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SECTION WORK, EXAMINING AND REPORTING ON
COAL PROPERTIES A SPECIALTY.

TWENTY-FIVE YEARS EXPERIENCE IN COLORADO.
TEN YEARS AS STATE INSPECTOR OF COAL MINES.
CLASS 1884.

R E P O R T

On

R E L I A N C E, M I N E S,

Of

THE UNION PACIFIC COAL COMPANY,

At

RELIANCE, WYOMING.

By

JOHN McNEIL, M. E.,
Consulting Engineer,
Equitable Building,
Denver, Colorado,
MARCH, 1911.

To: D. O. CLARK, ESQ.,
Vice-President & General Manager,
The Union Pacific Coal Company,
Omaha, Nebraska.

Dear Sir:

P r e f a t o r y:

Acting upon instructions received from you, I made an examination of the work done at Reliance, and I herewith present this brief report on what I saw there.

The operations being followed, at this time, are in a progressive state of development, but with sufficient

known disclosures in the coal measures to place the venture safely beyond experiment (as the prospect work now performed has proven beyond any reasonable doubt that the coal bearing rocks are underlaid with various seams of coal of such thickness and of such quality as to make the future success of the Reliance collieries now apparent).

The Location Of Reliance, is about six miles in a northerly direction from Rock Springs, in Township 20 North, Range 104 West. No. 1 Mine is opened in Section 31.

The Coal Formation, extends from Rock Springs, and the outcrop of the seams may be traced from there on to Reliance. The lithological character of the rocks and characteristics of the coal seams remain very much the same throughout this portion of the field.

The Rock Springs Coal Field, contains six workable coal seams within about 1,700 feet of strata, and for convenience in giving here a synopsis of the same, I shall designate the top seam (nearest the surface) as "A", the second "B", and so on, descending through the measures.

Coal Seam "A", 10 feet in thickness, was opened in 1882 by No. 6 Slope, 48 acres were worked out; dip 17 degrees, abandoned in 1886, account of inferior coal.

Noted

Coal Seam "B", 6 feet in thickness, opened in 1879 by "old No. 5 Slope"; dip, 11 degrees; 31 acres worked out; abandoned 1885 account of inferior coal.

Coal Seam "C", (216' under "B"), 7' 6" in thickness, opened in 1873 by No. 3 Mine; dip 9 degrees, 491 acres worked out; abandoned 1895 account of poor roof, inferior coal and expensive mining.

Coal Seam "D", (239' under "C"), 9' 6" in thickness, opened in 1869, abandoned a little over a year ago, account of long haulage, heavy pumping, expensive mining; dip from 6 to 20 degrees.

Coal Seam "E", (260' under "D"), 5 to 7' in thickness, is now in operation by Nos. 7, 8, 9 and 10 Mines, dip 4 to 5 degrees.

Coal Seam "F", (450' under "E") 3' 6" in thickness, has never been worked by Un. Pac. Coal Co., but has been operated by others.

No. 1 Mine, is opened on the horizon of "D" Seam, the fourth from the surface (better known as No. 1 Seam), by a slope opening. See map attached at end of this report.

The Thickness Of The Coal, is 12' 6" and runs thus very uniformly throughout the mine.

The coal is practically free from impurities, and presents a good appearance.

The Dip, trends westerly, at an inclination from the horizontal of 15 degrees.

The roof, the floor and character of the coal show about the same physical properties as that of No. 1 Mine (the same coal horizon) at Rock Springs.

The Quality Of The Coal, no doubt will, with depth, be about the same as at Rock Springs, but at the present time, the percentage of moisture is higher.

Analyses:

	No. 1 Mine, (No. 1 Seam)	No. 4 Prospect, (No. 5 Seam)
Moisture,-----	7.31%	6.96%
Volatile Matter,-----	41.26	38.25
Fixed Carbon,-----	47.03	50.11
Ash,-----	<u>4.40</u>	<u>4.68</u>
	100.00%	100.00%
	12' 8" Clean coal,	5' Clean Coal.

No. 5 Seam, referred to with the above analyses, is "C", the third seam from the surface.

It might be well to adopt alphabetical letters or numbers to designate the horizon of the different coal beds.

It will be seen by referring to the analysis of "No. 5 Seam", that the coal shows up well.

The Coal Is Being Undermined, and shooting from the solid is strictly prohibited.

In The Plan Of Working, it will be noticed on the map that the pillars left are of good proportions to withstand the pressure that may be brought upon them by the overlying strata, providing proper proportions of the coal seam is also left, in pillars in the working of the rooms. I would recommend that only 40% of the coal seam be mined in advancing the workings. But, better still, I would strongly advise that entries, wherever possible, be driven to the boundary and work back by the retreating system from there. See plan herewith attached at the end of this report.

I did not make any examination along lines geologically, in the correlation of the seams, but I understand that the coal bed horizons from "B" to "F" are embraced within the measures in portions of the district, and no doubt a vast tonnage of available coal will be found at Reliance and its vicinity.

A Spacious Shaft, of double hoisting compartments, with pumping, air and ladder ways, is now in process of sinking, and had reached, at the time of my visit, a depth of 170 feet.

Considerable difficulty was being experienced with the pumps getting badly cut and worn by the passing of fine sand with the water, through their working parts. This trouble became so marked that it seriously retarded the progress of sinking.

Mr. Manley, his General Foreman, Mr. Pryde, and I, after an examination of existing conditions, talked with the party in charge of sinking operations, and we decided there was too much water reaching the bottom of the shaft (approximating some 200 gallons per minute), so Mr. Manley gave orders to excavate a lodgment in the side of the shaft to hold about 15,000 gallons of water, and to cut a "ring" around the sides of the shaft, in proximity to the lodgment, to drain all water possible into such reservoir and place a pump to throw the water from there to the surface.

These orders carried out, there will be but little water to pump from the shaft bottom, and consequently but very little sand.

A rotary pump for the bottom of the shaft was also talked of, which might discharge into the lodgment, draining the water through a mesh screen.

On my second visit to the shaft, this work was nearing completion, and I have no doubt but when sinking was resumed, the work would progress more favorably.

The stratum of sand being passed through at that time, while hard in the solid, dissolved quickly into very fine

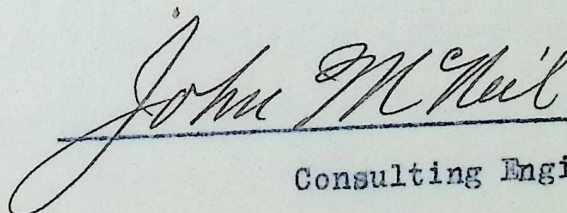
division with the water, when broken, and had a badly scouring effect on the working parts of the pumps.

Of The Geological Horizon Of The Shaft Mouth,

(in the measures), I have no definite knowledge. No doubt the drilling records in the field shall have indicated this approximately to you; and as I am informed, the shaft shall pass through the horizons of at least "C", "D" and "E" coal beds (Nos. 5, 1 and 7 Seams) within a reasonable depth.

Trusting the longevity of the Reliance shaft, with large annual tonnages of coal, shall meet your most sanguine hopes, I have the pleasure to remain,

Yours obediently,

 M. E.
Consulting Engineer.

A P P E N D I X.

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Remarks: It is said, the inevitable risks in American coal mines exact in their toll of accidents, 34%, and 66% due to the negligence of employees and employer.

In 1908, 3,450 fatal and 6,772 non-fatal accidents occurred in the mines of the United States. It seems that many deaths occurred from risks taken to save labor, being in too much of a hurry, and ignorance or non-observance of company's special rules.

I would advise that general instructions be frequently given to employees regarding the proper and safe conduct of their work by those in charge at the mines. See to it that all employees understand the company's rules, and demand an uncompromising obedience to the same.

Protect workmen and property against the dangers arising from spontaneous combustion of the "gobs" and ordinary fires in and about the mines with every known precaution.

Have adequate ventilation for the comfort and health of the men at the face of the work.

Prohibit "shooting from the solid"; no shot hole to extend beyond the mining.

Do not allow two or more shots to be fired in one place at the same time, let a sufficient interval elapse between blasts.

Do not permit wooden or other inflammable tool houses, boxes, seats, etc. in the mines; have same constructed with non-combustible materials, as far as practicable.

Remove all coal dust and other debris from haulage roads from time to time, keeping tracks as clean as possible, to prevent such debris from being ground up and carried off in suspension with the air-currents.

Demand an uncompromising obedience to your order, in having inspections made of every working place before the regular workmen enter, to see whether or not gas is generated; and have fire-bosses and mine foremen see that miners who are ignorant or indifferent to their own safety, are compelled to properly timber their working places.

The Organization Of A Class For American Red Cross First Aid Instruction, at each of your collieries, could not fail in its humane object of rendering, at times, incalculable good in the skillful handling and ministering timely aid to injured workmen, in the absence of a doctor.

Such a class might well include the superintendent, pit-boss and clerks at the mine, adding a few conscientious workmen of temperate habits and humane feelings who would find

their reward for services in alleviating the sufferings of their injured fellows. The class could be instructed, from time to time, by your regularly appointed physician.

There would, of course, be a necessary expenditure of money connected with the class, the maintenance of supplies, medicine, stretchers and other paraphernalia, but there might also be created, ways and means by which the general public would gladly contribute to the aid of such a humane cause, and should a tax to your companies reach a mill per ton, it would be a legitimate, as well as a humanitarian charge to the cost of coal.

The opportunity and pleasure was mine to meet 1st Lt. M. J. Shields, Medical Reserve Corps, U. S. Army, but now among coal miners in the interest of the American Red Cross as Medical Director to members of coal mine rescue cars and life saving stations.

In my talk with Doctor Shields, I was deeply impressed with the humane nobleness and vital importance of coal mining rescue work. This generously good and able gentleman kindly presented me with a copy of the American "Red Cross Abridged Text Book on First Aid", of which he is author, jointly with Major Charles Lynch, Medical Corps, United States Army.

Faithful to the request of Dr. Shields, I have carefully read his manual of instruction, with the result that I herewith enthusiastically recommend to your personal and mature

consideration, the adoption of "First Aid" work at the mines of your several coal companies.

Dr. Shields related to me, in part, the life saving value which these classes and organizations of "First Aid" have already proved in the coal mining districts of Pennsylvania.

Allow me, for your information, to herein copy the following brief remarks from the pages of the manual of First Aid:

"To gain the first-aid certificate of the Red Cross, it is, of course, necessary for students in associations to pass the same examination required from those in classes.

"The following course of instruction is recommended:

1. Structure and mechanism of the body.
2. First-aid materials.
3. General directions for rendering first aid. Shock.
4. Injuries without the skin being pierced or broken.
5. Injuries in which the skin is pierced or broken.
6. Local injuries from heat, cold and electricity.
7. Unconsciousness and poisoning.
8. Handling and carrying of the injured.
9. Special injuries of mine or railroad, etc.
10. Lecture by an expert on means for preventing accidents.
11. General review.
12. Sanitary matters, prevention of contagious diseases, such as tuberculosis, typhoid, scarlet fever, etc.

"The lectures should be shorn of all technical terms and half an hour is quite enough for them. Then the medical director or teacher should ask questions and superintend practical work by the class for half an hour. Practical work should be increased as much as possible just as soon as the men can do anything in this direction. After this, if possible, have the men discuss the subject among themselves, telling about recent injuries they have seen, how they have dressed them, etc.

"All the men should, if practical, have date cards for the year with numbers on the margin which are to be punched out at each meeting.....

"Contests in different classes or associations and between such organizations have been found to be one of the best ways to stimulate study of first aid as well as to arouse public interest in this important subject.

"The events in such contests should naturally be those having to do with first aid problems of special interest to the particular organizations concerned. As a sample of such contests, the following is taken from a program of an actual contest in the Pennsylvania mines.

Event No. 1--Man insensible from gas, totally helpless. One man to pick him up, carry him fifty feet to good air, lay him down and perform artificial respiration for one minute.

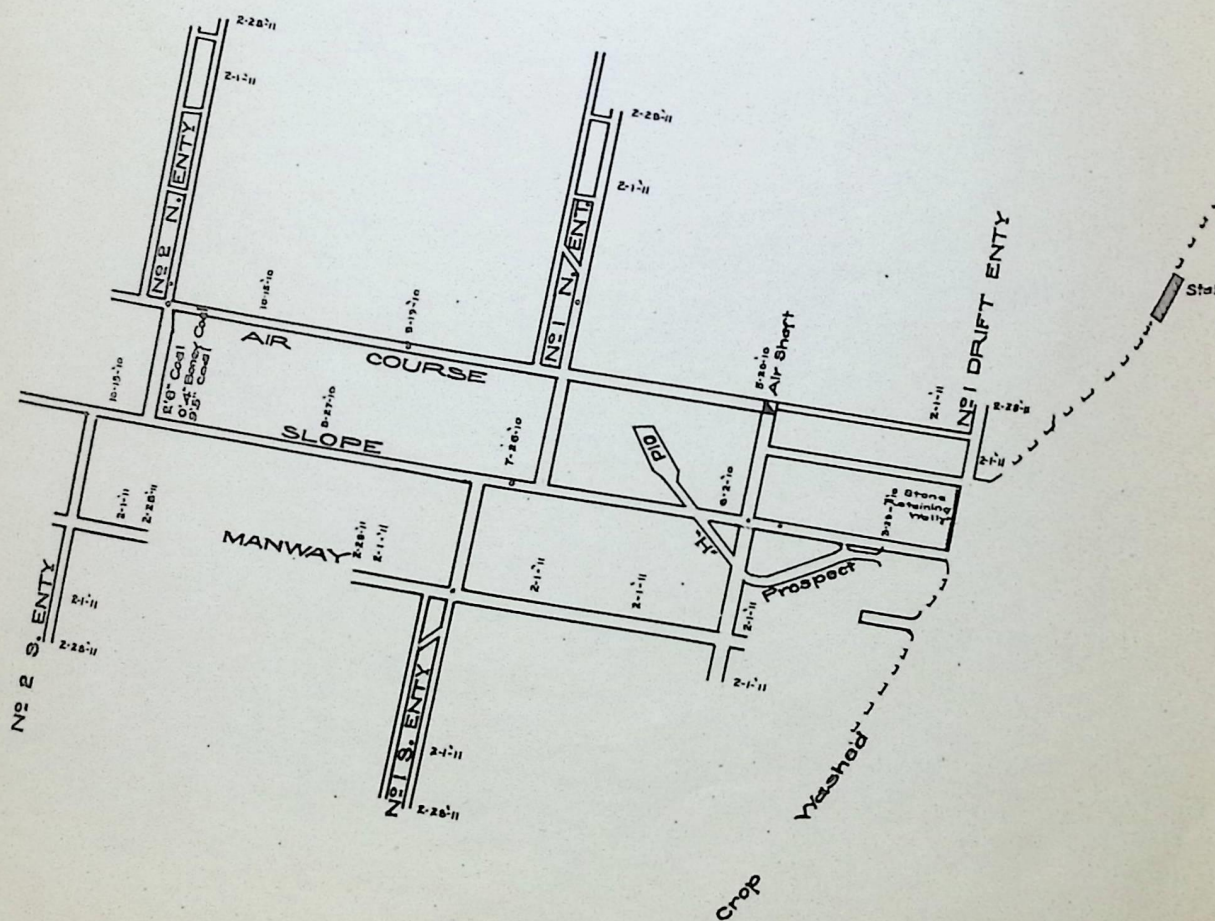
In Conclusion, it must not be construed that my enthusiasm for "First Aid" inspires me to the extent that such a class at a coal mine should necessarily have to deal with the prevention of contagious diseases or become students in anatomy, but I do think that such a class should be taught to handle and care for, in a practical manner, injured workmen in and around coal mines.

I have personally known of cases where men, becoming insensible from "after damp" gas, die for lack of medical aid, when, if the principles of "First Aid" had only been known to their fellow workmen, their lives might have been saved.

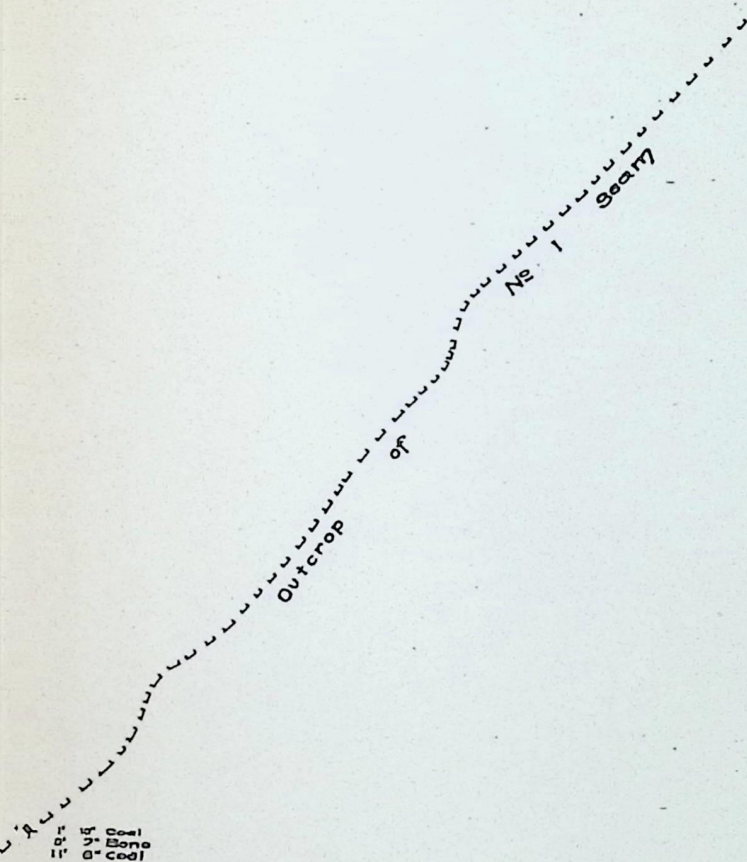
Again, I have witnessed injured men suffering much unnecessary pain, which could have been alleviated by more skillful handling.

It remains for well-regulated coal companies, such as yours, to be leaders in this humane and most worthy cause.

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THE UNION PACIFIC COAL CO.
151.31-A
MAP
OF

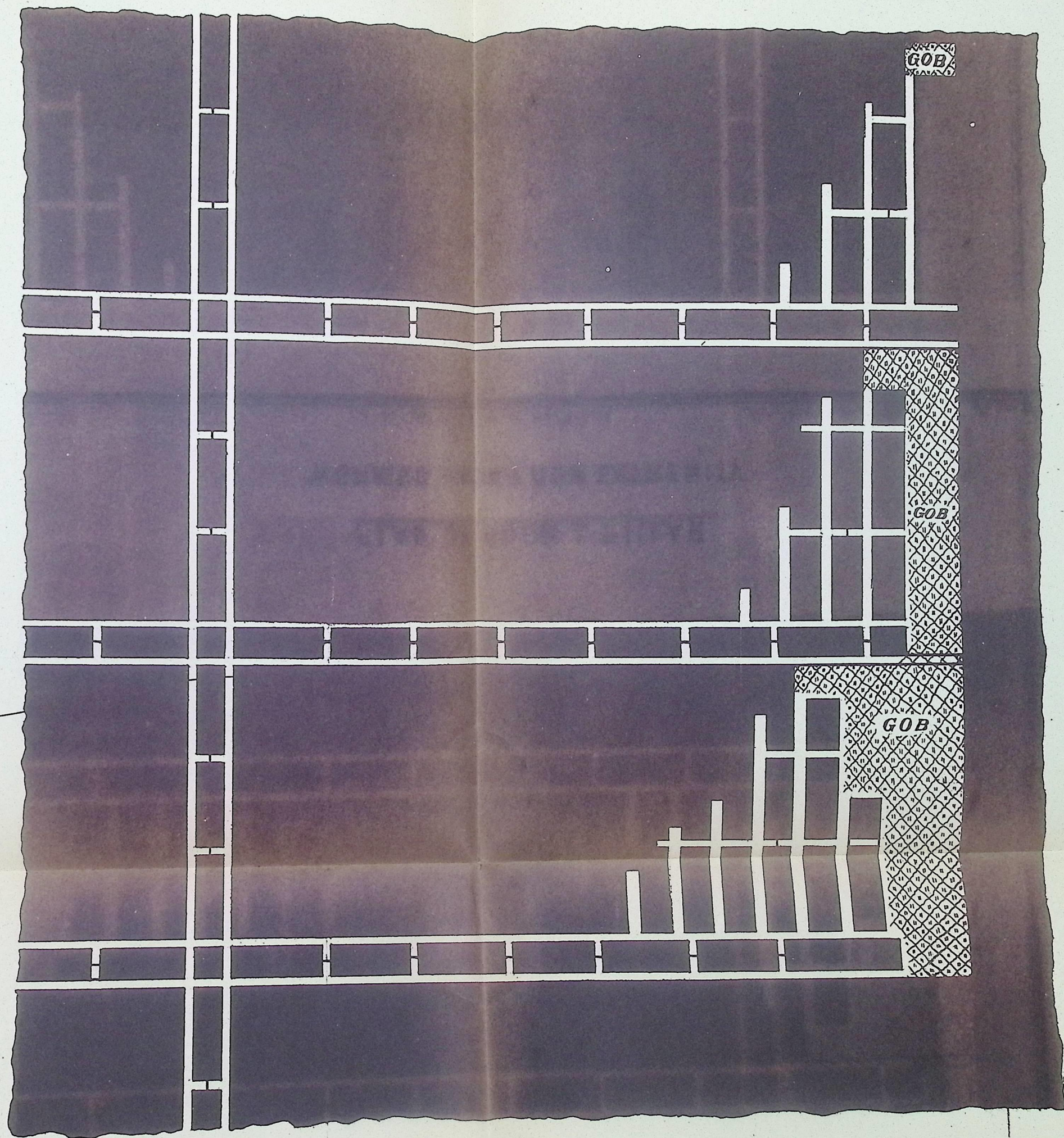
N^o 1 MINE
RELIANCE, WYO.

T. 20 N., R. 104 W.

Scale :- 1 inch = 100 ft.

TO ILLUSTRATE REPORT OF JOHN McNEIL

The Union Pacific Coal Co.,
Rock Springs, Wyo.,



PLAN OF ROOM & PILLAR
WORKING BACK FROM EXTREMITY

Scale: 100 Ft. = 1 In.

To Illustrate Report of John McNeill M.E.