		Sample Moist		
	British thermal units				

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	54.6
through 100 mesh	35.6
through 200 mesh	16.9

Area from which sample was taken (sq. ft.) _____

Date, Nov. 25, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66268

Sample of Road dust (through 20-mesh screen). Can No. D 156

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine 21 East off 3 North just inby from 3 north

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 888.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Ass Collector Ankeny & Burdelsky

		Air-dry Loss 4.8	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		4.2	8.9		
	~~Volatile~~ Comb		79.3	75.4	82.7	(a)
	Fixed carbon					
	Ash		16.5	15.7	17.3	
			100.0	100.0	100.0	
Ultimate Analysis				Grams	Per Cent	
	Hydrogen					
	Carbon on 20 mesh			294.2	33.1	
	Nitrogen thru 20 mesh			592.8	66.9	
	Oxygen total wt. of sample			888.0		
	Sulphur					
	Ash					
Coked particles present: Relative small amount						
Calorific value determined	Calories					
	British thermal units			Sample moist		

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	52.9
through 100 mesh	51.5
through 200 mesh	20.7

Area from which sample was taken (sq. ft.) _____

Date, Nov. 25, 1930 (Signed) H. M. Cooper, *Chemist.*

a This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66269

Sample of Rib & Roof dust (through 20-mesh screen). Can No. B 502

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine 19 East off 5 north, 400 ft. inby

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 715.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Aca Collector Ankeny & Burkhart

		Air-dry Loss 8.4	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		4.1	12.2		
	~~Volatile matter~~ Comb		57.5	52.6	59.9	(a)
	Fixed carbon					
	Ash		38.4	35.2	40.1	
			100.0-	100.0	100.0	
Ultimate Analysis				Grams	Per Cent	
	Hydrogen			on 20 mesh		
	Carbon			149.5	20.9	
	Nitrogen			thru 20 mesh		
				565.5	79.1	
	Oxygen			total wt. of sample		
				715.0		
	Sulphur					
	Ash					
	Coked particles present:			Relative small amount		
Calorific value determined	Calories					
	British thermal units			Sample Moist		

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	60.7
through 100 mesh	46.7
through 200 mesh	37.0

Area from which sample was taken (sq. ft.) _____

Date, Nov. 25, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66270

Sample of Road dust (through 20-mesh screen). Can No. 93049

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine 19 East off 3 North 400 ft. ingby

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 1024.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Acc Collector Ankeny & Burdelsky

	Air-dry Loss 7.1	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture	3.1	10.0		
	Volatile matter Comb	38.6	35.9	39.9	(a)
	Fixed carbon				
	Ash	58.3	54.1	60.1	
		100.0	100.0	100.0	
			Grams	Per Cent	
Ultimate Analysis	Hydrogen on 20 mesh				
	Carbon		242.3	23.7	
	Nitrogen thru 20 mesh		781.7	76.3	
	Oxygen total wt. of sample		1024.0		
	Sulphur				
	Ash				
Coked particles present: Large amount					
Calorific value determined	Calories		Sample Moist		
	British thermal units				

Screen test, through 20 mesh	Cumulative per cent. 100
through 48 mesh	49.3
through 100 mesh	30.3
through 200 mesh	19.9

Area from which sample was taken (sq. ft.) _____

Date, Nov. 26, 1930 (Signed) H. M. Cooper Chemist.

a This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66271

Sample of Rib & Roof dust (through 20-mesh screen). Can No. F 19

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine Lower end of side track in 19 West off main north

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 595.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Acc Collector Ankeny & Budelsky

		Air-dry Loss 12.5	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		4.7	16.6		
	[illegible] Comb		64.0	56.0	67.2	(a)
	Fixed carbon					
	Ash		31.3	27.4	32.8	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per Cent	
	Carbon on 20 mesh			66.3	16.9	
	Nitrogen thru 20 mesh			326.7	83.1	
	Oxygen total wt. of sample			393.0		
	Sulphur					
	Ash					
Coked particles present: Large amount						
Calorific value determined	Calories					
	British thermal units			Sample Moist		

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	75.3
through 100 mesh	63.8
through 200 mesh	52.8

Area from which sample was taken (sq. ft.) _____

Date, Nov. 26, 1930 (Signed) H. M. Cooper, *Chemist.*

a This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66272

Sample of Road dust (through 20-mesh screen). Can No. P 328

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine Lower end of sidetrack in 19 West off Main north

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 892.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Acc Collector Ankeny & Burdelsky

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Air-dry Loss 8.0					
Proximate Analysis	Moisture	3.2	10.9		
	Volatile matter ~~xxxxx~~ Comb	37.1	34.2	38.4	(a)
	Fixed carbon				
	Ash	59.7	54.9	61.6	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	Carbon on 20 mesh		302.0	33.9	
	Nitrogen thru 20 mesh		590.0	66.1	
	Oxygen total wt. of sample		892.0		
	Sulphur				
	Ash				
Coked particles present: Large amount					
Calorific value determined	Calories		Sample Moist		
	British thermal units				

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	32.2
through 100 mesh	17.0
through 200 mesh	10.4

Area from which sample was taken (sq. ft.) _____

Date, Nov. 26, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66273

Sample of Rib & Roof dust (through 20-mesh screen). Can No. 272

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine On 19 West, 12 feet inby one north

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 603.

Date of sampling 11/15/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Acc Collector Ankeny & Burdelsky

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Air-dry Loss 6.8					
Proximate Analysis	Moisture	4.3	10.8		
	~~Volatile matter~~ Comb	45.0	42.0	47.1	(a)
	Fixed carbon				
	Ash	~~50.7~~	~~47.2~~	~~52.9~~	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	Carbon (on 20 mesh)		154.5	25.6	
	Nitrogen (thru 20 mesh)		448.5	74.4	
	Oxygen (total wt. of sample)		603.0		
	Sulphur				
	Ash				
Coke particles present: None					
Calorific value determined	Calories		Sample dry		
	British thermal units				

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	65.9
through 100 mesh	49.0
through 200 mesh	40.2

Area from which sample was taken (sq. ft.) _____

Date, Nov. 26, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66274

Sample of Road dust (through 20-mesh screen). Can No. M 03151

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine On 19 West 12 feet inby one north

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 700.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Acc Collector Ankeny & Burdelsky

		Air-dry Loss .6	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		2.7	3.2		
	Volatile Comb		37.6	37.4	38.6	(a)
	Fixed carbon					
	Ash		59.7	59.4	61.4	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per Cent	
	Carbon	on 20 mesh		183.0	26.1	
	Nitrogen	thru 20 mesh		517.0	73.9	
	Oxygen	total wt. of sample		700.0		
	Sulphur					
	Ash					
Coked particles present: Trace						
Calorific value determined	Calories					
	British thermal units			Sample Dry		

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	61.7
through 100 mesh	38.1
through 200 mesh	23.4

Area from which sample was taken (sq. ft.) _____

Date, Nov. 26, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES
DUST-ANALYSIS REPORT

Test No. Rib & Roof — Lab. No. A 66275

Sample of _____ dust (through 20-mesh screen). — Can No. 52

Operator Sunday Creek Coal Co. — Mine Sunday Creek #6

State Ohio — County Athens — Bed Hocking #6

Town Millfield

Location in mine 20 West off 4 north half way between 4 & 5 north

Method of sampling Std — Gross weight, lbs. _____ — Net weight, gms. 639.

Date of sampling 11/13/30 — Date of Lab. sampling 11/19/30 — Date of analysis _____

For B. of M. section Mine Ass — Collector Ankeny & Bardelsky

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Air-dry Loss 12.4					
Proximate Analysis	Moisture	3.8	15.7		
	Volatile matter	76.3	66.9	79.3	(a)
	Fixed carbon				
	Ash	19.9	17.4	20.7	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	Carbon	on 20 mesh	113.0	17.7	
	Nitrogen	thru 20 mesh	526.0	82.3	
	Oxygen	total wt. of sample	639.0		
	Sulphur				
	Ash				
Coked particles present: Large amount					
Calorific value determined	Calories				
	British thermal units		Sample Moist		

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	63.3
through 100 mesh	41.7
through 200 mesh	35.3

Area from which sample was taken (sq. ft.) _____

Date, Nov. 26, 1930 — (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66276

Sample of Road dust (through 20-mesh screen). Can No. X 221

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine 20 West off 4 North half way between 4 & 5 north

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 889.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Ace Collector Ankeny & Burdelsky

	Air-dry Loss 7.2	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture	3.7	10.6		
	Volatile matter Comb	80.1	74.4	83.2	(a)
	Fixed carbon				
	Ash	16.2	15.0	16.8	
		100.0	100.0	100.0	
Ultimate Analysis			Grams	Per Cent	
	Hydrogen				
	Carbon on 20 mesh		241.0	27.1	
	Nitrogen thru 20 mesh		648.0	72.9	
	Oxygen total wt. of sample		889.0		
	Sulphur				
	Ash				
	Coked particles present:		Small amount		
Calorific value determined	Calories				
	British thermal units			Sample moist	

Screen test,		Cumulative per cent.
through 20 mesh		100
through 48 mesh		50.5
through 100 mesh		25.6
through 200 mesh		15.0

Area from which sample was taken (sq. ft.) _____

Date, Nov. 26, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66277

Sample of Rib & Roof dust (through 20-mesh screen). Can No. X 216

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine In 5 N. between 18 & 19 W

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 717.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Aid Collector Ankeny & Burdelsky

	Air-dry Loss 12.6	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture	4.0	16.1		
	~~Volatile matter~~ Comb	79.1	69.1	82.4	(a)
	Fixed carbon				
	Ash	16.9	14.8	17.6	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	Carbon on 20 mesh		347.6	48.5	
	Nitrogen thru 20 mesh		369.4	51.5	
	Oxygen total wt. of sample		717.0		
	Sulphur				
	Ash				
Coked particles present: none					
Calorific value determined	Calories				
	British thermal units		Sample Wet		

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	38.2
through 100 mesh	23.1
through 200 mesh	12.7

Area from which sample was taken (sq. ft.) _____

Date, Nov. 26, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66278

Sample of Road dust (through 20-mesh screen). Can No. X 203

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine in 5 N. between 18 & 19 W.

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 764.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Acc Collector Ankeny & Bardelsky

		Air-dry Loss 12.4	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		4.0	15.9		
	Volatile Comb		66.1	57.9	68.9	(a)
	Fixed carbon					
	Ash		29.9	26.2	31.1	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per Cent	
	Carbon	on 20 mesh		542.4	71.0	
	Nitrogen	thru 20 mesh		221.6	29.0	
	Oxygen	total wt. of sample		764.0		
	Sulphur					
	Ash					
	/ Coked particles present: None			Sample Wet		
Calorific value determined	Calories					
	British thermal units					

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	38.8
through 100 mesh	24.6
through 200 mesh	16.7

Area from which sample was taken (sq. ft.) _____

Date, Nov. 26, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66279

Sample of Rib & Roof dust (through 20-mesh screen). Can No. 10

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine Main north haulage 20 ft. inby 7 West switch

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 361.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Acc Collector Ankeny & Burdelsky

	Air-dry Loss 7.8	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture	3.7	11.2		
	xxxxxxxxx Comb	53.8	49.6	55.9	(a)
	Fixed carbon				
	Ash	42.5	39.2	44.1	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	Carbon (on 20 mesh)		105.1	29.1	
	Nitrogen (thru 20 mesh)		255.9	70.9	
	Oxygen (total wt. of sample)		361.0		
	Sulphur				
	Ash				
Coked particles present: None					
Calorific value determined	Calories		Sample Dry		
	British thermal units				

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	53.8
through 100 mesh	38.6
through 200 mesh	32.5

Area from which sample was taken (sq. ft.) _____

Date, Nov. 26, 1930 (Signed) H. M. Cooper Chemist.

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES
DUST-ANALYSIS REPORT

Test No. Floor — Lab. No. A 66280

Sample of _____ dust (through 20-mesh screen). — Can No. B 208

Operator Sunday Creek Coal Co. — Mine Sunday Creek #6

State Ohio — County Athens — Bed Hocking #6

Town Millfield

Location in mine Main north haulage 20 feet inby 7 West switch

Method of sampling Std — Gross weight, lbs. _____ — Net weight, gms. 985.

Date of sampling 11/13/30 — Date of Lab. sampling 11/19/30 — Date of analysis _____

For B. of M. section Mine Acc — Collector Ankeny & Burdelsky

		Air-dry Loss 7.2	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		2.9	9.9		
	Volatile matter Comb		41.3	38.3	42.5	(a)
	Fixed carbon					
	Ash		55.8	51.8	57.5	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per Cent	
	Carbon	on 20 mesh		341.6	34.7	
	Nitrogen	thru 20 mesh		643.4	65.3	
	Oxygen	total wt. of sample		985.0		
	Sulphur					
	Ash					
Coked particles present: none						
Calorific value determined	Calories			Sample dry		
	British thermal units					

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	33.6
through 100 mesh	15.7
through 200 mesh	8.4

Area from which sample was taken (sq. ft.) _____

Date, Nov. 26, 1930 — (Signed) H. M. Shoper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66281

Sample of Road dust (through 20-mesh screen). Can No. X 183

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine 22 East off 3 north just inby from 3 north

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 842.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Acc Collector Ankeny & Burdelsky

		Air-dry Loss 6.1	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		3.0	8.9		
	~~Volatile matter~~ Comb		76.9	72.3	72.3	(a)
	Fixed carbon					
	Ash		20.1	18.8	20.7	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per Cent	
	Carbon	on 20 mesh		271.4	32.2	
	Nitrogen	thru 20 mesh		570.6	67.8	
	Oxygen	total wt. of sample		842.0		
	Sulphur					
	Ash					
Coked particles present: large amount						
Calorific value determined	Calories			Sample Moist		
	British thermal units					

Screen test, through 20 mesh	Cumulative per cent. 100
through 48 mesh	51.9
through 100 mesh	31.0
through 200 mesh	25.3

Area from which sample was taken (sq. ft.) _____

Date, Nov. 26, 1930 (Signed) M. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66282

Sample of Tipple dust (through 20-mesh screen). Can No. X 205

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine Tipple dust from conveyors, shaker screens

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 776.

Date of sampling 11/14/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section mine Asc Collector Walker

		Air-dry Loss 3.2	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		3.3	6.4		
	Volatile matter Comb		87.8	85.0	90.8	(a)
	Fixed carbon					
	Ash		8.9	8.6	9.2	
			100.0	100.0	100.0	
Ultimate Analysis	Hydrogen			Grams	Per Cent	
	Carbon on 20 mesh			35.2	4.9	
	Nitrogen 20 mesh			737.8	95.1	
	Oxygen tot. wt. of sample			776.0		
	Sulphur					
	Ash					
Coked particles present: None						
Calorific value determined	Calories			Sample Dry		
	British thermal units					

Screen test,		Cumulative per cent.
through 20 mesh		100
through 48 mesh		98.7
through 100 mesh		96.4
through 200 mesh		85.0

Area from which sample was taken (sq. ft.) _____

Date, Nov. 26, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. _____ Lab. No. A 66283

Sample of Grab sample dust (through 20-mesh screen). Can No. X 181

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine Cross bars in 19 west side track opposite sand box

Method of sampling Std Gross weight, lbs. _____ Net weight, gms. 1088.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Acc Collector Ankeny & Kurdelsky

		Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Air-dry Loss 3.8					
Proximate Analysis	Moisture	3.2	6.8		
	~~Volatile~~ Comb	74.8	72.0	77.3	(a)
	Fixed carbon				
	Ash	22.0	21.2	22.7	
		100.0	100.0	100.0	
Ultimate Analysis	Hydrogen		Grams	Per Cent	
	Carbon (on 20 mesh)		57.2	5.3	
	Nitrogen (thru 20 mesh)		1030.8	94.7	
	Oxygen (total wt. of sample)		1088.0		
	Sulphur				
	Ash				
Coked particles present: small amount					
Calorific value determined	Calories				
	British thermal units		Sample Dry		

	Cumulative per cent.
Screen test, through 20 mesh	100
through 48 mesh	79.7
through 100 mesh	63.5
through 200 mesh	45.7

Area from which sample was taken (sq. ft.) _____

Date, Nov. 26, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

Form 261

DEPARTMENT OF COMMERCE
BUREAU OF MINES

DUST-ANALYSIS REPORT

Test No. Grab * Lab. No. A 66284

Sample of _____ dust (through 20-mesh screen). Can No. X 207

Operator Sunday Creek Coal Co. Mine Sunday Creek #6

State Ohio County Athens Bed Hocking #6

Town Millfield

Location in mine In 20 W. of 6 N. in neck of room 11

Method of sampling _____ Gross weight, lbs. _____ Net weight, gms. 948.

Date of sampling 11/13/30 Date of Lab. sampling 11/19/30 Date of analysis _____

For B. of M. section Mine Acc Collector Walker - Morgan

		Air-dry Loss 3.9	Coal (Air dried)	Coal (As received)	Coal (Moisture free)	Coal (Moisture and ash free)
Proximate Analysis	Moisture		3.2	7.0		
	xxxxxxxxx Comb Volatile matter		85.2	81.9	88.0	(a)
	Fixed carbon					
	Ash		11.6	11.1	12.0	
			100.0	100.0	100.0	
Ultimate Analysis				Grams	Per Cent	
	Hydrogen on 20 mesh					
	Carbon thru 20 mesh			564.	59.5	
	Nitrogen			384.	40.5	
	total wt. of sample			948.		
	Oxygen					
	Sulphur					
	Ash					
	Coked particles present: None					
Calorific value determined	Calories		*Arowall cuttings in bone coal			
	British thermal units			Sample		

Screen test, through 20 mesh	Cumulative per cent. 100
through 48 mesh	38.3
through 100 mesh	19.4
through 200 mesh	10.2

Area from which sample was taken (sq. ft.) _____

Date, Nov. 26, 1930 (Signed) H. M. Cooper, *Chemist.*

[a] This figure is the ratio of volatile combustible to total combustible.

11—9383

APPENDIX J.

Mine air analyses reports.

DEPARTMENT OF COMMERCE
BUREAU OF MINES

GAS ANALYSIS REPORT

Bottle No. 274-282 Laboratory No. 53150-53151

Sample of Mine Air

Mine #6 Operator Sunday Creek Coal Co.

State Ohio County Athens Township

Town (distance and direction from, and railroad)

Name of coal bed Sec., T., R.

Location in mine 4 N at 21 W. Switch

Method of sampling Vacuum Date sampled 11/9/30 Hour 8:15 A.M.

Velocity 156 Area 14 x 5.5 Quantity 12012

Barometer: Inside Outside

Corrected to sea level: Inside Outside

Bulbs: Wet Dry Humidity %

Collector Mailed Received

Laboratory No.	53150	53151	Ethane (C_2H_6)		
	274	282			
Carbon dioxide (CO_2)	.14	.12	Hydrogen sulphide (H_2S)		
Oxygen (O_2)	20.18	20.16	Unsaturated hydrocarbons (C_2H_4, etc.).		
Hydrogen (H_2)					
Carbon monoxide (CO)			Sulphur dioxide (SO_2)		
Methane (CH_4)	.14	.17			
Nitrogen (N_2)	79.54	79.55			
Total	100.00	100.00			

Remarks:

Date 11/28/30 (Signed) W. P. Yant

Chemist.

Form 213 11—8890 GOVERNMENT PRINTING OFFICE

DEPARTMENT OF COMMERCE
BUREAU OF MINES

GAS ANALYSIS REPORT

Bottle No. 653-654 Laboratory No. 53153-53154

Sample of Mine Air

Mine #6 Operator Sunday Creek Coal Co.

State Ohio County Athens Township

Town (distance and direction from, and railroad) Millfield

Name of coal bed Hocking #6 Sec. , T. , R.

Location in mine Return from East Split on 20 feet off main North 300 feet inby.

Method of sampling Vacuum Date sampled 11/11/30 Hour 8:30 A.M.

Velocity Area Quantity 5775

Barometer: Inside 30.4 Outside 30.75

Corrected to sea level: Inside Outside

Bulbs: Wet 58 Dry 58 Humidity 94 %

Collector M. J. Asbury, Asst. Mine Safety Engr. Mailed Received 11/13/30

Laboratory No.	53153 653	53154 654			
Carbon dioxide (CO_2)	.11	.11	Ethane (C_2H_6)		
Oxygen (O_2)	20.64	20.67	Hydrogen sulphide (H_2S)		
Hydrogen (H_2)			Unsaturated hydrocarbons (C_2H_4, etc.)		
Carbon monoxide (CO)			Sulphur dioxide (SO_2)		
Methane (CH_4)	.39	.26			
Nitrogen (N_2)	78.86	78.96			
Total	100.00	100.00			

Remarks:

Date 11/28/30 (Signed) W. P. Yant
Chemist.

Form 213 11—8890 GOVERNMENT PRINTING OFFICE

DEPARTMENT OF COMMERCE
BUREAU OF MINES

GAS ANALYSIS REPORT

Bottle No. 369 Laboratory No. 55154

Sample of Mine Air

Mine #6 Operator Sunday Creek Coal Co.

State Ohio County Athens Township

Town (distance and direction from, and railroad) Millfield

Name of coal bed Meigs #6 Sec. , T. , R.

Location in mine Return from West Split on 19 West off Main North 900 feet inby.

Method of sampling Vacuum Date sampled 11/11/30 Hour 8:30 P.M.

Velocity 60 Area 85.8 Quantity 4,200

Barometer: Inside 30.4 Outside 30.75

Corrected to sea level: Inside Outside

Bulbs: Wet 68 Dry 59 Humidity 94 %

Collector M. J. Aubrey Mailed Received 11/13/30
Asst. Mine Safety Engr.

Laboratory No.	55154 369		Ethane (C_2H_6)		
Carbon dioxide (CO_2)	.16		Hydrogen sulphide (H_2S)		
Oxygen (O_2)	20.22		Unsaturated hydrocarbons (C_2H_4, etc.)		
Hydrogen (H_2)					
Carbon monoxide (CO)			Sulphur dioxide (SO_2)		
Methane (CH_4)	.23				
Nitrogen (N_2)	79.39				
Total	100.00				

Remarks:

Date 11/28/30 (Signed) W. P. Yant
Chemist.

Form 213 11—8890
GOVERNMENT PRINTING OFFICE

DEPARTMENT OF COMMERCE
BUREAU OF MINES

GAS ANALYSIS REPORT

Bottle No. 270 Laboratory No. 53155

Sample of Mine Air

Mine #6 Operator Sunday Creek Coal Co.

State Ohio County Athens Township

Town (distance and direction from, and railroad) Millfield

Name of coal bed Meeking #6 Sec. , T. , R.

Location in mine Return from West Split on 19 West off Main North 900 feet inby.

Method of sampling Vacuum Date sampled 11/11/30 Hour 8:50 A.M.

Velocity 50 Area 95.8 Quantity 4,290

Barometer: Inside 28.4 Outside 29.75

Corrected to sea level: Inside Outside

Bulbs: Wet 58 Dry 59 Humidity 94 %

Collector M. J. Aubrey, Asst. Mine Safety Engr. Mailed Received 11/15/30

Laboratory No.	53155 270		Ethane (C_2H_6)		
Carbon dioxide (CO_2)	.19		Hydrogen sulphide (H_2S)		
Oxygen (O_2)	20.36		Unsaturated hydrocarbons (C_2H_4, etc.).		
Hydrogen (H_2)					
Carbon monoxide (CO)			Sulphur dioxide (SO_2)		
Methane (CH_4)	.23				
Nitrogen (N_2)	79.22				
Total	100.00				

This report is CONFIDENTIAL NOT FOR PUBLICATION OR CIRCULATION without special permit from the Director of the Bureau of Mines. Not to be used in the exploitation of any process or product.

Remarks:

Date 11/28/30 (Signed) W. P. Yant *Chemist.*

Form 213 11—8890

GOVERNMENT PRINTING OFFICE

DEPARTMENT OF COMMERCE
BUREAU OF MINES

GAS ANALYSIS REPORT

Bottle No. 263-268 Laboratory No. 53186-53187

Sample of Mine Air

Mine #6 Operator Sunday Creek Coal Co.

State Ohio County Athens Township

Town (distance and direction from, and railroad) Millfield

Name of coal bed Sec. , T. , R.

Location in mine 2 N. 25 feet subby 21 W.

Method of sampling Vacuum Date sampled 11/8/30 Hour 9:30 A.M.

Velocity 160 Area 13 x 5.5 Quantity 11360

Barometer: Inside Outside

Corrected to sea level: Inside Outside

Bulbs: Wet Dry Humidity %

Collector W.H. Thomkinson Mailed Received 11/13/30

Laboratory No.	53186 263	53187 268	Ethane (C_2H_6)		
Carbon dioxide (CO_2)	.14	.14	Hydrogen sulphide (H_2S)		
Oxygen (O_2)	20.37	20.51	Unsaturated hydrocarbons (C_2H_4, etc.).		
Hydrogen (H_2)					
Carbon monoxide (CO)			Sulphur dioxide (SO_2)		
Methane (CH_4)	.20	.19			
Nitrogen (N_2)	79.29	79.16			
Total	100.00	100.00			

Remarks:

Date 11/28/30 (Signed) W. P. Yant *Chemist.*

Form 213 11—8890

GOVERNMENT PRINTING OFFICE

DEPARTMENT OF COMMERCE
BUREAU OF MINES

GAS ANALYSIS REPORT

Bottle No. 652 Laboratory No. 55158

Sample of Mine Air

Mine #6 Operator Sunday Creek Coal Co.

State Ohio County Athens Township

Town (distance and direction from, and railroad) Millfield

Name of coal bed Hocking #6 Sec. , T. , R.

Location in mine Face of 17 West off 4 North

Method of sampling Vacuum Date sampled 11/11/30 Hour 11:40 A.M.

Velocity Area Quantity

Barometer: Inside 30.4 Outside 30.75

Corrected to sea level: Inside Outside

Bulbs: Wet 58 Dry 58 Humidity 100 %

Collector M. J. Aubrey, Asst. Mine Safety Engr. Mailed Received 11/13/30

Laboratory No.	55158 652		Ethane (C_2H_6)		
Carbon dioxide (CO_2)	.50		Hydrogen sulphide (H_2S)		
Oxygen (O_2)	20.20		Unsaturated hydrocarbons (C_2H_4, etc.).		
Hydrogen (H_2)					
Carbon monoxide (CO)			Sulphur dioxide (SO_2)		
Methane (CH_4)	.15				
Nitrogen (N_2)	79.15				
Total	100.00				

This report is ~~CONFIDENTIAL NOT FOR PUBLICATION OR CIRCULATION~~ without special permit from the Director of the Bureau of Mines. Not to be used in the exploitation of any process or product.

Remarks:

Date 11/28/30 (Signed) W. P. Yant, Chemist.

Form 213 11—8890 GOVERNMENT PRINTING OFFICE

DEPARTMENT OF COMMERCE
BUREAU OF MINES

GAS ANALYSIS REPORT

Bottle No. 681 Laboratory No. 83159

Sample of Mine Air

Mine #6 Operator Sunday Creek Coal Co.

State Ohio County Athens Township

Town (distance and direction from, and railroad) Millfield

Name of coal bed Meigs #6 Sec. , T. , R.

Location in mine Face of 20 Yent off 6 North

Method of sampling Vacuum Date sampled 11/11/30 Hour 12:05 P.M.

Velocity Area Quantity

Barometer: Inside 30.4 Outside 30.75

Corrected to sea level: Inside Outside

Bulbs: Wet 58 Dry 58 Humidity 100 %

Collector M. J. Ainey, Asst. Mine Safety Engr. Mailed Received 11/13/30

Laboratory No.	83159 681		Ethane (C_2H_6)		
Carbon dioxide (CO_2)	.30		Hydrogen sulphide (H_2S)		
Oxygen (O_2)	20.33		Unsaturated hydrocarbons (C_2H_4, etc.).		
Hydrogen (H_2)					
Carbon monoxide (CO)			Sulphur dioxide (SO_2)		
Methane (CH_4)	.42				
Nitrogen (N_2)	79.05				
Total	100.00				

This report is CONFIDENTIAL NOT FOR PUBLICATION OR CIRCULATION without special permit from the Director of the Bureau of Mines. Not to be used in the exploitation of any process or product.

Remarks:

Date 11/28/30 (Signed) W. P. Yant, Chemist.

Form 213 11—8890

GOVERNMENT PRINTING OFFICE

DEPARTMENT OF COMMERCE
BUREAU OF MINES

GAS ANALYSIS REPORT

Bottle No. 275 Laboratory No. 55160

Sample of Mine Air

Mine #6 Operator Sunday Creek Coal Co.

State Ohio County Athens Township

Town (distance and direction from, and railroad) Millfield

Name of coal bed Kooking #6 Sec. , T. , R.

Location in mine Face of 3 North

Method of sampling Vacuum Date sampled 11/11/30 Hour 10:10 A.M.

Velocity Area Quantity

Barometer: Inside 30.4 Outside 30.75

Corrected to sea level: Inside Outside

Bulbs: Wet 58 Dry 58.5 Humidity 98 %

Collector M. J. Ashley, Asst. Mine Safety Engr. Mailed Received 11/13/30

Laboratory No.	55160 275		Ethane (C_2H_6)		
Carbon dioxide (CO_2)	.10		Hydrogen sulphide (H_2S)		
Oxygen (O_2)	20.35		Unsaturated hydrocarbons (C_2H_4, etc.).		
Hydrogen (H_2)					
Carbon monoxide (CO)			Sulphur dioxide (SO_2)		
Methane (CH_4)	.25				
Nitrogen (N_2)	79.30				
Total	100.00				

This report is CONFIDENTIAL NOT FOR PUBLICATION OR CIRCULATION without special permit from the Director of the Bureau of Mines. Not to be used in the exploitation of any process or product.

Remarks:

Date 11/28/30 (Signed) W. P. Yant, Chemist.

Form 213 11—8890

GOVERNMENT PRINTING OFFICE

DEPARTMENT OF COMMERCE
BUREAU OF MINES

GAS ANALYSIS REPORT

Bottle No. 271 Laboratory No. 53161

Sample of Mine Air

Mine #6 Operator Sunday Creek Coal Co.

State Ohio County Athens Township

Town (distance and direction from, and railroad) Millfield

Name of coal bed Hocking #6 Sec. , T. , R.

Location in mine Face of 22 Heat off 4 North.

Method of sampling Vacuum Date sampled 11/11/30 Hour 10:30 A.M.

Velocity Area Quantity

Barometer: Inside 30.4 Outside 30.75

Corrected to sea level: Inside Outside

Bulbs: Wet 58.5 Dry 49 Humidity 98 %

Collector Asst. Mine Safety Engr. Mailed Received 11/13/30

Laboratory No.	53161 271		Ethane (C_2H_6)		
Carbon dioxide (CO_2)	.21		Hydrogen sulphide (H_2S)		
Oxygen (O_2)	20.36		Unsaturated hydrocarbons (C_2H_4, etc.).		
Hydrogen (H_2)					
Carbon monoxide (CO)			Sulphur dioxide (SO_2)		
Methane (CH_4)	.17				
Nitrogen (N_2)	79.27				
Total	100.00				

This report is CONFIDENTIAL NOT FOR PUBLICATION OR CIRCULATION without special permit from the Director of the Bureau of Mines. Not to be used in the exploitation of any process or product.

Remarks:

Date 11/28/30 (Signed) W. P. Yant, *Chemist.*

Form 213 11—8890

GOVERNMENT PRINTING OFFICE

DEPARTMENT OF COMMERCE
BUREAU OF MINES

GAS ANALYSIS REPORT

Bottle No. 886 Laboratory No. 53163

Sample of Mine Air

Mine #6 Operator Sunday Creek Coal Co.

State Ohio County Athens Township

Town (distance and direction from, and railroad) Millfield

Name of coal bed Hocking #6 Sec. , T. , R.

Location in mine On 4 North just inby 20 Yest

Method of sampling Vacuum Date sampled 11/11/30 Hour 10:40 A.M.

Velocity 145 Area 76.6 Quantity 10.982

Barometer: Inside 30.4 Outside 30.75

Corrected to sea level: Inside Outside

Bulbs: Wet 58 Dry 58.5 Humidity 94 %

Collector M. J. Ankney, Asst. Mine Safety Engr. Mailed Received 11/13/30

Laboratory No.	53163 886	Ethane (C_2H_6)	
Carbon dioxide (CO_2)	.17	Hydrogen sulphide (H_2S)	
Oxygen (O_2)	20.42	Unsaturated hydrocarbons (C_2H_4, etc.).	
Hydrogen (H_2)			
Carbon monoxide (CO)		Sulphur dioxide (SO_2)	
Methane (CH_4)	.15		
Nitrogen (N_2)	79.26		
Total	100.00		

Remarks:

Date 11/28/30 (Signed) W. P. Yant, *Chemist.*

Form 213 11—8890 GOVERNMENT PRINTING OFFICE

DEPARTMENT OF COMMERCE
BUREAU OF MINES

GAS ANALYSIS REPORT

Bottle No. 595 Laboratory No. 85163

Sample of Mine Air

Mine #6 Operator Sunday Creek Coal Co.

State Ohio County Athens Township

Town (distance and direction from, and railroad) Millfield

Name of coal bed Hocking #6 Sec. , T. , R.

Location in mine On 17 West off 4 North just inby from 4 North.

Method of sampling Vacuum Date sampled 11/11/30 Hour 12:05 A.M.

Velocity 125 Area 72 Quantity 9,000

Barometer: Inside 30.4 Outside 30.75

Corrected to sea level: Inside Outside

Bulbs: Wet 58.5 Dry 59 Humidity 98.5 %

Collector M. J. Ankney, Asst. Mine Safety Engr. Mailed Received 11/13/30

Laboratory No.	85163 595	Ethane (C_2H_6)	
Carbon dioxide (CO_2)	.15	Hydrogen sulphide (H_2S)	
Oxygen (O_2)	20.85	Unsaturated hydrocarbons (C_2H_4, etc.).	
Hydrogen (H_2)			
Carbon monoxide (CO)		Sulphur dioxide (SO_2)	
Methane (CH_4)	.10		
Nitrogen (N_2)	78.90		
Total	100.00		

This report is CONFIDENTIAL NOT FOR PUBLICATION OR CIRCULATION, without special permit from the Director of the Bureau of Mines. Not to be used in the exploitation of any process or product.

Remarks:

Date 11/28/30 (Signed) W. P. Yant, *Chemist.*

Form 213 11—8890

GOVERNMENT PRINTING OFFICE

DEPARTMENT OF COMMERCE
BUREAU OF MINES

GAS ANALYSIS REPORT

Bottle No. 267 Laboratory No. 55164

Sample of Mine Air

Mine #6 Operator Sunday Creek Coal Co.

State Ohio County Athens Township

Town (distance and direction from, and railroad) Millfield

Name of coal bed Hocking #6 Sec. , T. , R.

Location in mine On 15 West off 2 North just inby 4 North.

Method of sampling Vacuum Date sampled 11/11/30 Hour 1:55 P. M.

Velocity 120 Area 78 Quantity 9360

Barometer: Inside 30.4 Outside 30.75

Corrected to sea level: Inside Outside

Bulbs: Wet 58.5 Dry 59.5 Humidity 94 %

Collector M. J. Ankney, Asst. Mine Safety Engr. Mailed Received 11/13/30

Laboratory No.	55164 267		Ethane (C_2H_6)		
Carbon dioxide (CO_2)	.28		Hydrogen sulphide (H_2S)		
Oxygen (O_2)	20.34		Unsaturated hydrocarbons (C_2H_4, etc.).		
Hydrogen (H_2)					
Carbon monoxide (CO)			Sulphur dioxide (SO_2)		
Methane (CH_4)	.13				
Nitrogen (N_2)	79.21				
Total	100.00				

This report is CONFIDENTIAL NOT FOR PUBLICATION OR CIRCULATION without special permit from the Director of the Bureau of Mines. Not to be used in the application of any process or product.

Remarks:

Date 11/28/30 (Signed) W. P. Yant, Chemist.

Form 213 11—8890 GOVERNMENT PRINTING OFFICE

DEPARTMENT OF COMMERCE
BUREAU OF MINES

GAS ANALYSIS REPORT

Bottle No. 266 Laboratory No. 83165

Sample of Mine Air

Mine #6 Operator Sunday Creek Coal Co.

State Ohio County Athens Township

Town (distance and direction from, and railroad) Millfield

Name of coal bed Hocking #6 Sec. , T. , R.

Location in mine 13 West off 4 North just inby 4 North.

Method of sampling Vacuum Date sampled 11/11/30 Hour 3:10 P. M.

Velocity 205 Area 45 Quantity 9,225

Barometer: Inside 30.4 Outside 30.75

Corrected to sea level: Inside Outside

Bulbs: Wet 53.5 Dry 54 Humidity 91 %

Collector M. J. Ankney, Asst. Mine Safety Engr. Mailed Received 11/15/30

Laboratory No.	83165 266		Ethane (C_2H_6)		
Carbon dioxide (CO_2)	.06		Hydrogen sulphide (H_2S)		
Oxygen (O_2)	20.86		Unsaturated hydrocarbons (C_2H_4, etc.)		
Hydrogen (H_2)					
Carbon monoxide (CO)			Sulphur dioxide (SO_2)		
Methane (CH_4)	.00				
Nitrogen (N_2)	79.08				
Total	100.00				

This report is CONFIDENTIAL NOT FOR PUBLICATION OR CIRCULATION without special permit from the Director of the Bureau of Mines. Not to be used in the exploitation of any process or product.

Remarks:

Date 11/28/30 (Signed) W. P. Yant, Chemist.

Form 213 11—8890 GOVERNMENT PRINTING OFFICE

DEPARTMENT OF COMMERCE
BUREAU OF MINES

GAS ANALYSIS REPORT

Bottle No. 282 Laboratory No. 53166

Sample of Mine Air

Mine Sunday Creek #6 Operator Sunday Creek Coal Co.

State Ohio County Athens Township

Town (distance and direction from, and railroad) Millfield

Name of coal bed #6 Sec. , T. , R.

Location in mine Return from 21 & 22 N. off 3 E. after Explosion

Method of sampling Vac. Date sampled 11/9/30 Hour

Velocity Area Quantity

Barometer: Inside Outside

Corrected to sea level: Inside Outside

Bulbs: Wet Dry Humidity %

Collector Marshall, K.L., Miller Mailed Received 11/13/30

Laboratory No.	53166 282	Ethane (C_2H_6)	
Carbon dioxide (CO_2)	.16	Hydrogen sulphide (H_2S)	
Oxygen (O_2)	20.49	Unsaturated hydrocarbons (C_2H_4, etc.).	
Hydrogen (H_2)			
Carbon monoxide (CO)	.01	Sulphur dioxide (SO_2)	
Methane (CH_4)	.22		
Nitrogen (N_2)	79.12		
Total	100.00		

This report is CONFIDENTIAL NOT FOR PUBLICATION OR CIRCULATION without special permit from the Director of the Bureau of Mines. Not to be used in the exploitation of any process or product.

Remarks:

Date 11/20/30 (Signed) H. P. Yant, Chemist.

Form 213 11—8890

GOVERNMENT PRINTING OFFICE

DEPARTMENT OF COMMERCE
BUREAU OF MINES

GAS ANALYSIS REPORT

Bottle No. 597 Laboratory No. 55167

Sample of Mine Air

Mine No. 6 Operator Sunday Creek Coal Co.

State Ohio County Athens Township

Town (distance and direction from, and railroad) Millfield

Name of coal bed Hocking, No. 6 Sec. , T. , R.

Location in mine On 20 West off 4 North just inside 20 west

Method of sampling Tec. Date sampled 11/11/30 Hour 12:50 P.M.

Velocity 40 Area 77 Quantity 3080

Barometer: Inside Outside

Corrected to sea level: Inside Outside

Bulbs: Wet 57.5 Dry 58.5 Humidity 94 %

Collector M. J. Aubrey, Asst. Mine Safety Engr. Mailed Received 11/13/30

Laboratory No.	55167 597		Ethane (C_2H_6)		
Carbon dioxide (CO_2)	.10		Hydrogen sulphide (H_2S)		
Oxygen (O_2)	20.30		Unsaturated hydrocarbons (C_2H_4, etc.).		
Hydrogen (H_2)					
Carbon monoxide (CO)			Sulphur dioxide (SO_2)		
Methane (CH_4)	.20				
Nitrogen (N_2)	79.40				
Total	100.00				

This report is CONFIDENTIAL NOT FOR PUBLICATION OR CIRCULATION without special permission from the Director of the Bureau of Mines. Not to be used in the application of any process or product.

Remarks:

Date 11/28/30 (Signed) W. P. Yant, Chemist.

Form 213 11—8890 GOVERNMENT PRINTING OFFICE

DEPARTMENT OF COMMERCE
BUREAU OF MINES

GAS ANALYSIS REPORT

Bottle No. 598 Laboratory No. 53168

Sample of Mine Air

Mine #6 Operator Sunday Creek Coal Co.

State Ohio County Athens Township

Town (distance and direction from, and railroad) Millfield

Name of coal bed Hocking #6 Sec. , T. , R.

Location in mine Face of 6 North

Method of sampling Vac. Date sampled 11/11/30 Hour 12:25 P.M.

Velocity Area Quantity

Barometer: Inside 30.4 Outside 30.75

Corrected to sea level: Inside Outside

Bulbs: Wet 58 Dry 67.5 Humidity 97 %

Collector M. J. Ankeny, Asst. Mine Safety Engr. Mailed Received 11/12/30

Laboratory No.	53168 598		Ethane (C_2H_6)		
Carbon dioxide (CO_2)	.19		Hydrogen sulphide (H_2S)		
Oxygen (O_2)	20.26		Unsaturated hydrocarbons (C_2H_4, etc.).		
Hydrogen (H_2)					
Carbon monoxide (CO)			Sulphur dioxide (SO_2)		
Methane (CH_4)	.44				
Nitrogen (N_2)	79.11				
Total	100.00				

Remarks:

Date 11/26/30 (Signed) W. P. Yant, Chemist.

GOVERNMENT PRINTING OFFICE

DEPARTMENT OF COMMERCE
BUREAU OF MINES

GAS ANALYSIS REPORT

Bottle No. 600 | Laboratory No. 53169

Sample of Mine Air

Mine #6 | Operator Sunday Creek Coal Co.

State Ohio | County Athens | Township

Town (distance and direction from, and railroad) Millfield

Name of coal bed Hocking #6 | Sec. , T. , R.

Location in mine On 3 North just inby 20 West

Method of sampling Vac. | Date sampled 11/11/30 | Hour 9:35 A.M.

Velocity 190 | Area 64.8 | Quantity 12,312

Barometer: Inside 30.4 | Outside 30.25

Corrected to sea level: Inside | Outside

Bulbs: Wet 58 | Dry 58 | Humidity 100 %

Collector | Mailed | Received 11/15/30

Laboratory No.	53169 600	
Carbon dioxide (CO_2)	.17	
Oxygen (O_2)	20.37	
Hydrogen (H_2)		
Carbon monoxide (CO)		
Methane (CH_4)	.20	
Nitrogen (N_2)	79.26	
Total	100.00	

Ethane (C_2H_6)		
Hydrogen sulphide (H_2S)		
Unsaturated hydrocarbons (C_2H_4, etc.).		
Sulphur dioxide (SO_2)		

This report is CONFIDENTIAL NOT FOR PUBLICATION OR CIRCULATION without special permit from the Director of the Bureau of Mines. Not to be used in the exploitation of any process or product.

Remarks:

Date 11/20/30 | (Signed) W. P. Yant, *Chemist.*

Form 213 11—8806 GOVERNMENT PRINTING OFFICE

DEPARTMENT OF COMMERCE
BUREAU OF MINES

GAS ANALYSIS REPORT

Bottle No. 829 Laboratory No. 53170

Sample of Mine Air

Mine #6 Operator Sunday Creek Coal Co.

State Ohio County Athens Township

Town (distance and direction from, and railroad) Millfield

Name of coal bed Hocking #6 Sec. , T. , R.

Location in mine West of 22 East off 4 North

Method of sampling Vac. Date sampled 11/12/20 Hour 9:55 A.M.

Velocity Area Quantity

Barometer: Inside 30.4 Outside 30.75

Corrected to sea level: Inside Outside

Bulbs: Wet 58 Dry 59 Humidity 94 %

Collector M. J. Ashley, Asst. Mine Safety Engr. Mailed Received 11/13/20

Laboratory No.	53170 829	Ethane (C_2H_6)	
Carbon dioxide (CO_2)	.82	Hydrogen sulphide (H_2S)	
Oxygen (O_2)	20.31	Unsaturated hydrocarbons (C_2H_4, etc.).	
Hydrogen (H_2)			
Carbon monoxide (CO)		Sulphur dioxide (SO_2)	
Methane (CH_4)	.39		
Nitrogen (N_2)	78.68		
Total	100.00		

This report is CONFIDENTIAL NOT FOR PUBLICATION OR CIRCULATION without special permit from the Director of the Bureau of Mines. Not to be used in the exploitation of any process or product.

Remarks:

Date 11/26/20 (Signed) E. P. Yant, Chemist.

Form 213 11—8800

GOVERNMENT PRINTING OFFICE

DEPARTMENT OF COMMERCE
BUREAU OF MINES

GAS ANALYSIS REPORT

Bottle No. 655 Laboratory No. 52171

Sample of Mine Air

Mine #6 Operator Sunday Creek Coal Co.

State Ohio County Athens Township

Town (distance and direction from, and railroad) Millfield

Name of coal bed Meeking #6 Sec. , T. , R.

Location in mine Full Return 30 ft. outby overcast

Method of sampling Vacuum Date sampled 11/11/30 Hour 7:30 A.M.

Velocity 780 Area 60 Quantity 4,800

Barometer: Inside 30.4 Outside 30.75

Corrected to sea level: Inside Outside

Bulbs: Wet 56 Dry 57 Humidity 94 %

Collector W. J. Jahney, Asst. Mine Safety Engr. Mailed Received 11/13/30

Laboratory No.	52171 655		Ethane (C_2H_6)		
Carbon dioxide (CO_2)	.16		Hydrogen sulphide (H_2S)		
Oxygen (O_2)	20.54		Unsaturated hydrocarbons (C_2H_4, etc.).		
Hydrogen (H_2)					
Carbon monoxide (CO)			Sulphur dioxide (SO_2)		
Methane (CH_4)	.14				
Nitrogen (N_2)	79.16				
Total	100.00				

Remarks:

Date 11/28/30 (Signed) W. P. Yant, Chemist.

GOVERNMENT PRINTING OFFICE

DEPARTMENT OF COMMERCE
BUREAU OF MINES

GAS ANALYSIS REPORT

Bottle No. 656 Laboratory No. 55172

Sample of Mine Air

Mine #6 Operator Sunday Creek Coal Co.

State Ohio County Athens Township

Town (distance and direction from, and railroad) Millfield

Name of coal bed Meigs #6 Sec. , T. , R.

Location in mine Full return 30 ft. entry overcast.

Method of sampling Aspir. Date sampled 11/11/30 Hour 7:30 A.M.

Velocity Vac. Area 60 Quantity 4500

Barometer: Inside 30.4 Outside 30.75

Corrected to sea level: Inside Outside

Bulbs: Wet 56 Dry 57 Humidity 94 %

Collector M. P. Yant, Asst. Mine Safety Engr. Mailed Received 11/12/30

Laboratory No.	55172 656		Ethane (C_2H_6)		
Carbon dioxide (CO_2)	.16		Hydrogen sulphide (H_2S)		
Oxygen (O_2)	20.55		Unsaturated hydrocarbons (C_2H_4, etc.).		
Hydrogen (H_2)					
Carbon monoxide (CO)			Sulphur dioxide (SO_2)		
Methane (CH_4)	.15				
Nitrogen (N_2)	79.14				
Total	100.00				

This report is CONFIDENTIAL NOT FOR PUBLICATION OR CIRCULATION without special permit from the Director of the Bureau of Mines. Not to be used in the exploitation of any process or product.

Remarks:

Date 11/28/30 (Signed) M. P. Yant, Chemist.

Form 213 11—8890 GOVERNMENT PRINTING OFFICE

DEPARTMENT OF COMMERCE
BUREAU OF MINES

GAS ANALYSIS REPORT

Bottle No. 209 Laboratory No. 55181

Sample of Outside Air

Mine #6 Operator Sunday Creek Coal Co.

State Ohio County Athens Township

Town (distance and direction from, and railroad) Millfield

Name of coal bed Sec. , T. , R.

Location in mine Fifty feet from burning Slate dump on surface.

Method of sampling Vac. Date sampled 11/14/30 Hour 8:30

Velocity Area Quantity

Barometer: Inside Outside

Corrected to sea level: Inside Outside

Bulbs: Wet Dry Humidity %

Collector Asbury, Asst. Mine Safety Engr. Mailed Received 11/15/30

Laboratory No.	55181 209		Ethane (C_2H_6)		
Carbon dioxide (CO_2)			Hydrogen sulphide (H_2S)		
Oxygen (O_2)			Unsaturated hydrocarbons (C_2H_4, etc.).		
Hydrogen (H_2)					
Carbon monoxide (CO)	.00		Sulphur dioxide (SO_2)		
Methane (CH_4)					
Nitrogen (N_2)					
Total					

Remarks:

Date 11/28/30 (Signed) W. P. Yant, Chemist.

Form 213 11—8890 GOVERNMENT PRINTING OFFICE

DEPARTMENT OF COMMERCE
BUREAU OF MINES

GAS ANALYSIS REPORT

Bottle No. 361 Laboratory No. 85188

Sample of Mine Air

Mine #6 Operator Sunday Creek Coal Co.

State Ohio County Athens Township

Town (distance and direction from, and railroad) Millfield

Name of coal bed Rocking No. 6 Sec. , T. , R.

Location in mine Face of N Rast off 3 North

Method of sampling Tan. Date sampled 11/13/30 Hour 12:05

Velocity Area Quantity

Barometer: Inside Outside

Corrected to sea level: Inside Outside

Bulbs: Wet Dry Humidity %

Collector M. J. Ankney, Asst. Mine Safety Engr. Mailed Received 11/15/30

Laboratory No.	85188 361	Ethane (C_2H_6)	
Carbon dioxide (CO_2)	.20	Hydrogen sulphide (H_2S)	
Oxygen (O_2)	20.48	Unsaturated hydrocarbons (C_2H_4, etc.).	
Hydrogen (H_2)			
Carbon monoxide (CO)	.00	Sulphur dioxide (SO_2)	
Methane (CH_4)	.30		
Nitrogen (N_2)	79.02		
Total	100.00		

Remarks:

Date 11/28/30 (Signed) W. P. Yant, Chemist.

Form 213 11—8890 GOVERNMENT PRINTING OFFICE