PROVINCE OF BRITISH COLUMBIA

REPORT OF EXPLOSION

WHICH OCCURRED
ON FEBRUARY 8TH, 1923, IN

No. 1 SLOPE, No. 4 MINE, COMOX COLLIERY
CUMBERLAND, B.C.

OPERATED BY THE CANADIAN COLLIERIES
(DUNSMUIR) LIMITED

By
GEORGE WILKINSON, *Mining Engineer*

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Report of Explosion which occurred on February 8th, 1923, in No. 1 Slope, No. 4 Mine, Comox Colliery, Cumberland, operated by the Canadian Collieries (Dunsmuir), Limited.

By GEORGE WILKINSON, - *Mining Engineer.*

VICTORIA, B.C., April 20th, 1923.

Hon. William Sloan,
Minister of Mines, Victoria, B.C.

SIR,—Pursuant to instructions received from you by telephone at 10.30 p.m. on the night of February 8th, 1923 (and confirmed later by letter), to make a special investigation and report on an accident which occurred that evening in the No. 4 mine, Comox Colliery, Cumberland, B.C., operated by the Canadian Collieries (Dunsmuir), Limited, and resulted in the loss of life. I left Victoria at once by motor for Cumberland, and arrived there early in the morning of February 9th.

LOCATION OF COLLIERY.

The mines of the Comox Colliery are situated in the Comox District, in the vicinity of the City of Cumberland, 70 miles north of the City of Nanaimo. A railway about 20 miles in length connects the various mines to a shipping-point at Union Bay. The colliery consists of the following mines: Nos. 4, 5, 6, and 8; No. 4 mine being the only one in active operation at the present time.

No. 4 mine is very extensive, having been in operation for about twenty-five years, and consists of two haulage slopes, which converge at a point about 50 feet distant from the portal of the mine; the output from the two slopes being handled in the one tipple and screening plant.

It was in the No. 2 slope of this mine where an explosion occurred on August 30th, 1922, resulting in the loss of eighteen lives.

LOCATION OF EXPLOSION IN THE MINE.

The location of this explosion is in No. 1 slope, in what is known as No. 2 East section off No. 4 slope, No. 15 West level.

HISTORY OF RECOVERY-WORK.

Over twelve hours having elapsed since the explosion occurred before the writer arrived on the scene, the following description of the recovery-work that had been done during that time is taken from the evidence of the witnesses at the Coroner's inquest, and especially that of the district superintendent of the Canadian Collieries, Charles Graham.

After being notified of the occurrence of the explosion, Mr. Graham immediately proceeded to the mine and organized crews and proceeded with the rescue-work. After landing on No. 15 West level, at the top of No. 4 slope, he was joined by Mr. Walker, the mine manager, and others. They then proceeded down No. 4 slope, and at No. 2 West level found an overcast damaged and a lot of paper scattered on the slope. They had seen eight men, and these men had informed them that the explosion was down the Main slope; some of these men were from Nos. 3 and 4 West sections. The party proceeded down the slope and came to a cave just about the entrance to No. 4 West level, and here found the bodies of Martinello and Mitchell lying against the high rib just at the intake of No. 4 West level. Mr. Graham was then advised that there was a body at the entrance to No. 2 East level, which is nearly opposite No. 4 West. He

went and took a look and saw it was the body of a Chinaman. As this point seemed rather badly caved, the party did not proceed farther in No. 2 East level at that time, but went back into No. 4 West level and did some exploring-work there. They found the bodies of four Chinese just inside of the siding and the bodies of two more Chinese a little farther in. Mitchell's body by this time had been removed and instructions were given to have the bodies of the Chinese removed. Martinello's body was caught by a timber, which had to be removed before his body could be taken out. The party then went farther down and looked in the entrance of No. 2 East level and down the slope. Going down the slope farther, they found the bodies of seven white men and four Chinese lying on the siding on the slope. A little farther on the body of Frelloni, a hoist-boy, was found lying at the hoist. The party could not get any farther in that direction at that time as there was a considerable quantity of gas there. They went back up the slope and had these bodies removed, with the exception of Frelloni. Frelloni was removed later when conditions were fit, so that men could get in there. Just about this time Mr. Graham was informed that there was a man down the Main slope overcome, and a party he had sent over there to investigate the possibility of a fire existing in that part of the mine had found this man, and they had some difficulty in getting out, and they did not know if any other men were there or not. The men were then withdrawn from exploratory work in No. 4 slope, and the doors on the Main slope were opened, allowing the air to go down the slope. The party then went down the Main slope and recovered the man who had been overcome, and who turned out to be one of the rescue party named Walker who had got astray; he was alive but unconscious, but he recovered consciousness later in the hospital. The party then made an examination of this slope to ascertain if there were any other men, but could not find any, so returned to No. 4 Slope section, and found a considerable quantity of gas still lying there. They then decided to endeavour to locate the other bodies. They proceeded as far as the hoist on the slope and noticed conditions did not seem to get very much better or very much worse, so they decided to go to the top of the Diagonal slope. Mr. Charles Graham, Mr. Walker, and Mr. Williams went down the Diagonal slope, thinking there would be some men down there, but could not find any trace of men in that section, so they went back to No. 4 slope, and were advised by Thomas Graham that he and party had discovered some men alive. The party then went down the slope and found five white men and four Chinese lying at the second place off to the left of the slope. Artificial respiration was then tried on the men that were there; three white men and the Chinese responded to treatment, but the other two white men did not—one of them had apparently been dead for some time. After these men were got out the party then started to explore No. 2 East section, and found the bodies of Whitehouse and Huby. About this time the writer and Acting Chief Inspector of Mines Dickson arrived on the scene, and we were informed by Thomas R. Jackson, District Inspector of Mines, as to the progress of the recovery-work. Mr. Dickson and myself immediately proceeded into the mine to investigate the possible cause of the explosion and to assist in the recovery-work. All the men had been accounted for by this time except eight in No. 2 East section. The ventilation was deflected into this section and exploratory work begun and carried on, and well in the afternoon of the 9th the bodies of six out of the eight had been recovered and all the working-face had been traversed. The two men not found were in the level, and there being a cave in this place it was thought the bodies would be found under this cave. The relief party on the afternoon going in were put to cleaning up this cave, and the body of one Chinaman was found, but no trace of the other man was found.

Next morning, the 10th, the writer, accompanied by Mr. Dickson, Acting Chief Inspector of Mines; Mr. Jackson, District Inspector of Mines; Charles Graham, District Superintendent; George O'Brien, Safety Engineer, of the Canadian Collieries (Dunsmuir), Limited, and other officials made a further search of No. 2 East district for the missing Chinaman, and every inch of ground was thoroughly searched, except that covered by caves on the level and the airway on the rise side of the level, between the cogs and barrier pillar; this airway being full of explosive gas.

From evidence shown by the lines of force of the explosion around this point, the writer was of the opinion the missing Chinaman would be found in this airway. On Sunday, the 11th, a party was sent in equipped with mine-rescue apparatus and they reported a man in there about 70 feet back from the face. The body was then brought out and this accounted for all the bodies in the mine.

CONDITION OF THIS PART OF THE MINE PRIOR TO THE EXPLOSION.

To show this the following reports are appended:—

(1.) Firebosses' reports three weeks prior to the explosion.
(2.) Gas Committee's reports for November and December, 1922, and January, 1923.
(3.) Efficiency Committee's report for January, 1923.
(4.) Overman's report, February 5th, 6th, 7th, and 8th, 1923.
(5.) Inspector of Mines' report for January, 1923.
(6.) Analysis of mine-air samples.
(7.) Burrell gas-detector tests.

FIREBOSSES' DAILY REPORTS, No. 4 MINE.

(FROM JANUARY 20TH TO FEBRUARY 8TH, 1923.)

Date: January 20th. Time: 6.45 a.m. District: 3 and 4 West levels, 2 East and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: Small quantity of explosive gas in No. 4 place, 3 West dip-slant. All other working-places and roadways are clear and in good condition.

ROBERT BARKER; W. W.

Date: January 20th. Time: 3 p.m. District: 2 East and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: All working-places and roadways are clear of gas and in order.

W. WHITEHOUSE.

Date: January 20th. Time: 9.45 p.m. District: 1 and 20 West, 2 East, and 4 slope.
Barometer: 29.7 inches. Thermometer: 30° F.
Roof and sides: Good. Ventilation: Good.
Remarks: All working-places and roadways are clear of gas and in good condition.

A. G. JONES; R. B.; S. H.

Date: January 21st. Time: 2.30 p.m. District: 1 and 4 slopes.
Barometer: 29.44 inches. Thermometer: 32° F.
Roof and sides: Good. Ventilation: Good.
Remarks: Found small quantity of explosive gas in No. 4 place to dip 3 West. Rest of places clear and in safe working condition.

T. CUNLIFFE.

Date: January 21st. Time: 10.30 p.m. District: 1 and 4 slopes.
Roof and sides: Good, except small cave in 2 East level. Ventilation: Good.
Remarks: Found explosive gas in No. 3 place off dip 3 West. All other places free from gas and in good condition.

N. BEVIS; W. WHITEHOUSE.

Date: January 22nd. Time: 6.30 a.m. District: 3 and 4 West and 2 East slope.
Roof and sides: Good. Ventilation: Good.
Remarks: Examined all working-places and roadways; found them safe and clear from gas.

W. KEENAN.

Date: January 22nd. Time: 2.30 p.m. District: 2 East and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: All working-places clear of gas and in good condition.

R. WALKER.

Date: January 22nd. Time: 11 p.m. District: 2 East and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: All working-places and roadways clear of gas and in good order.

W. WHITEHOUSE.

Date: January 23rd. Time: 6.30 a.m. District: 3 and 4 West and slope and 2 East.
Barometer: 29.28 inches. Thermometer: 28° F.
Roof and sides: Good. Ventilation: Good.
Remarks: All working-places and roadways in safe condition, except small amount of gas in top level, 8 slant, 3 West; all others safe and free from gas.

W. KEENAN.

PROVINCIAL LIBRARY,
VICTORIA, B. C.

Date: January 23rd. Time: 3 p.m. District: 2 East and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: All working-places and roadways clear of gas and in working-order.

R. WALKER.

Date: January 23rd. Time: 11 p.m. District: 2 East and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: All working-places and roadways are free from gas and in good order.

W. WHITEHOUSE.

Date: January 24th. Time: 6.45 a.m. District: 3 and 4 West and slope and 2 East.
Roof and sides: Good. Ventilation: Good.
Remarks: Examined all places and roadways; small amount of gas in Nos. 3 and 5 places, 3 West, also 2 East level; all others in safe condition and clear of gas.

W. KEENAN.

Date: January 24th. Time: 3 p.m. District: 1 and 4 slopes.
Barometer: 29.48 inches. Thermometer: 36° F.
Roof and sides: Good. Ventilation: Good.
Remarks: Small quantity of explosive gas in slant-face off lower level 3 West; others clear of gas and in working-order.

J. DANDO.

Date: January 24th. Time: 10.30 p.m. District: 1 and 4 slopes.
Roof and sides: Good. Ventilation: Good.
Remarks: There is a small quantity of explosive gas in first slant off lower level, 3 West; all other places in good condition and free from gas.

A. W. WATSON; W. WHITEHOUSE.

Date: January 25th. Time: 6.45 a.m. District: 3 and 4 West levels, 2 East and 4 slope.
Barometer: 29.34 inches. Thermometer: 28° F.
Roof and sides: Good. Ventilation: Good.
Remarks: Found small quantity of explosive gas in slant off No. 5 level dip-slant, 3 West; all other working-places and roadways are clear and in safe condition.

R. BARKER.

Date: January 25th. Time: 2.30 p.m. District: 2 East and 4 slope.
Barometer: 29.3 inches. Thermometer: 38° F.
Roof and sides: Good. Ventilation: Good.
Remarks: Small quantity of explosive gas in raise side of 2 East level; all other places clear and in good condition.

R. WALKER.

Date: January 25th. Time: 11 p.m. District: 2 East and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: All working-places and roadways are clear of gas and in good order.

W. WHITEHOUSE.

Date: January 26th. Time: 3 p.m. District: 2 East and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: Small quantity of explosive gas in raise side of 2 East level; all other places clear and in good condition.

R. WALKER.

Date: January 26th. Time: 11 p.m. District: 2 East and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: Found a little explosive gas high side of 2 East level; the rest are clear and in order.

W. WHITEHOUSE.

Date: January 27th. Time: 6.45 a.m. District: 3 and 4 West levels, 2 East, and 4 slope.
Barometer: 28.88 inches. Thermometer: 28° F.
Roof and sides: Good. Ventilation: Good.
Remarks: Small quantity of explosive gas in slant off 5 level, 3 West dip-slant; all other places and roadways are clear and in safe condition.

ROBERT BARKER.

Date: January 28th. Time: 6 a.m. District: 3 and 4 West levels, 2 East, and 4 slope.
Barometer: 28.92 inches. Thermometer: 22° F.
Roof and sides: Good. Ventilation: Good.
Remarks: Small quantity of explosive gas in high side of 2 East level; all other working-places and roadways are clear of gas and in safe condition.

ROBERT BARKER.

Date: January 28th. Time: 2.30 p.m. District: 1 and 4 slopes.
Roof and sides: Good. Ventilation: Fair.
Remarks: Found small cap of gas throughout 20 West district; all other working-places and roadways in good condition.

J. C. Brown.

Date: January 28th. Time: 10.30 p.m. District: 1 and 4 slopes.
Barometer: 29.26 inches. Thermometer, 26° F.
Roof and sides: Good. Ventilation: Good.
Remarks: Small gas-cap throughout 20 West section; also new airway 1 West; others clear; all in working-order.

J. Dando.

Date: January 29th. Time: 6.45 a.m. District: 3 and 4 West levels, 2 East, and 4 slope.
Barometer: 29.04 inches. Thermometer: 16° F.
Roof and sides: Good. Ventilation: Good.
Remarks: Small quantity of explosive gas in first left of No. 3 slant, 4 West; all other working-places and roadways are clear and in safe condition.

R. Barker.

Date: January 29th. Time: 3 p.m. District: 2 East and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: All working-places and roadways are clear of gas and in good order.

W. Whitehouse.

Date: January 29th. Time: 11 p.m. District: 2 East and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: All working-places and roadways clear of gas and in good working-order.

R. Walker.

Date: January 30th. Time: 6.45 a.m. District: 3 and 4 West levels, 2 East, and 4 slope.
Barometer: 29.46 inches. Thermometer: 12° F.
Roof and sides: Good. Ventilation: Good.
Remarks: All working-places clear of gas and in safe condition.

R. Barker.

Date: January 30th. Time: 3 p.m. District: 2 East and 4 slope.
Barometer: 29.56 inches. Thermometer: 25° F.
Roof and sides: Good. Ventilation: Good.
Remarks: All working-places and roadways are free from gas and in good order.

W. Whitehouse.

Date: January 30th. Time: 10.30 p.m. District: 2 East and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: All working-places and roadways clear of gas and in working-order.

R. Walker.

Date: January 31st. Time: 3 p.m. District: 2 East and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: All working-places and roadways are free from gas and in good order.

W. Whitehouse.

Date: January 31st. Time: 11 p.m. District: 2 East and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: All in order and clear of gas.

R. Walker.

Date: February 1st. Time: 6.45 a.m. District: 3 and 4 West levels, 2 East, and 4 slope.
Barometer: 29.64 inches. Thermometer: 26° F.
Roof and sides: Good. Ventilation: Good.
Remarks: All working-places and roadways in safe condition.

R. Barker.

Date: February 1st. Time: 3 p.m. District: 2 East and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: All working-places and roadways free from gas and in order.

W. Whitehouse.

Date: February 1st. Time: 10.30 p.m. District: 2 East and 4 slope.
Barometer: 29.7 inches. Thermometer: 25° F.
Roof and sides: Fair. Ventilation: Good.
Remarks: All working-places, roadways, and levels clear of gas and in working-order.

R. Walker.

Date: February 2nd. Time: 6.45 a.m. District: 3 and 4 West levels, 2 East, and 4 slope.
Barometer: 29.82 inches. Thermometer: 28° F.
Roof and sides: Good. Ventilation: Good.
Remarks: Small quantity of explosive gas in first left off Diagonal slope; all other working-places clear and in safe condition.

R. BARKER.

Date: February 2nd. Time: 2.30 p.m. District: 2 and 3 East and Diagonal.
Roof and sides: Good. Ventilation: Good.
Remarks: Found all working-places clear of gas and in working-order.

ROBERT REID.

Date: February 2nd. Time: 11 p.m. District: 2 East and 4 slope.
Roof and sides: Good. Ventilation: Fair.
Remarks: All working-places clear of gas and in working-order.

R. WALKER.

Date: February 3rd. Time: 6.45 a.m. District: 3 and 4 West levels, 2 East, and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: Explosive gas found in Nos. 7 and 8 slants, 3 West, and first left off Diagonal slope; all other working-places and roadways are clear and in safe condition.

R. BARKER.

Date: February 3rd. Time: 3 p.m. District: 2 East and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: Found a little explosive gas top side of 2 East level; the rest all clear and in order.

W. WHITEHOUSE.

Date: February 3rd. Time: 9.30 p.m. District: 20 West slope, 2 East, and 4 slope.
Barometer: 30 inches. Thermometer: 32° F.
Roof and sides: Good. Ventilation: Fair.
Remarks: Found small quantity explosive gas top side 2 East level and gas-cap throughout 20 West district; all other places and roadways are clear and in good condition.

J. C. BROWN.

Date: February 4th. Time: 6 a.m. District: 3 and 4 West levels, 2 East, and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: Explosive gas found in first stall off 8 slant, 3 West, also first left off Diagonal slope and in high side 2 East level; all other places clear and in safe condition.

R. BARKER.

Date: February 4th. Time: 2.30 p.m. District: 4 slope, 2 East, and 20 West.
Barometer: 29.98 inches. Thermometer: 36° F.
Roof and sides: Fair. Ventilation: Good.
Remarks: Found small quantity of explosive gas in first left off Diagonal slope and in raise side of 2 East level, gas-cap throughout 20 West district; all other places clear and in good condition.

R. WALKER.

Date: February 4th. Time: 10.30 p.m. District: 1 and 4 slopes.
Barometer: 29.98 inches. Thermometer: 32° F.
Roof and sides: Good. Ventilation: Fairly good.
Remarks: There is a small quantity of explosive gas on the high side of first left off 3 slant, 4 West, and a gas-cap throughout 20 West district; other places in good condition and free from gas.

A. W. WATSON; THOS. CUNLIFFE.

Date: February 5th. Time: 6.30 a.m. District: 3 and 4 West levels, 2 East, and 4 slope.
Barometer: 29.98 inches. Thermometer: 32° F.
Roof and sides: Good. Ventilation: Good.
Remarks: Found explosive gas in first stall off No. 8 slant, 3 West, and first left off Diagonal slope, also high side of 2 East level; all other working-places and roadways are clear and in safe condition.

ROBERT BARKER.

Date: February 5th. Time: 2.30 p.m. District: 4 slope and 2 East.
Roof and sides: Good. Ventilation: Good.
Remarks: Small quantity of explosive gas in 1st left off Diagonal slope and in raise side of 2 East level; all other places clear and in good order.

R. WALKER.

Date: February 5th. Time: 11 p.m. District: 2 East and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: Found little explosive gas high side of 2 East level and first left off Diagonal slope; the rest are clear and in order.

W. Whitehouse.

Date: February 6th. Time: 6.45 a.m. District: 3 and 4 West levels, 2 East, and 4 slope.
Barometer: 29.9 inches. Thermometer: 32° F.
Roof and sides: Good. Ventilation: Good.
Remarks: Found explosive gas in No. 7 slant, 3 West, and 3 stall off same, also first left off Diagonal slope; all other working-places and roadways are clear of gas and in safe condition.

R. Barker.

Date: February 6th. Time: 3 p.m. District: 2 East and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: Small quantity of explosive gas in first left off Diagonal slope; all other places clear and in order.

R. Walker.

Date: February 6th. Time: 11 p.m. District: 2 East and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: Found explosive gas in first left off Diagonal slope and first left off slope and top side 2 East level; the rest clear and in order.

W. Whitehouse.

Date: February 7th. Time: 6.45 a.m. District: 3 and 4 West levels, 2 East, and 4 slope.
Barometer: 29.56 inches. Thermometer: 26° F.
Roof and sides: Good. Ventilation: Good.
Remarks: Found explosive gas in No. 7 slant, 3 West, and three stalls off same, also 3 East level and high side 2 East level; all other working-places clear and in safe condition.

Robert Barker.

Date: February 7th. Time: 2.30 p.m. District: 2 East and 4 slope.
Barometer: 29.84 inches. Thermometer: 46° F.
Roof and sides: Fair. Ventilation: Fair.
Remarks: Found explosive gas in first left off Main slope, first left off Diagonal, 3 East level, and in raise side of 2 East level; all other places clear and in order.

R. Walker.

Date: February 7th. Time: 11 p.m. District: 2 East and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: Found little explosive gas top side, 2 East level, first left off 4 slope, and face of 3 East level; the rest are clear and in order.

W. Whitehouse.

Date: February 8th. Time: 6.45 a.m. District: 3 and 4 West levels, 2 East, and 4 slope.
Roof and sides: Good. Ventilation: Good.
Remarks: Explosive gas in first left off 3 slant, 4 West, also high side of 2 East level; gas-cap in first and second left off Diagonal slope; all other places clear and in safe condition.

Robert Barker.

Date: February 8th. Time: 3 p.m. District: 2 East and 4 slope.
Roof and sides: Fair. Ventilation: Fair.
Remarks: Small quantity explosive gas in first left off Main slope, first left off Diagonal slope, and raise side of 2 East level; all other places clear and in working-order.

R. Walker.

COPIES TAKEN FROM REPORT-BOOK OF GAS COMMITTEE.

No. 4 Mine, Comox Colliery, No. 1 Slope, November 18th, 1922.

We, the undersigned, have examined No. 1 slope and found gas in first left and second left off Main slope; also small cap in stoppings between 17 and 18 on Main slope of 20 West; small cap of gas in return between 2 West and airway in 1 West; explosive gas in 3 left, 3 slant, 4 West. Roadways good and airways in fair condition.

Sid. Hunt.
H. Buchanan.

NO. 4 MINE, COMOX COLLIERY, NO. 1 SLOPE, DECEMBER 22ND, 1922.

We, the undersigned, have examined No. 1 slope and found a small gas-cap at crosscut on 20 slope; also found explosive gas in Nos. 1 and 2 left in 3 West slope; also cap of gas outside of 2 slant in 3 West; small cap of gas in 6 slant, also in 5 slant, 2 West; small cap of gas in return between 2 and 1 West levels; explosive gas in 1 West airway. Roadways good; airways fair.

H. BUCHANAN.
SID. HUNT.

NO. 4 MINE, COMOX COLLIERY, NO. 1 SLOPE, JANUARY 19TH, 1923.

We, the undersigned, have examined No. 1 slope and found explosive gas behind the brushing in No. 1 place, 7 slant, and the first place, 8 slant, 3 West. All other places clear and in good condition.

SIDNEY HUNT.
H. BUCHANAN.

COPY OF EFFICIENCY COMMITTEE'S REPORT OF JANUARY 20TH, 1923.

CANADIAN COLLIERIES (DUNSMUIR), LTD., CUMBERLAND, B.C., NO. 1 SLOPE, NO. 4 MINE.

We, the undersigned, examined the working-places in No. 1 slope; we found explosive gas in No. 4 place, dip-slant, No. 3 West level; also a small cap throughout 20 West, No. 1 slope. All other places in good order.

(Signed) ROBERT DUNSIRE.
HARRY ARMSTRONG.

REPORT OF INSPECTOR OF MINES.

I hereby give notice that I have this day examined the underground workings of that part of the Canadian Collieries (Dunsmuir), Limited, Cumberland, B.C., Colliery known as No. 1 slope, No. 4, Comox Mine, and find the following conditions to prevail therein:—

Part of mine examined: All working-parts of East and West side of No. 4 slope.

Ventilation: Good.

Explosive gas: Found none; got a slight gas-cap in No. 1 West level air-current and ¼-inch gas-cap at face of side slope off No. 4 slope.

Roadways: In good condition.

Timbering: In good order. Sections fairly free from coal-dust.

General remarks:—No. 1 Split: There was 16,000 cubic feet of air a minute passing for the use of sixty-nine men and eight mules. No. 2 Split: There was 15,500 cubic feet of air a minute passing for the use of sixty-eight men and four mules.

Dated at Cumberland, B.C., this 29th day of January, 1923.

THOMAS R. JACKSON,
Inspector of Mines.

MINE-AIR SAMPLE.

(Letterhead.)

DEPARTMENT OF MINES, CANADA.

REPORT OF ANALYSIS OF MINE-AIR SAMPLE.

Report No. 2861.

OTTAWA, January 12th, 1923.

Operator: The Canadian Collieries (Dunsmuir), Limited, Cumberland, B.C.
Mine: No. 4 Comox. Seam: Upper.
Location sampled: No. 1 slope; at fan.
Sample taken by: Thomas R. Jackson. Sample shipped by: T. R. J.
Date of sampling: December 14th, 1922. Sample received at Laboratory: January 8th, 1923.
Sample No. 8. Laboratory No: 8/23, No. 8.

Chemical Analysis.

	Per Cent.
Carbon dioxide	0.39
Oxygen	19.69
Methane	0.79
Nitrogen	79.13

Technical Analysis.

	Per Cent.
Air	94.08
Fire-damp	0.79
Black-damp	5.13

F. G. WAIT,
Chief Chemist.

BURRELL GAS TEST.

In the Main return of No. 1 slope, about 600 feet distant from the fan, the Burrell gas-detector showed 0.6 per cent. methane at the time of Inspector Jackson's visit in January.

VENTILATION.

The ventilation of No. 4 mine is maintained by two fans, each slope having separate intake and return airways, except for a small portion of the main intake from the portal at the entrance to the tipple to a point where the slopes diverge.

For the ventilation of No. 2 slope there is installed a Sullivan reversible double-inlet fan, with a rated capacity of 180,000 cubic feet a minute, against a 6-inch water-gauge. The fan is electrically driven by a 350-horse-power induction-motor, 2,200 volts, speed 250 revolutions a minute, directly connected to the fan-shaft. For the ventilation of No. 1 slope there is installed a 108-inch double-inlet reversible Sirocco fan on a concrete base with half-housing in steel. This fan is connected to the mine by a reinforced-concrete tunnel fully equipped with explosion-doors. This fan, running at 250 revolutions a minute, has a rated capacity of 200,000 cubic feet of air a minute, against a 6-inch water-gauge. The primary power unit is a 500-horse-power synchronous motor, 2,200 volts, equipped with a self-starting unit. The motor has a rated speed of 500 revolutions a minute, and is connected to the shaft of the fan through a jack-shaft with silent chain-drive in two sections, each 15 inches wide; the ratio between the motor and fan speed being 2 to 1, and between centre of drives is 106 inches. In addition to the primary drive, there is carried an emergency drive unit, consisting of a 350-horse-power induction-motor, speed 250 revolutions a minute, which can be connected by coupling direct to the main fan-shaft.

The actual quantity passing in No. 4 mine at the time of Inspector Jackson's examination in January, 1923, was 157,500 cubic feet of air a minute, and the amount in the return of No. 1 slope was 79,000 cubic feet a minute. At the head of No. 4 slope, No. 15 West level, there was passing in the intake 42,000 cubic feet a minute. This is divided into two splits: No. 1 split for the West side there was passing 16,000 cubic feet a minute, and No. 2 split on the East side there was passing 15,500 cubic feet a minute. No. 2 East section is located on No. 2 split.

CONDITIONS AS FOUND IN MINE AFTER EXPLOSION.

Proceeding down No. 4 slope, off No. 15 West level, no damage is found until the overcast below No. 2 West level is reached. This overcast is constructed of 10- by 10-inch beams laid in mortar and cement and reinforced with steel rails on the bottom, and in addition to the ends being supported by concrete walls, two bridge-sticks of square timber are erected, one on each side of the track, to support the span. These two bridge-sticks were knocked out by the force of the explosive blast travelling up the slope, and the beams of which the sides were constructed were dislodged as though they had been shaken apart by the concussion. This overcast was not in use, but had been built in preparation for changes to be made in the ventilation at a future date. There were four stoppings in the different roads in the vicinity of this overcast, and only one out of the four was damaged, which would indicate the force of the blast was well spent when it reached this point. Proceeding down the slope approximately 500 feet farther, at the No. 1 East counter-level a stopping is found destroyed. Sixty feet below this point a cave is encountered which extends on the slope for 160 feet. This cave also extends into No. 4 West level for approximately 30 feet, and into No. 2 East level, which is almost opposite No. 4 West level, for approximately 75 feet. At the inby end of the 160-foot cave on the slope there is a flat where a fault was encountered. On this flat a siding is made. On this siding was found the bodies of A. Robertson, J. Turner, D. Somerville, V. Cavallero, P. Manicora, T. Williams, R. Smith, Jung Wah, Fong Dong, Jung Bing Poy, and Jung Hah; all of them having been overcome by after-damp. They worked farther down the slope and had travelled after the explosion occurred distances varying from 800 to 1,100 feet. Five Chinese who worked alongside of the men overcome on the way out, and who stayed inside for nearly two hours after the explosion occurred, escaped, and of the five white men and four Chinese who stayed in after the other Chinese left and escaped, all were overcome, and two of the white men died and three were revived and were practically uninjured, and the four Chinese were all revived and taken out practically uninjured. One hundred and ten feet farther down the slope from the end of the big cave a smaller cave 30 feet in length is

encountered, and beyond this smaller cave a distance of 15 feet is located an electric hoist, which is used for the local haulage from the lower workings of the slope up to the siding on the flat. The runner of the hoist was killed by a blow behind the head, received from flying debris.

At the time of the explosion a trip of three cars was being lowered down the slope; this trip is found off the track 380 feet below the hoist. The rope-rider (Webber) was knocked off the trip by the force of the blast and rendered unconscious; he was found by some of the men coming out from the workings, who when they saw the smoke retreated back to the face and carried Webber with them; he was later rescued alive. Beyond the trip some 50 feet at the entrance to what is known as the Diagonal slope two curtains were knocked down and a board stopping situated 160 feet below the hoist in a crosscut was destroyed, but beyond this point to the face, a distance of 350 feet, no further damage was found. There are nineteen working-places in the lower workings of the slope, and everything is undisturbed in these places. No men were burned in this section, and the survivors describe the noise from the explosion as being similar to a broken compressed-air pipe.

No. 4 West Level.

As stated before, this level is caved to a point 30 feet from the entrance. At the entrance to this level and partly under the cave the bodies of G. Martinello, a tracklayer, and W. Mitchell, a boy employed for changing switches and tending doors, were found. They had apparently just been having lunch or had just finished. Timbers at the entrance to this level are a little charred and some a little farther up the slope are also charred. A siding is located at the entrance to No. 4 West level. This siding is not much damaged, but at the end of the siding, about 80 feet farther in, another cave approximately 30 feet long is encountered; the level is then undamaged for 35 feet; then another cave 25 feet long is encountered. Beyond this point there is no further damage, but evidence of flame, there being coal caked on the stringers and a little charring of the timbers. The signs of heat extend for approximately 1,000 feet in this level. About 240 feet from the entrance to the level the bodies of Jung Gar Kay, Jew King Kit, Wo Wee How, and Lee Goon, four Chinese, were found; they had been overcome by after-damp. At a point approximately 440 feet from the entrance to this level two more Chinese, Wong Toy Sing and Sing Long Toy, were found; they, too, had been overcome by after-damp and were dead. These men had come out from their working-places about 1,000 feet after the explosion occurred. The other men in this section all escaped by going out by No. 2 and No. 3 West levels. The fireboss of the district tried to stop these six Chinese from going this way, but they persisted in going. All the rest were led to safety by the fireboss and a workman named Pinfold. This fireboss (A. W. Watson) and J. Pinfold, after leading all the rest of the men to safety, returned down the slope and assisted in the rescue-work. They deserve to be commended for their great devotion to duty. Three mules left in this section were killed by the after-damp. The explosive blast did not reach the workings in this level. These survivors also state the noise resembled that made by a broken compressed-air pipe.

No. 2 East Level off No. 4 Slope.

This section when originally opened out was worked on the pillar-and-stall system, but after going in about 400 feet the coal got thinner and the long-wall system was adopted, four places being carried which give a length of face of approximately 170 feet. A barrier pillar varying from 50 to 70 feet of solid coal is left between this section and No. 1 East section.

As stated previously, the big cave on the slope continued into this level for a distance of 75 feet. At the entrance to this level is a siding. A short connection is driven from the centre of the siding through to the slope with a slight dip to keep the siding clear of water. This connection was also caved throughout. At the entrance to this level there was a wooden door; this door was blown out into the slope. At this point the body of Jung Dong was found; he was a driver employed in No. 2 East level; his body was badly burned and almost stripped of all the clothing. Many signs of violence are shown at the entrance to this level. All the cars had been carried forward by the blast of the explosion and piled in a jumbled heap, some of them being jammed into the cut through from the siding to the slope. A counter to the Main slope has been driven on the right of the slope from No. 2 East level for a distance down. A heavy stopping built of 10 by 10-inch beams laid in mortar and cement had been erected at the

top of this slope where it leaves No. 2 East level; this stopping was blown out and carried down the counter-slope. About 160 feet from the entrance to this level the body of William Whitehouse, the fireboss in charge of Nos. 2 and 3 East sections, was found; he had apparently just finished lunch and was ready to proceed into No. 2 East level on his second round. His battery was strapped on his body and he had apparently moved a few feet after he had heard the noise; his stick, cable, and detonator-case were found at the seat where he evidently took his lunch; his body was badly burned. Opposite the point where Whitehouse was found is No. 1 stall. At the entrance to this stall there is a small air-compressor, belt-driven from an electric motor manufactured by the General Electric Company, No. 44893, Type I, Class 4-35-750, Form K, 35 cycles, 35 horse-power, 440 volts, 42.5 amperes, speed 750 r.p.m. The body of Norman Huby, the shiftboss in charge of the afternoon shift in No. 1 slope, was found thrown across the driving-belt of the compressor; he was badly burned. A stopping built of 10- by 10-inch beams, and located in this stall at a point a few feet past the motor and forming the inside wall of the room for this installation, was blown out towards the level. In a slant crosscut driven down towards the counter to No. 2 East level, and in the intake to the same, but this intake being the return air from No. 3 East or Diagonal district, is located an electric-driven pump. The motor is manufactured by the Canadian Westinghouse Company, Serial No. 79742, constant speed 20 horse-power (induction-motor), 440 volts, 3-phase, 35-cycle, 27 amperes per terminal, 1,440 r.p.m.; controlled by a Canadian Westinghouse Auto Starter, Serial No. 317016, 20 to 25 horse-power, 440 volts, 3-phase, 3,000 alternation, starting period 20 seconds. Both of the motors on the two electrical installations are of the squirrel-cage type. These two electric installations are the nearest electric power to the faces in this section, the pump being about 550 feet distant and the compressor about 700 feet distant.

Just inside of No. 1 stall a box of matches was found on the rib; these matches were quite damp and had evidently been there for some time, some employee having taken them in and had then got rid of them by hiding them in the pack-wall. Proceeding along the level to a point 40 feet inside of where Whitehouse's body was found, and about 200 feet from the entrance to the level, there was a second wooden door and half-stopping, the half-stopping being built with 10- by 10-inch beams. This door and stopping were destroyed and blown outwards by the force of the explosive blast. Inside of this second door, about 85 feet, there was a third door and half-stopping similar to the others; this door and stopping were also destroyed and blown outwards by the explosive blast. Just inside of this second door a cave was encountered and extended 155 feet, completely blocking the roadway in places. Inside of this cave, approximately 80 feet, is found a mule and a trip of three loaded cars. There is unmistakable signs of force outwards at this point, small debris being lodged on the rear end of the last car on the trip, and the lump coal on top of the cars is moved forward. The mule has the tail-chain taut on the front car and is lying on its side; its hair is singed but not burned to the skin. From this trip of cars a distance of about 310 feet into the face there is very little damage. A loaded car was standing at the face. About 90 feet back from the face there had been a curtain hung; the canvas from this curtain had been driven inwards to the face, portions of it being driven into the cross-pieces of the cogs on the roadside and small pieces on the end of the car. The cogs on the rise side of the road, which is the right side going in, seemed to be shaken and disturbed for some distance back from the face, and looked as though they were bulging outwards into the roadway, and some force had been put on them from behind the pack. All the men in this section were found in positions where it was logical they should be found, with the exception of Jung Tow; he was 70 feet from the face of the level and in the return behind the pack. This section was undoubtedly the point of origin of the explosion.

A detailed description of the working-places in this section as found after the explosion is herewith given. All the workmen in this section were Chinese.

No. 2 East Level.

Loaded car standing at the face of the roadway. Debris on this car shows inward force. Face not much disturbed, except a small fall of cap-rock. The body of Hung Jung, a Chinese, was found under this cave. He was severely burned and apparently he had not moved far. A pick, shovel, and hammer were found lying at the face. The roadside cog on the high side is dislodged and moved in a downward direction, indicating that some force had come along on the top side of the cogs in an inward direction. The height of the place after the cap-rock

came down is from 6 feet on the low side of the roadway to 7½ feet on the high side. Back from the face 10 feet the height of the roof-line changes to 10 feet above the floor-line, and does not come down again level with the roof-line at the face until a point nearly 70 feet back from the face is reached. The change of the height in the roof-line makes a regular reservoir for gas and a difficult place to ventilate, which owing to the position of the same on the rise side of the place, and the air being coursed around behind the cogs, the portion behind the cogs being the return airway. The natural tendency of the air being coursed here would be for it to sweep under the higher portion and not dislodge the gas along the roof-line. This is proved by the fact that explosive gas had been reported in this cavity intermittently for over two weeks prior to the accident, and had been reported steadily for the last five days before the accident. The body of Jung Tow, the other Chinese working in this place, was found about 80 feet back from the face and in the return airway. He was right in the path of any gas moving from this cavity. He was not burned and is the only man in this section that was not burned. Both Hung Jung and Jung Tow used Edison electric safety-lamps; the cord from the battery to the head-light on Hung Jung's lamp had been severed by the falling cap-rock and the head-light damaged. Jung Tow's lamp was in good condition, and while the light was off when the body was found, through the cord being kinked by the position the body was in, the moment it was straightened out by the rescue party the light came on and the lamp burned as bright as if it had just left the lamp-station. A powder-can found in this place contained 2½ sticks of Monobel. There was a slight break in the roof for some distance along the edge of the barrier pillar being left between this section and No. 1 East section. This break no doubt had some bearing on the generation of gas in the return from this place.

No. 2 Place.

Working-face undisturbed; tools left where men had been working. Loaded car is standing at face of brushing. A pile of ties lying on the right side of the roadway are undisturbed and a piece of singed paper is lying on top of them. The body of Louie Long, a Chinese, was found on the roadway 25 feet from the face, head pointing outwards and face downwards. He was burned. The body of Jung Kept, his partner, was found 125 feet back from the face, on the roadway; he had also received burns. A curtain 130 feet back on the roadway was destroyed and the remnants carried outwards. There was a powder-can in this place containing 4 lb. of Monobel.

No. 3 Place.

On the face-line between Nos. 2 and 3 places there is a cave of cap-rock, but this cave was there several shifts before the explosion occurred. A loaded car is standing in this place undisturbed and brattice-boards lying alongside of this car were not moved. Drilling-machine, drills, and other tools, such as pick, shovel, and axe, were lying at the face in the position they had been in use. A sweater-coat was hanging on a post about 25 feet back from the face; this coat showed little signs of having been singed. The body of Choy Duck, one of the Chinese employed in this place, was found on the low side of the place, head pointing uphill towards the roadway. This body had received burns. The body of Sick Quee, another Chinese, was found 60 feet back on the roadway, head pointing outwards and face down. He had also received burns. A curtain erected 90 feet back from the face was destroyed, the remnants being scattered outwards.

No. 4 Place of No. 2 Dip-slant.

This is the bottom place on the wall; there is a small cave of cap-rock on the face between roadways Nos. 3 and 4. This cave was there prior to the explosion. A loaded car of rock is standing at the face undisturbed. An axe, hammer, and bar of drilling-machine are lying at the face undisturbed, and the machine-stand and drills are on the projecting portion of the cog-sticks on the low side of the roadway. One of the miner's electric safety-lamps was found 40 feet back from the face; evidently the miner had not been wearing it when the explosion occurred, and he had run out and left it, running out by the light of his partner's lamp. The bodies of these two Chinese, Jung Ding and Jung Woy, were found about 90 feet back from the face, on the roadway, head pointing outward and face down. They had both received burns.

Proceeding up this slant, at the entrance to No. 2 place a post is blown out in an outward direction towards the level. On No. 1 dip-slant there are not many signs of force; the curtain is destroyed and the remnants are found scattered in both directions. Proceeding out on No. 2 counter-level, very few signs of force are found. Small pieces of chips and paper are lying around and have apparently not been moved. The stopping between the two levels appears to have been shaken down by the concussion, and there does not appear to be much force in any direction, but, if anything, it is towards the main level. No distinct signs of force are found until a small fan is reached which was in the process of being installed for a booster. This fan was turned over on its side in a downward direction, as if a portion of the force had been expended down this slant and continued down the counter-slope.

LINES OF FORCE OF EXPLOSIVE BLAST.

All lines of force point outward from No. 2 East section to the slope, except a small portion of the distance at the inner end of No. 2 East level. Beginning at a point approximately 90 feet back from the face of the level, there is an inward force both on the roadway and behind the cogs on the rise side of the roadway. A curtain that was located back on the roadway was carried into the face by the blast, and remnants of it were found driven into the cross-sticks of the cogs on the roadside. The inside cog on the rise side of the roadway was moved inward and downwards. The cogs forming the pack-wall on the high side of the roadway, just inside of where the body of Jung Tow was found, are bulged outwards into the roadway, as if they had been subjected to some force from behind the pack-wall. The force, after travelling into the face of the level, then passed down the face and out of each roadway to the slant, up the slant, and out along the Main level. Strong signs of force in an outward direction are shown at the trip of cars and dead mule on this level. This force continued outward and blew two doors and half-stoppings outward, passing on outward to the siding. The most of the force is shown going this way to the slope, but there are also signs of a downward force in the outside slant and down the counter-slope. Much force and violence is shown on the siding, all the cars being forced outwards and jammed into a heap. The body of the Chinese driver found on this siding was completely stripped of clothing; one boot was left on and the other torn off. After reaching the slope the force is divided three ways, going up the slope, down the slope, and in No. 4 West level, which is almost opposite No. 2 East level. After splitting on the slope the force of the explosion is expended in a distance varying from 700 to 1,000 feet in each direction. Many more signs of heat are shown in No. 4 West level than in the other two directions, and it would appear that the dust on the siding at the entrance to No. 4 West level may have assisted in the propagation of the flame for some distance.

DEDUCTIONS AS TO POINT OF ORIGIN OF THE EXPLOSION.

The lines of force and conditions found indicate the point of origin as being behind the pack-wall on the rise side of No. 2 East level. No men escaped out of this section. Survivors from all other parts give testimony that it did not originate in any of the other sections. A short review of the conditions existing in the section prior to the explosion will support the theory that the rise side of No. 2 East level was the point in that section where the explosion originated. Explosive gas had been found and reported on the rise side of this level intermittently for over two weeks, and had existed there practically steadily for five days prior to the explosion. Evidence given at the Coroner's inquest by the firebosses in charge of this section, if correct. would indicate that the amount of gas in this particular place at times assumed serious proportions.

Extracts from the Evidence as given at Coroner's Inquest by R. Barker, Fireboss on the Night Shift Prior to the Explosion.

"Q.—What particular part of the mine did you work in? A.—2 East slope.

"Q.—No. 4 mine? A.—Yes.

"Q.—You viewed the works on the night of the 7th and the morning of the 8th? A.—Yes.

"Q.—You found conditions normal, you say—how did you find them? A.—Normal, just the ordinary conditions—same as usual.

"Q.—I would like to ask, did you find any gas in that place at all? A.—Yes.

"Q.—What particular place did you find gas? A.—In the high side of 2 East level.

"Q.—There wasn't any quantity that you would consider dangerous? A.—No.

"Q.—What was the extent of the explosive gas on the 8th? A.—The quantity you mean. Very little on the 8th; that place is severed with faulty coal and rock and the height would be about 9 feet.

"Q.—Did this body of explosive gas reach to the direct facing? A.—No.

"Q.—Did you have men working there? A.—Two.

"Q.—In that particular level? A.—The same level, the same place.

"Q.—How far from the actual face would that explosive gas be? A.—I should reckon 7 or 8 feet; something like that, I guess.

"Q.—From the time you fired the shot? A.—Where I fired the shot was quite a distance from where I found the gas. I fired the shot on the high side.

"Q.—On the high side of the working-face of 2 East level? A.—Yes.

"Q.—At the time you fired the shot, what was the distance from the actual position to where you found this gas? A.—I should reckon about 12 or 14 feet. Something like that. That is the distance from the shot to the high side.

"Q.—From the distance of that shot, you refer to the nearest point where you found gas? A.—About 12 feet.

"Q.—This gas was found after you fired this shot? A.—Yes, after.

"Q.—How long after did you find it? A.—After I examined the place.

"Q.—Did you find any gas before you fired the shot? A.—No.

"Q.—That would be the face—the tail of the gas nearest the face you refer to; how far did that extend—the other end of the gas from the face back? A.—I couldn't say.

"Q.—You didn't examine that? A.—No, I didn't go back.

"Q.—You really don't know the extent of that body of gas? A.—No, I didn't go back.

"Q.—What time did you fire that shot? A.—I reckon between 4 and half-past 4 o'clock.

"Q.—How far would you inspect that high side prior to the firing? A.—To where the men worked on the corner.

"Q.—Did you find out the extent of the gas on the high side of 2 East? A.—I didn't go back along the rib.

"Q.—Did you leave men in the place after you came back? A.—Yes.

"Q.—Did you erect a fence so they couldn't enter it? A.—I told them to erect a fence.

"Q.—How many men were working? A.—Two Chinamen—just two Chinamen.

"Q.—Barker, when you examined this place did it not occur to you to see just how much gas there was there? A.—To see?

"Q.—Yes. A.—No.

"Q.—You barricaded the place off? A.—Yes.

"Q.—Do you think there would be much gas? A.—There wasn't much gas. No."

EXTRACTS FROM EVIDENCE AS GIVEN AT CORONER'S INQUEST BY R. WALKER, FIREBOSS ON THE MORNING SHIFT THE DAY OF THE EXPLOSION.

Robert Walker, sworn, in giving testimony said he found a small cap of gas in 2 East level. In cross-examination he stated as follows:—

"Q.—Mr. Walker, before taking charge, did you read the report of the previous fireboss? A.—I initialled it. I did.

"Q.—Did he give you any bearing on the conditions? A.—Yes.

"Q.—As to what? A.—He told me there was gas on 2 East level that morning.

"Q.—Did you examine that for yourself? A.—Yes.

"Q.—What did you find? A.—I examined it; it wasn't bad, just a small cap. It didn't extend back at all.

"Q.—You found explosive gas? A.—Yes.

"Q.—How far was that from the working? A.—We have a line up for the return. You go along the top rib, and there was a hole on the first cog and up at the back.

"Q.—How many feet from the working-face? A.—Where it was tailed out about 12 feet from the nearest place.

"Q.—It was there when you began the shift? A.—Yes.

"Q.—It was there on your final examination? A.—It was for the better, I believe.

"Q.—Did you go to the return end of that explosive gas? A.—Between the second and third cog.

"Q.—Going farther back? A.—It was clear.

"Q.—What was the distance from the closest point of the face where you found that gas to the farthest point where you found the gas? A.—About 12 feet between the second and third cog.

"Q.—About what height above the floor did you find that? A.—About 8 feet. Above my head.

"Q.—How far from the roof to that point? A.—18 inches.

"Q.—At least it would be 18 inches volume of gas there? A.—Yes.

"Q.—You considered there was 18 inches of gas in that place on the high side? A.—Yes, a cavity there.

"Q.—The place is 9 feet high? A.—From 8 to 9 feet high.

"Q.—You got the gas 5½ feet? A.—About the height of my head.

"Q.—5½ feet from 9 would give you more than 18 inches? A.—From the 9 feet.

"Q.—That would be more like 3½ feet than 18 inches? A.—I consider myself 5½ feet and my lamp was there.

"Q.—If it was 9 feet high there would be more than 18 inches? A.—There might be an inch or two difference.

"Q.—More than an inch? A.—An inch or two.

"Q.—A foot or two difference. Did you fire any shots on that shift? A.—No, not in 2 East."

A careful perusal of the evidence of these two firebosses shows that for sixteen hours prior to the time of entry of the shift on which the fatal explosion occurred conditions in the immediate vicinity of the face of No. 2 East level were not very good. Barker, the night-shift fireboss, states he found explosive gas 7 or 8 feet back from the face. He also admits firing a shot in this place, and he had not examined the place farther than the high side, where the men were working. He further states he did not know how far back the explosive gas extended, as he did not examine the place far enough back to ascertain the exact condition.

Walker, the morning-shift fireboss, gives very conflicting evidence. First he stated there was only a cap of gas; then he admits explosive gas was found 18 inches from the roof, behind the cogs, 12 feet back from the face. In further cross-examination he states he got explosive gas 5½ feet from the floor and the place was 9 feet high. This would give explosive gas 3½ feet down from the roof in the cavity. From a sifting-down of this evidence it can almost be conceded that there was, on an average, a depth of approximately 2½ feet of explosive gas in the higher part of the roof-line behind the cogs in No. 2 East level on the morning shift prior to the explosion.

Taking an average of 2 feet of depth at the cavity, and making calculations from detail plan, where this body of explosive gas would tail out on the level, there would be approximately 236 feet of methane, exclusive of any that may have existed in the vacancies in the pack-wall. It is on the return side of where this gas was reported that the body of Jung Tow was found, and all the lines of force of the explosive blast radiate from this point. After carefully reviewing all the conditions as found after the explosion and conditions prior to the explosion in this section, and circumstances surrounding the location of Jung Tow's body, *I must conclude the point of origin of this explosion was in the return airway from No. 2 East level, in the vicinity where the body of Jung Tow was found.*

CAUSE OF IGNITION.

In reviewing the possible cause of ignition, the most of the usual causes of ignition as assigned to colliery explosions can be eliminated. No naked lights were used, the Edison electric safety-lamp being used exclusively, except by firebosses. No shots had been fired in that section for some time prior to the occurrence of the explosion, as the fireboss, who also acted as shotlighter, had after leaving this section on his first round been through No. 3 East or Diagonal section, and had just had lunch preparatory to commencing his second round. His body was found at the inner end of the siding at the entrance to No. 2 East level and his shot-firing battery was strapped to his body. His case containing detonators and cable and stick were all found a short distance from his body, as was his flame safety-lamp. This lamp was undamaged and in good condition. This was the only flame safety-lamp in use in that section.

There was no electric power within 500 feet of the face, and within 640 feet of the point of origin of the explosion. The most striking feature in this section, in looking for a possible source of ignition, is the location of Jung Tow's body to the point of origin of the explosion. There can be no legitimate reason advanced for his being where he was found. He was right in the return airway on the high side of the pack-wall and also on the return side of the accumulation of explosive gas reported. There was absolutely no reason why he should be there, except for some illegitimate purpose, and it is just the place where it would be expected to find a person who had some illegitimate act in mind, such as smoking, etc., as he was in a place where no one except the fireboss could be expected. The fireboss or any other person coming in the level would come along the roadway, and Jung Tow, behind the pack, would hear them as they went along the level, and he would have ample warning of their approach. His position behind the pack-wall and in the return was such that any smell of smoke, etc., would be carried into the old workings of No. 1 East section, where there would be no likelihood of detection. There was no incriminating evidence found on Jung Tow's body or by a cursory examination in the vicinity of the body, but the writer was so impressed with conditions surrounding this body that he requested that a thorough and diligent search among all the debris be made, and in compliance with this request a gang of men were put on to move and thoroughly search among all the debris. This was done by moving all the larger pieces and putting the smaller through a sieve, with the result that after three men had worked for two days and five men for three days a match with just the head burnt off and a piece of paper similar to a cigarette-paper was found about 10 feet from the body of Jung Tow. None of the lamps in this section were damaged, except the one found with the body of Jung Dong at the face of No. 2 East, and this one had been damaged by the cave which fell on him, the cord being severed and the headlight damaged.

The only other source that could be considered as having a remote possibility of causing ignition would be the electrical apparatus in this section. It came out in the evidence at the inquest that the outside door at the entrance to No. 2 East level had been left standing open after a trip had been pulled out, and had been closed by Martinello, the tracklayer, some time before the occurrence of the explosion, which fact he reported to A. W. Watson, the fireboss in charge of Nos. 2, 3, and 4 West districts.

One of the possibilities that was presented in the early stages of the recovery-work was, could this door being left open for any appreciable length of time have any effect on the generation of gas in the lower workings, and this gas, coming up from the lower workings, have become ignited in any way. Any body of gas coming from the lower workings would pass the electric pump. After the workings in No. 2 East were explored, the evidence that the point of origin had been on the high side of No. 2 East level was so overwhelming that the other possibility could be discarded. The possibility of the lower workings having any bearing on the accident was fully exploded when a visit was made to that point, and it was found that with the ventilation totally destroyed for several days there was no explosive gas in that section, except a little in a pot-hole in one place. So it was very apparent that if no gas had generated with the ventilation entirely cut off for several days, the possibility of it doing so with one door open for a short time is very remote, as the seam is not subject to sudden outbursts. Two firebosses were in these workings at the time the door was reported open, and they observed no change in conditions, so the theory of a point of ignition at the electric pump can be eliminated. So far as the motor-driven compressor is concerned, the ventilation would be benefited by the outer door being open. Apart from everything else, the evidence that the explosion originated and travelled from the inside of No. 2 East level is so complete and convincing that there is absolutely no doubt in the writer's mind that the point of origin was on the high side of No. 2 East level. After the whole situation and circumstances surrounding this accident are reviewed, and careful thought given to every possible angle, *indications are that the cause of ignition was a match lighted for some illicit purpose close to where the body of the Chinaman, Jung Tow, was found in the return air from No. 2 East level and in the vicinity of where explosive gas was known to exist.*

If the evidence of the firebosses as given at the inquest is to be credited, this Chinaman had gone beyond a danger-fence in contravention of the "Coal-mines Regulation Act" and special rules for a distance of some 60 feet. Personally, after listening to the evidence given by these firebosses, I am skeptical about the fact of there ever having been a fence erected.

INQUEST.

The adjourned Coroner's inquest was held at Cumberland on February 16th, 1923, at which the writer was present and given permission to question the witnesses. After hearing the evidence of twenty-three witnesses the jury brought in the following verdict:—

"We, the undersigned jury, empanelled to inquire into the death of William Whitehouse and thirty-two others, find from the evidence given by the witnesses that these men met their death by an explosion of gas which occurred on February 8th, at 7.15 p.m., in No. 2 East level, off No. 4 slope, off 15 West level, No. 4 mine, Cumberland, B.C.

"Cause of explosion 'unknown.'

(Signed) "J. Walton, *Foreman.*
"J. A. Brownsey.
"D. Harling.
"Wm. Davidson,
"Mathew Brown.
"Thos. Ripley.
"F. Slaughter."

SEARCH OF BODIES.

The bodies when sent out of the mine were taken charge of by Provincial Constable A. Dunbar and Corporal W. H. Cope, R.C.M.P. These officers searched all the bodies and a copy of their findings was put in for exhibit at the Coroner's inquest and sworn to as being correct.

GENERAL COMMENTS.

Mine-rescue Apparatus.

The largest loss of life in this explosion is not due to the actual violence of the explosion, but is, as is usual in most colliery explosions, due to the deadly effect of the after-damp. Nineteen out of the thirty-three, or practically 58 per cent., succumbed to the effects of the after-damp after they had travelled distances varying from 1,000 to 1,200 feet on their way out, and some of them had come to a point of within 70 feet of reaching safety. It would appear that if any large effectual life-saving is to be done, it will have to be through some type of portable apparatus that can be carried around by the miners and donned quickly by them after an explosion occurs, similar to the method employed at the Front, when soldiers donned gas-masks to prevent injurious effects from poisonous gas attacks. An apparatus of this kind would be ineffectual in an atmosphere where the oxygen content is completely destroyed or very low, but in the case of the escape of men from other districts that have not been affected by the explosion, except possibly by a limited quantity of smoke or after-damp which may have leaked into the district through the disarrangement of the ventilation, it would be very effectual. With some portable apparatus of this type, it is highly probable that nineteen of these men would have escaped from this explosion, as no doubt the oxygen content was sufficient to sustain life. Good work is done by rescue crews equipped with the larger type of rescue apparatus, but by the time crews are organized and equipment transported to the scene of accident valuable time is lost, and employees who have been uninjured by the explosion rush out to try and reach safety, with the result that many are quickly overcome by the deadly after-damp. In rare cases rescue is effected where men have stayed in their working-places or near the face, as in this particular case, where several men were rescued several hours after the explosion occurred, but the majority of the men had rushed out of their places and were within a few feet of safety when overcome. As an illustration it may be pointed out that the men who were overcome and lost their lives probably reached the place where they were overcome within five minutes after the explosion occurred, whereas to get rescue apparatus from the station and organize the crews and reach this point, which was some 2½ miles underground, required about two hours. If the portable mask called the "self-rescuer," which is now being thoroughly investigated by the Department of Mines, can be perfected, and it will last, say, for one hour in an atmosphere containing after-damp, but with sufficient oxygen content to sustain life, a similar loss of life might possibly be avoided. And I am of the opinion it will be much more effective in saving life than any of the present mine-rescue apparatus in use to-day, for the simple reason that the uninjured men in a mine after an explosion would have something

which would give them immediate protection against a foul atmosphere, whereas in the other case they have to trust to luck and speed that can be made by the rescue party coming from the outside, and even though rescue may be effected speedily, the effect of the exposure to the deadly atmosphere may have been fatal.

The Department of Mines of British Columbia are to be complimented for the quick action they have taken in investigating the possibilities of this self-rescue mask.

COAL-DUST.

The part of the mine where the explosion occurred cannot be classed as dusty, yet there is no doubt dust assisted in the propagation of the explosion. The explosive blast had followed the haulage-roads, and no doubt the dust made by the grinding of the car-wheels over coal that had fallen off the cars, and by leakage from damaged cars, played a part in the propagation. The dust in this mine has a high incombustible content, but it apparently is not high enough to prevent propagation.

OFFICIAL REPORTS.

From the reports of the firebosses, it is difficult to determine the actual condition that exists in places where explosive gas is found. In most cases the report will read: "Explosive gas found, etc."; no idea being given as to the quantity found. Or if a gas-cap is found, the report will read: "Found gas-cap, etc."; giving no idea as to the size of the gas-cap or the percentage of methane that may be travelling in the air. From the evidence given at the inquest, it is apparent that the officials actually in charge of operations at the faces do not give enough serious thought as to the dangers existing, by allowing miners to continue at work at the face when accumulations of explosive gas are present in the vicinity. This was brought out very plainly at the inquest by the cross-examination of the firebosses in charge of this district on the night and morning shift prior to the explosion, and given in another part of this report. When the evidence of the fireboss on the morning shift would indicate that there was at least 236 cubic feet of methane, the inner end of which was within 12 feet of the working-face, present when he visited No. 2 East level on one of his rounds, yet he admits in his evidence he allowed the men to remain at work. What the conditions were during the afternoon of the explosion unfortunately cannot be ascertained. The only evidence that can be secured on this point is what can be gathered from the conversation Fireboss A. W. Watson had with Fireboss Whitehouse just prior to the explosion. He states Whitehouse told him conditions in No. 3 East were good, but he did not mention No. 2 East section. In all probability upwards of three hours had elapsed since the time of Whitehouse's first visit and the time the explosion occurred. In the meantime, during his absence, if a condition similar to the one found by the morning-shift fireboss had arisen, it is easy to realize what would happen if a match was lighted in that vicinity. It would seem advisable that in a place where conditions arise as in No. 2 East level no one but the most skilled and careful miners should be allowed to work there.

It has been clearly demonstrated, both at this explosion and the one previous, that small accumulations of explosive gas are very dangerous in this mine when working on the long-wall system, as no doubt the explosion is fed by gas drawn out of the breaks in the roof, which are inaccessible from examination.

If the evidence of the two firebosses as given by themselves at the inquest is to be credited, it is very apparent they are not making reports showing the actual conditions, and these reports are misleading to their superior officers as to what the conditions are at times. And some of them are not carrying out the provisions of the "Coal-mines Regulation Act" at times regarding blasting. The night-shift fireboss admits in his evidence that he fired a shot on the high side of No. 2 East level at half-past 4 on the morning of February 8th, and that after firing this shot he found explosive gas about 12 feet away from where he fired the shot, and he further admits he did not examine that far back before he fired the shot. The "Coal-mines Regulation Act" requires that he shall examine all places contiguous thereto for a radius of 25 yards, or 75 feet.

MATCHES AND SMOKING MATERIAL.

There was found in the mine during the time of mine-rescue operations two boxes of matches and a package of cigarette-papers, and later a burnt match was found on the high side of No. 2 East level. One of the boxes found by Inspector Jackson carried the trade-name

of Henderson's store at Cumberland. These two boxes of matches that were found were at points that had no bearing on the explosion. There were two convictions against employees having matches and smoking material in their possession in this mine during October and November, 1922. One received a sentence of thirty days' imprisonment with hard labour, and the other three months' imprisonment with hard labour. The practice of employees taking matches and smoking material into the different mines in British Columbia is getting so serious that some drastic measures will have to be taken to stamp it out. There were eight convictions at the Cassidy mine, operated by the Granby Consolidated Mining, Smelting, and Power Company, during 1922, and the maximum penalty given was a fine of $10 and costs. Six of these eight were caught on one day, November 10th, 1922. In addition to these at Cassidy, there was the two mentioned at Cumberland, three at Coal Creek, and one at Nanaimo. When odd searches result in finding so many carrying matches and smoking material, it is safe to assume that on the many that were not searched during the year there would be a good deal more of the same material carried. Given below are the prosecutions and penalties inflicted during 1922:—

PROSECUTIONS UNDER "COAL-MINES REGULATION ACT" DURING 1922.

Date.	Name.	Mine.	Occupation.	Offence charged.	Judgment.
Jan. 8	Chas. Ferrari	Coal Creek	Miner	Having matches and cigarettes, violation Rule 9	Fined $10 and costs.
Jan. 8	D. Ferralli	Coal Creek	Miner	Same offence	Same fine.
Jan. 8	C. Fonti	Coal Creek	Miner	Same offence	Same fine.
Feb. 1	Joseph Parisee	Granby No. 1, Cassidy	Miner	Having matches and tobacco contrary to Gen. Rule 9	Fined $10 and costs.
Feb. 1	Angelo Cicido	Granby No. 1, Cassidy	Miner	Same offence	Same fine.
Oct. 22	Robert Casely	No. 4, Comox	Tracklayer	Same offence	1 month's imprisonment with hard labour.
Nov. 10	A. J. Albertson	Granby No. 1, Cassidy	Miner	Having matches contrary to Gen. Rule 9	Fined $10 and costs.
Nov. 10	John Mills	Granby No. 1, Cassidy	Miner	Same offence	Same fine.
Nov. 10	John Mackey	Granby No. 1, Cassidy	Miner	Same offence	Same fine.
Nov. 10	Andrew Landusky	Granby No. 1, Cassidy	Miner	Same offence	Same fine.
Nov. 10	Arthur W. Hughes	Granby No. 1, Cassidy	Bratticeman	Having matches contrary to Gen. Rule 9	Fined $10 and costs.
Nov. 10	James Stewart	Granby No. 1, Cassidy	Trackman	Same offence	Same fine.
Nov. 21	Chow Sing	No. 4, Comox	Helper	Having matches in possession contrary to Rule 9, also cigarettes	3 months' imprisonment with hard labour.
Dec. 7	John Carson	Wakesiah, Nanaimo	Miner	Violation Gen. Rule 9	Fined $1 and costs.

In the classification of the above, there is one Oriental, one coloured, and twelve whites.

During 1923 to date there have been several serious offences, which are herewith given:—

PROSECUTIONS UNDER "COAL-MINES REGULATION ACT" DURING 1923 TO DATE.

Date.	Name.	Mine.	Occupation.	Offence charged.	Judgment.
Mar. 5	Louis Hadevis	Nanoose Colliery	Miner	Smoking in mine	Warrant for arrest.
Mar. 8	Mike Boladovitch	No. 4, Comox	Miner	Took a safety (flame) into the mine without same being examined by a "competent person"	Fined $10.
Mar. 19	John Slater	Middlesboro Collieries, Merritt	Labourer	Had a pipe in the mine	Fined $5.
Mar. 26	Jos. Mayovsky	Cassidy	Miner	Had a pipe in the mine	Fined $10.
Mar. 26	Thos. Cunliffe	No. 4, Comox	Shiftboss	Fired shots without making previous examination	Fined $10.
April 7	Henry Clark	Cassidy	Switcher	Breach of special rules	Fined $10.
April 7	Charles Bell	Cassidy	Driver-boss	Breach of special rules	Same fine.
April 7	Jas. Milligan	Cassidy	Rope-rider	Breach of special rules	Same fine.
April 9	Lim Kee Sing	No. 4, Comox	Miner's helper	Had matches in mine	3 months' imprisonment with hard labour.
April 10	Hichize Shirayama	No. 4, Comox	Miner	Had matches in mine	3 months' imprisonment with hard labour.
April 10	K. Nishi	No. 5, Comox	Miner	Had matches in mine	Not tried yet.

In the classification of the above there are three Orientals and eight whites.

In the case of Louis Hadevis, who was caught smoking in the Lantzville mine, Nanoose Colliery, who fled, and a warrant was issued for his arrest. An inquiry into his competency under the terms of section 48 of the "Coal-mines Regulation Act" was held on April 13th at Nanaimo by W. H. Wall, who after hearing all the evidence recommended that Hadevis's coal-miner's certificate of competency be suspended for a period of two years from April 13th, 1923.

From a perusal of the list of offences, it would appear as though surprise searches should be made at frequent intervals and prosecution made of any offenders.

The maximum pecuniary penalty allowed by the "Coal-mines Regulation Act" is $10 for any person other than an owner, agent, or manager. From this pecuniary penalty it jumps to imprisonment, if the Court is of the opinion that the case is one which was reasonably calculated to endanger the safety of the persons employed in or about the mine, or to cause serious personal injury to any of such persons, or to cause a dangerous accident, and was committed wilfully by the personal act, personal default, or personal negligence of the person accused. The maximum pecuniary penalty allowed is too small for serious offences, and it would appear an amendment to the Act should be made fixing a higher pecuniary penalty, as a fine of from $1 to $10 seems to almost condone an offence.

When the fact is considered that many lives may hinge on a single match in the hands of an ignorant or careless person, it would seem provision should be made for the infliction of stiffer pecuniary penalties.

SAFETY MEASURES.

The Canadian Collieries employ a safety engineer, who is a first-class certificated colliery manager with some twenty-seven years' experience in official capacities. His duties consist of making a monthly examination of all the mines and works operated by the company, and making a report direct to the general superintendent on the conditions found, and any recommendations he may have to make to safeguard operations. He has no other duties, his whole time being devoted to safety measures.

In addition to the safety engineer, there is an efficiency committee at each mine, which makes an examination of the underground works and reports conditions found, and makes any recommendations it may have for further safeguarding operations. This efficiency committee is composed of workmen and is chosen by the employees of the mine, but is paid by the company. There is also a gas committee appointed by the employees of the mine, under the terms of General Rule 37, "Coal-mines Regulation Act," to make an inspection of the mine on behalf of the workmen.

The above mentioned were all making regular inspections of the mine and posting reports. It seems deplorable that such an accident should occur, when so many efforts are put forward by the management in co-operation with the Mines Department officials on safety measures, but these committees and safety engineer, and also Government Inspectors, only see conditions as they are at the time of their examinations, and it remains a fact that local dangerous conditions can arise almost in any mine in a short time, and it is really the official locally in charge of a portion of the mine where conditions unfavourable may arise, and the workmen themselves actually working in there, who can really safeguard operations the most, and apply real safety measures by withdrawing from any dangers that may arise or by taking no risks when dangerous conditions exist.

In a mine of the magnitude of this mine, where it will take a person from three to four days to visit all the workings, there are times when the management must rely on subordinate officials assuming some responsibility, and they are dependent on the reports of these officials to keep them in touch with conditions. And these officials who are actively in touch at the faces daily are the ones who can apply the real safety measures, coupled, of course, with the co-operation of the employees themselves.

When a local official finds explosive gas, and is so indifferent in his duties that he does not try to ascertain the extent of the quantity of gas, and yet goes out and makes a report of what is supposed to be the true condition, or when he fires a shot without first making a proper examination of a place, he cannot be said to be carrying out safety measures in the spirit shown by his superior officers. The general safety operations can be taken care of by the management, but it is an utter impossibility for them to take care of all local contingencies that may arise. A careful checking-up of the various reports made reveals the fact that explosive gas, or even

a trace of gas, had been rarely found in No. 2 East section until a short time prior to the explosion.

The gas committee's reports for the month of November and December, 1922, and January 19th, 1923, show this section free from gas. There was no gas found by the efficiency committee in this section when it made its examination on January 20th, 1923. Inspector of Mines Jackson examined this section of the mine on January 27th, 1923, and reported it free from gas.

Mine Overman Williams examined this section on the morning of February 6th, 1923, two days prior to the explosion, and he found it free from gas, but gas was reported on the afternoon shift of the same day and continuous to the time of the explosion. Gas had been reported steadily from February 3rd until the 6th, when the place was reported clear both at 7 a.m. and 3 p.m. that date. The way the firebosses were reporting this gas would cause no undue alarm, as, with the exception of Barker's reports on the 7th and 8th, this gas is reported as a small quantity. The conditions were no doubt worse than reported at 3 p.m. and 7 a.m. on the 8th. The night-shift fireboss admits he did not know how much there was, while the morning-shift fireboss admits the gas was down 18 inches from the roof behind the pack, yet he reported at 3 p.m. a small quantity.

CONCLUDING REMARKS AND SUGGESTIONS.

The largest percentage of the accidents occurring in the mines of British Columbia are readily traceable to laxity or indifference on the part of the officials locally in charge of the workings, or the employees themselves. It may be charitable to give verdicts of "accidental death," "misadventure," and "error of judgment," but the fact remains that they could better be classed as downright carelessness or indifference.

With the object of eliminating to some extent the indifference and carelessness now displayed by the violation frequently of certain rules and regulations, I would respectfully recommend that the "Coal-mines Regulation Act" be amended to increase the maximum pecuniary penalty for violations to $100 instead of $10 as at present; and would further recommend that regulations be prepared and issued by the Department of Mines on the following:—

The standardization of the form of fireboss reports, so that the conditions in regard to inflammable gas will be given; by making it compulsory to give in cubic feet all explosive gas found; and gas-caps to be given in inches or fractions of an inch.

I have to thank, for the many courtesies shown me, James Dickson, Acting Chief Inspector of Mines; Thomas R. Jackson, District Inspector of Mines; Thomas Graham, General Superintendent of the Canadian Collieries (Dunsmuir), Limited, and his staff of officials.

Appended herewith are the following:—

(1.) Analysis of coal-dust samples collected.

(2.) List of fatalities and cause of death.

(3.) Plan showing No. 4 Slope section, and giving position of bodies after the explosion, and also lines of force of explosive blast.

(4.) Plan showing section of No. 2 East level, in detail, from the face to where the body of Jung Tow was found.

Respectfully submitted.

GEORGE WILKINSON,
Mining Engineer.

APPENDIX.

ANALYSIS OF COAL-DUST SAMPLES.

(Letterhead.)

Province of British Columbia.

Certificate No. 18060-1-2-3.

Bureau of Mines,
Victoria, March 16th, 1923.

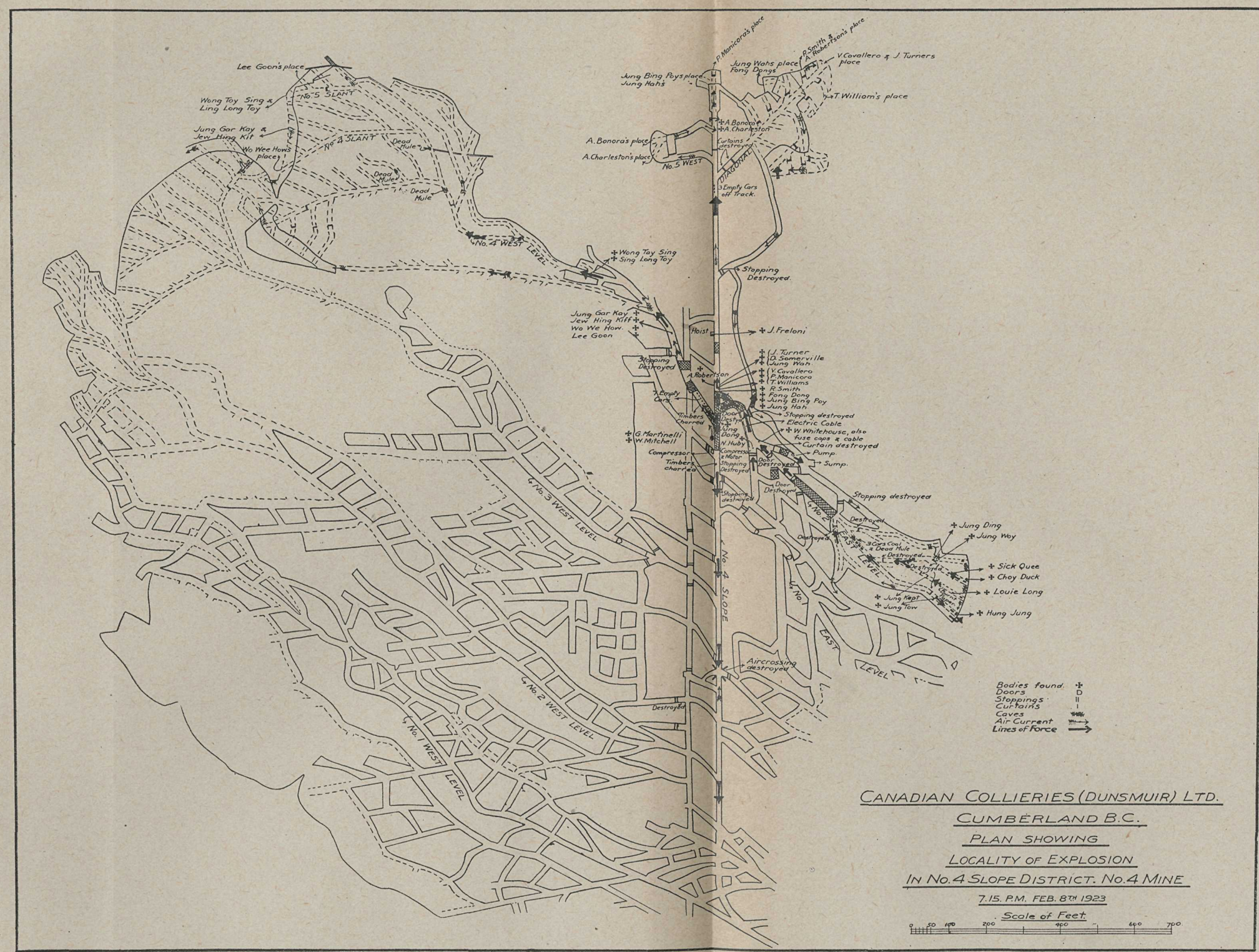
Government Assay Office.

Assay Certificate.

I hereby certify that I have assayed the following samples handed me by Mr. G. Wilkinson, Victoria, B.C. I find the same to contain:—

Depositor's Mark.	Description of Sample.	Analysis.	Per Cent.	Ratio $+\frac{F.C.}{V.C.M.}$
18060. Dust ...	No. 2 East, near inside slant, in vicinity of horse and trip	Moisture	1.4	Ratio 2.07.
		Vol. Comb. Mat.	18.7	
		Fixed Carbon	38.7	
		Ash	41.2	
18061. Dust ...	No. 2 East level, near face	Moisture	1.7	Ratio 1.99.
		Vol. Comb. Mat	18.0	
		Fixed Carbon	35.2	
		Ash	45.1	
18062. Dust ...	No. 2 East level, landing	Moisture	1.5	Ratio 2.07.
		Vol. Comb. Mat.	18.7	
		Fixed Carbon	38.2	
		Ash	41.6	
18063. Dust ...	No. 2 East, inside of landing	Moisture	1.5	Ratio 1.87.
		Vol. Comb. Mat	18.7	
		Fixed Carbon	35.0	
		Ash	44.8	

D. E. Whittaker,
Asst. Provincial Government Assayer.



CANADIAN COLLIERIES (DUNSMUIR) LTD.

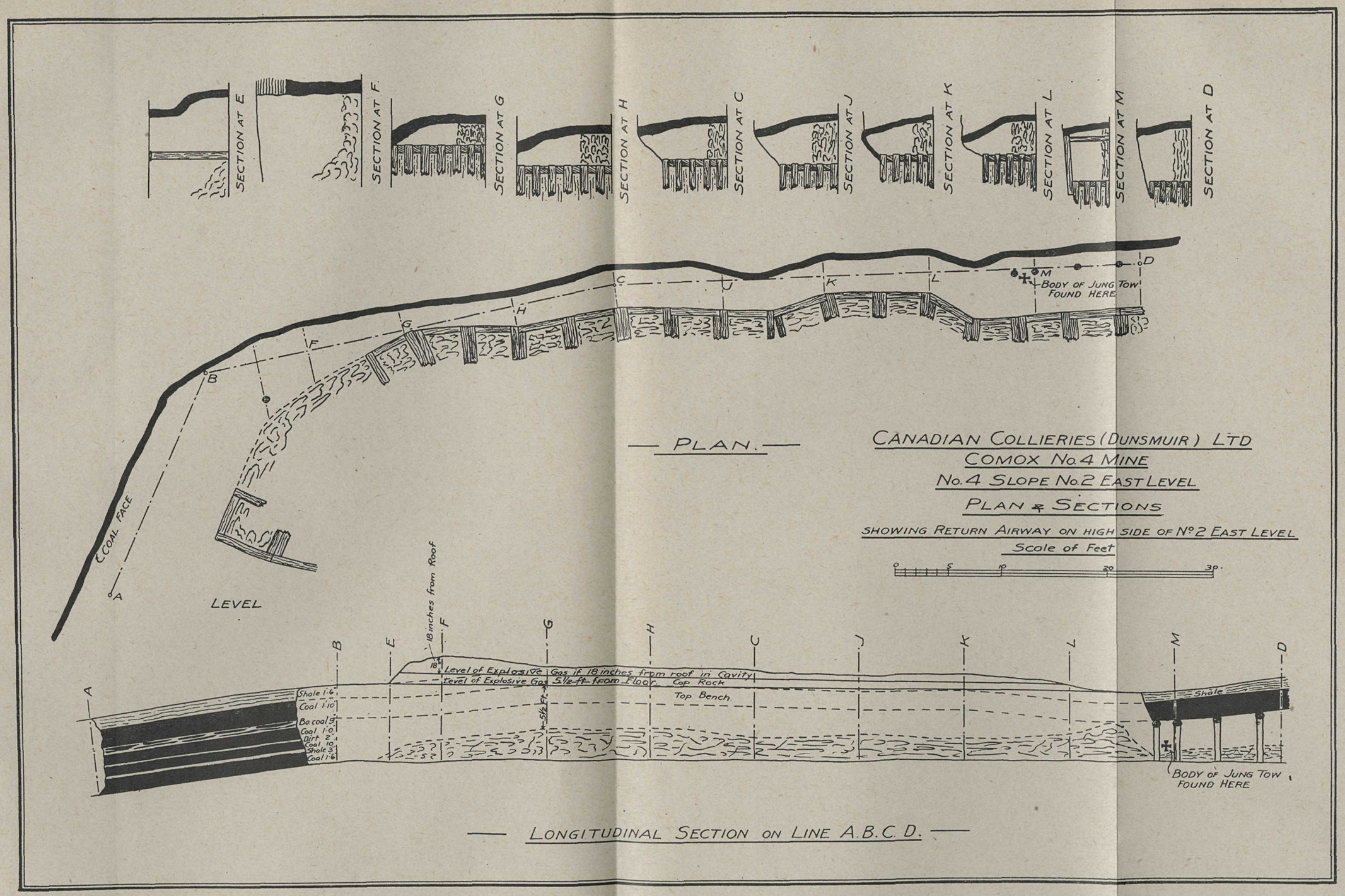
CUMBERLAND B.C.

PLAN SHOWING

LOCALITY OF EXPLOSION

IN No. 4 SLOPE DISTRICT. No. 4 MINE

7.15. P.M. FEB. 8TH 1923


SECTION AT E
SECTION AT F
SECTION AT G
SECTION AT H
SECTION AT C
SECTION AT J
SECTION AT K
SECTION AT L
SECTION AT M
SECTION AT D
A
B
F
G
H
C
J
K
L
M
D
BODY OF JUNG TOW FOUND HERE
COAL FACE
LEVEL
— PLAN. —
CANADIAN COLLIERIES (DUNSMUIR) LTD
COMOX No. 4 MINE
No. 4 SLOPE No. 2 EAST LEVEL
PLAN & SECTIONS
SHOWING RETURN AIRWAY ON HIGH SIDE OF No. 2 EAST LEVEL
Scale of Feet
0 5 10 20 30
18 inches from Roof
18"
Level of Explosive Gas if 18 inches from roof in Cavity
Level of Explosive Gas 5½ ft from Floor
Cap Rock
Top Bench
5½ ft
Shale 1·6
Coal 1·10
Bo coal 9"
Coal 1·0
Dirt 2"
Coal 10"
Shale 3"
Coal 1·6
Shale
BODY OF JUNG TOW FOUND HERE
— LONGITUDINAL SECTION ON LINE A.B.C.D. —

REPORT OF CAUSE OF DEATH.

SUBMITTED BY DR. MCNAUGHTON.

Name.	Cause of Death.
R. Smith	Poisoning from C.O.; shock from injuries; asphyxia.
G. Martinella	Poisoning from C.O.; shock from burns; asphyxia.
W. Mitchell	Poisoning from C.O.; shock from burns and injuries; asphyxia.
J. Freloni	Poisoning from C.O.; shock from injuries; asphyxia.
N. Huby	Poisoning from C.O.; shock from burns; asphyxia.
T. Williams	Poisoning from C.O.; asphyxia.
William Whitehouse	Poisoning from C.O.; shock from burns; asphyxia.
D. Sommerville	Poisoning from C.O.; shock from injuries; asphyxia.
A. Bonora	Poisoning from C.O.; asphyxia.
C. Cavellero	Poisoning from C.O.; asphyxia.
A. Charleston	Poisoning from C.O.; asphyxia.
J. Turner	Poisoning from C.O.; asphyxia.
P. Manicora	Poisoning from C.O.; asphyxia.
A. Robertson	Poisoning from C.O.; asphyxia.
Jung Bing	Poisoning from C.O.; asphyxia.
Jung Hah	Poisoning from C.O.; asphyxia.
Jung Dong	Poisoning from C.O.; shock from burns and injuries.
Hing Jung	Poisoning from C.O.; shock from burns and injuries.
Sick Quee	Poisoning from C.O.; shock from burns and injuries; asphyxia.
Jung Tow	Poisoning from C.O.; fracture fourth cervical; asphyxia.
Choy Duck	Poisoning from C.O.; shock from burns; asphyxia.
Jung Woy	Poisoning from C.O.; shock from burns; asphyxia.
Jung Ding	Poisoning from C.O.; shock from burns; asphyxia.
Jung Kept	Poisoning from C.O.; shock from burns; asphyxia.
Louise Long	Poisoning from C.O.; shock from burns; asphyxia.
Fong Dong	Poisoning from C.O.; asphyxia.
Jung Wah	Poisoning from C.O.; asphyxia.
Wo Wee How	Poisoning from C.O.; asphyxia.
Jew Hung Kit	Poisoning from C.O.; shock from burns; asphyxia.
Wong Toy Sing	Poisoning from C.O.; asphyxia.
Leung Toy Sing	Poisoning from C.O.; shock from injuries; asphyxia.
Jung Gar Kay	Poisoning from C.O.; asphyxia.
Lee Goon	Poisoning from C.O.; asphyxia.

VICTORIA, B.C.:
Printed by WILLIAM H. CULLIN, Printer to the King's Most Excellent Majesty.
1923.