SM-TULAMEEN 74(1)A

TULAMEEN COALFIELD EVALUATION

Associated engineering services Ltd

September 5, 1974.

AESL

P/C

I N D E X

SUMMARY & CONCLUSIONS

An open pit mining area along the western coal outcrop, comprising a strike length of 5000 ft., could yield 1.95 MM tons of coal at 10,000 B.T.U. per lb., and at a stripping ratio of 4.1 to 1. Calculations which arrive at these figures are based on sparse basic data. Within this limitation, it would appear that coal could be made available at the rate of 200,000 tons per year for a period of approximately 10 years, at a cost (based on 1974 prices) of 82¢ per MM B.T.U.

Because of the relatively poor basic information, more exploration of the mining area is recommended before any purchase options are taken up. This exploration should include tracing the coal outcrop beyond the known 5000 ft. strike length, bulk sampling of trenches, and bore-hole drilling to verify coal zone consistency.

HISTORY

The history of the Tulameen Coalfield has been described in some detail by H.M. Rice and W.S. Shaw in the reports of the Geological Survey of Canada dated 1947 and 1952 respectively (see app. 6, extracts from Shaw's report).

Coal was found about the turn of the century where it was exposed in Collins Gulch and later along the southwest boundary where it was exposed by the north branch of Granite creek (see map, app. 5). The Columbia Coke and Coal Company, succeeded later by the Coalmont Collieries, was organized to exploit the coal measures. An intensive exploration programme was begun to develop coal and considerable drifting and drilling was done along the northeast boundary between Collins Gulch and Fraser Gulch, a distance of some 6,000 feet. Unfortunately the coal was found to be badly crushed and unsuitable for the markets of the day. The development of the exposures along the Granite Creek proved successful and during the years 1919 - 1940, a total of 2,364,000 tons of coal was mined. Mining was confined to a seam some 7 - 12 feet thick, although some sporadic attempts were made to mine other seams within the measures. Excessive pressures limited the workings down the dip to a distance of about 2,500 feet.

Near the southeastern extremity of the coalfield, underground exploration and surface trenching, locally known as the Ruge-Vittoni prospects, was successful in locating the outcrop. The coal beds were found to be

turned up sharply and badly mixed with shale. It was not confirmed if this outcrop represented the main coal beds or if it was one of the lesser beds known to exist within the coal measures.

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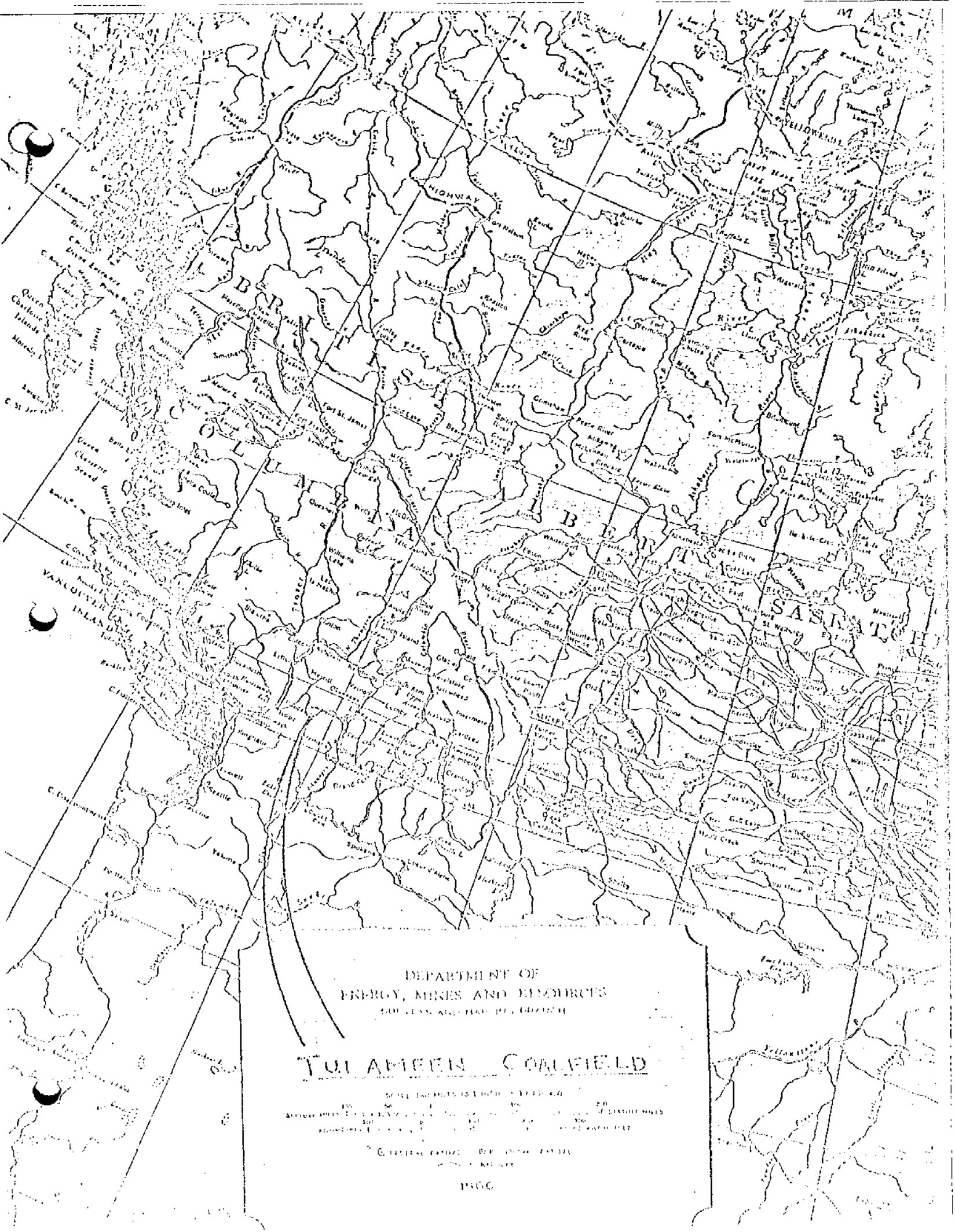
In 1954 the Mullins Strip Mine Co. Ltd. developed an open pit in the surface pillar adjacent to the old No. 3 Mine. A total of 238,000 tons of coal was mined and delivered to the Granby Mining Co. at Princeton. In addition, the Company carried out surface exploration by way of a series of trenches which confirmed the outcrop from Collins Gulch to Fraser Gulch, a distance of some 6,000 feet.

Subsequently Imperial Metals and Power Ltd. have carried out exploration programme by which a series of trenches outlined the outcrop for a further 5,000 feet northwest of the old No. 5 Mine.


BRITISH COLUMBIA
ALBERTA
SASKATCHEWAN
HIGHWAY
VANCOUVER
INLAND
DEPARTMENT OF
ENERGY, MINES AND RESOURCES
TUMBLER RIDGE COALFIELD
1966

BACKGROUND TO STUDY

A formal instruction was received on July 18, 1974 to carry out a preliminary appraisal of the coal deposit known as the Tulameen coal-field, near Princeton, B.C.

A meeting was held on July 23, 1974 in Vancouver at the offices of Imperial Metals & Power Ltd. to obtain background data. This comprised:

a) Part of a report by Wright Engineers Ltd. dated ( ) December, 1969. Ref. #1

b) A report by Denison Mines Ltd. dated January 11, 1974. Ref. #2

c) Aerial photograph mosiac.

d) 1" = 200' contour map of part of mining area. Ref. #3

e) 1" + 200' map of exploration trenches. Ref. #4

f) References to relevant Geological Survey of Canada reports.

Subsequently further reports were obtained:-

a) Wright Engineers Ltd. report dated May 5, 1967 Ref. #5

b) Cyclone Engineering Sales report dated November 19, 1969. Ref. #6

It was anticipated that evaluation of background data plus a visit to the property would allow an appraisal to be made within the terms of reference previously (but see later).

Inland Cement's requirements are for source of coal of approx. 10,000 B.T.U. per lb. heating value, total reserves of such coal to be app. 3 MM tons, available by strip mining methods to depths preferably not exceeding 200 ft. Annual coal requirements would be about 200,000 tons.

The purpose of the initial appraisal would be to determine the suitability of the property for further exploration and evaluation, possible extending to exercising purchase options. (refer AESL/RESCON proposal letter dated July 17, 1974).

From evaluation of the available data, it soon became apparent that there was conflicting information on coal quality, and a visit to site early in August, 1974 indicated areas of doubt on geological interpretation. It was agreed to obtain samples from trial excavations in pit areas to try to get more meaningful geological & coal quality data. (see resume of site visit app. 2)

COAL QUALITY

With the relatively sparse data available it is difficult to make accurate assessments of the yield of clean coal (10,000 B.T.U./lb.) from the coal zone proposed to be mined. Table 1 sets out the various analyses available and some comment should be made before any conclusions are drawn.

1. The precise location of boreholes 2, 3, 4 & 5 is not known, except they are roughly as indicated on the sketch plan, appendix 3. The results from #5 borehole should be ignored, as part of the sample was "presumed lost". The average yield from the other 3 boreholes is 30.6%. Coal zone thickness is reported as 70 ft., average dip 40°.

2. Recent channel sections from trenches A & B indicate yields of app. 70% on the sampled coal (see appendix 4). In both trenches the channel was selective, being a section of cleaner coal within the total exposed zone. In trench A the remainder of the coal zone was a series of narrow layers of coal, dirty coal, fireclay and shale of such overall poor quality as to be considered not worth mining. In trench B, the section sampled was the middle bench (see figure 1).

3. In trenches D and E the exposed coal zone was more closely allied to that in Mullins Pit and a clean coal yield of 65% is assumed on the total coal zone.

TABLE 1

	Trench A Aug '74	Trench B Aug '74	Mullins Pit Dec '73	I.M.P. #1	Aug. 1969 #2	#3	I.M.P. 200 lbs Aug 1969	Wright Engineers Boreholes 1966 #2	#3	#4	#5
RUN COAL (DRY BASIS)											
ASH%	30.1	31.7	23.68 (30.38?)	19.65	12.93	8.85	22.27				
V.M.%	30.1	32.45	27.03	34.73	38.87	38.34					
F.C.%	39.8	35.85	40.61	44.95	47.38	52.06					
S%	0.33	0.54	0.49	0.54	0.48	0.57					
B.T.U./lb.	9105	9031	9344	10800	11860	12830		7318	6537	6777	7733
PICKED 2 1.6 (S.G.)								FLOAT S. G. UNKNOWN			
YIELD %	74.0	67.5	65.0				80.23	30.1	31.9	29.9	24.7
ASH%	13.4	20.17	11.25				8.51				
V.M. %	33.7		32.38								
F.C. %	52.9		54.14								
S %	0.50		0.67								
B.T.U. /lb.	10610	10523	12000					10232	9822	10257	10874

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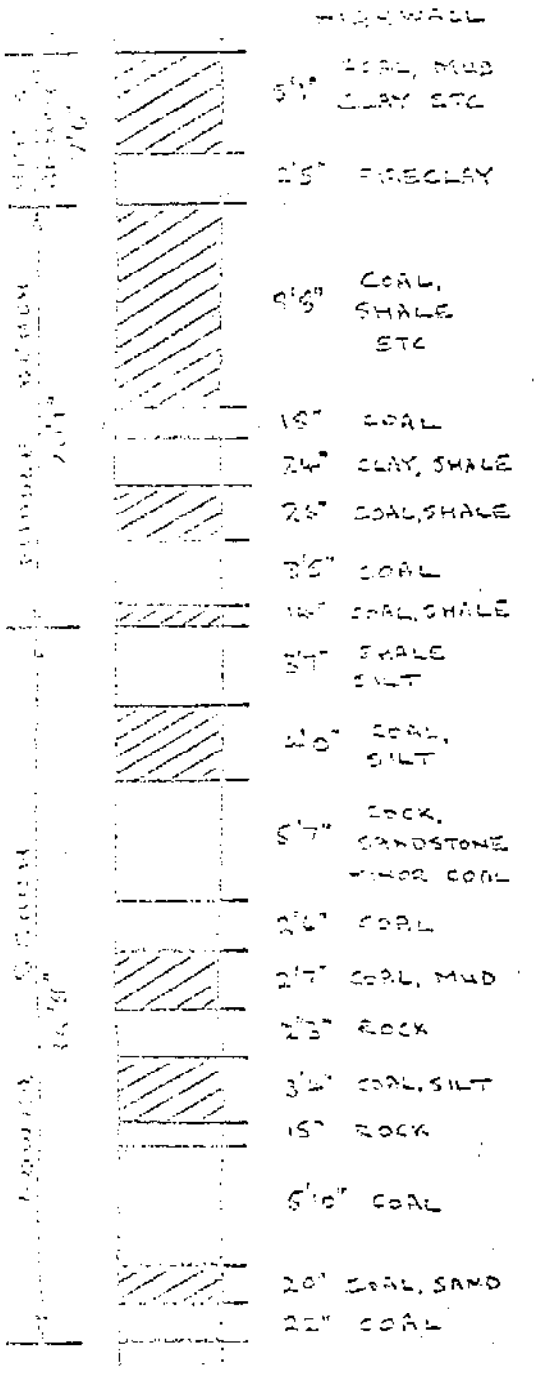
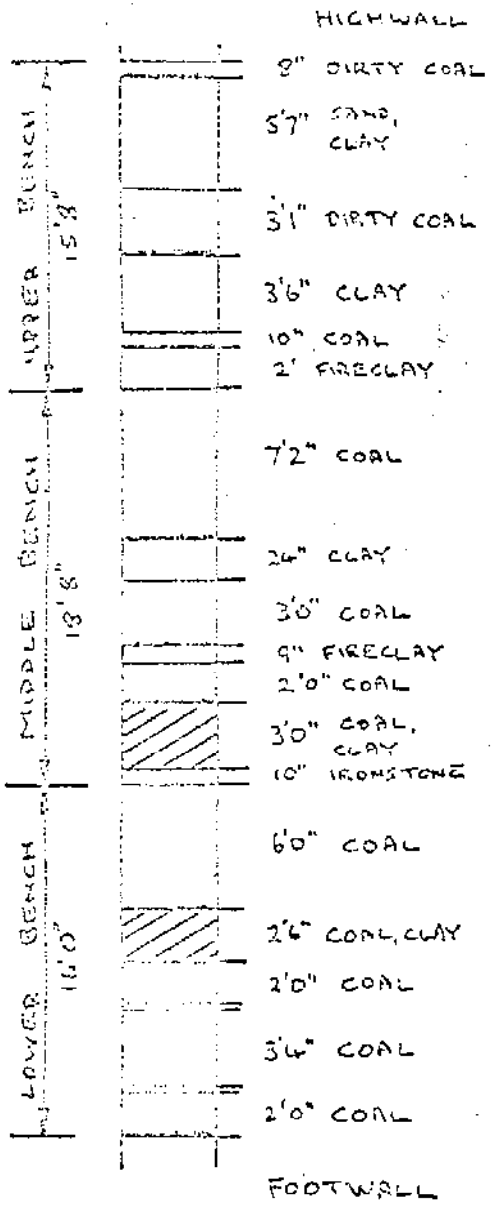
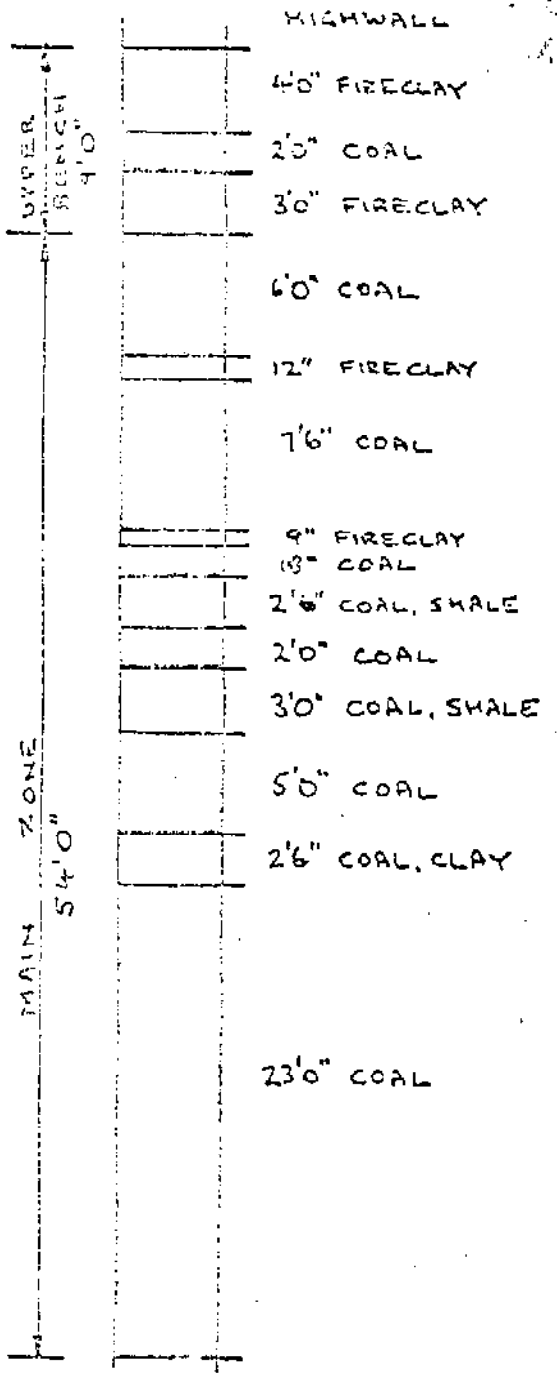
TRENCH B



TRENCH C



TRENCH D



SIMPLIFIED GEOLOGICAL SECTIONS

SCALE 1" = 10'0"

Fig. 1

In order to arrive at an average clean coal yield figure, and from this calculate clean coal reserves in the area of favourable surface dip slope, table 2 has been drawn up. From this it can be seen that in the 5000' length of strike under consideration, the average effective clean coal thickness is 26.23 ft. This figure must be adjusted for mining and washing efficiencies, this is taken as 90% overall.

It would not be possible to obtain a low enough ash content in the product coal by means other than 'wet' preparation.

Several problems are created by the implication of a coal preparation plant.

1. Unless extreme care is exercised in mining the coal zone, ensuring that contaminated benches are wasted, the washing yield would be very low - down to 50% or less. A sophisticated plant design could take care of this, but for the size of operation projected, such a design would be unwarranted.

2. The fireclay bands in the coal could break down to fine clays, causing water clarification problems.

3. Cost of drying the clean coal to 6% moisture would be high, as it would be necessary to use screen-bowl centrifuges which are expensive and also long delivery items. Thermal drying would be out of the question from a cost standpoint.

TABLE 2

TRENCH	MINEABLE THICKNESS FEET	ESTIMATED CLEAN COAL YIELD	EFFECTIVE CLEAN COAL THICKNESS FEET
A	12.0	70%	8.4
B	54.75	55%	30.25
C	34.67	70%	24.27
D	54.0	65%	35.1
E	51.0	65%	33.15
Average	41.28	63.5%	26.23

AVERAGE TRENCHES A, B, C, (CLEAN COAL) 20.97 FT.

BOREHOLE	ZONE THICKNESS FEET	CLEAN COAL YIELD	EFFECTIVE CLEAN COAL THICKNESS FEET
2	70.0	30.1%	21.07
3	70.0	31.9%	22.33
4	68.0	29.9%	20.33
		AVERAGE	21.24

4. Whilst coarse refuse could be disposed of in pit spoil areas, fine refuse (50/100 M x 0) would require a tailings pond, with associated problems.

5. Make-up water supply - unless local aquifers are found, it would be necessary to pump a considerable distance and height from Blakeburn Creek (assuming there is sufficient flow at minimum levels).

6. Power supplies - with a preparation plant it may not be possible to avoid bringing main line electrical power to the site.

7. Last and by no means least, a preparation plant implies additional capital investment and operating cost. A bare minimal plant would cost more than $1.5 MM and require 3 men per shift to operate.

RESERVES

A 5000 ft. length of strike is used to calculate clean coal reserves - this represents the outcrop from trench A to trench E. South of trench E, the favourable surface dip slope transforms to an adverse slope along the outcrop adjacent to mines 3, 4 & 5. The presence of a 500' fault between mines 3 & 4 plus several other faults, along with the adverse slope make this area not recommended for mining under the overall terms specified for this study.

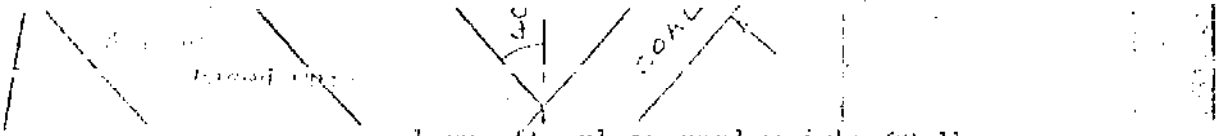
North of trench A there is no evidence that the coal zone continues as projected in earlier reports (but see summary). For these reasons, a strike length of 5000 ft. only is considered.

The geological evaluation by Vans Hulbert is enclosed in App. 1. Figures for proven reserves in the main body of the report below have been arrived at by a slightly different method. Hulbert uses an overall yield of 25.4% on the 70 foot coal zone, based on earlier evaluation reports and in particular 3 borehole samples. It can be said, however, that the technique used for drilling the boreholes was likely to give less than reliable coal quality information, and it is felt that the channel samples and sections taken recently suggest a yield of 63.5% based on selective mining of benches in the coal zone where clay and shale contamination is more evident (particularly north of the Lodestone road). Hulbert's report also includes the strike length south of trench E to Mullins Pit as part of the proven reserves. Whilst this is strictly correct in terms of tonnages in place, it is not considered that this more southerly area is suitable for open pit mining in the context of this study, as stated above.

Assuming an average surface dip slope of 10°, a coal zone dip of 40°, and an average overburden cut slope of 40°, (see fig. 2) table 3 has been drawn indicating clean coal reserves and mining ratios for 50 ft. increments of pit depth. The average effective clean coal thickness (26.23 ft.) is assumed to be 90 lbs./cu. ft.

TABLE 3

DEPTH OF PIT, FEET	CLEAN COAL RESERVES 1000's of Tons	STRIPPING RATIO OVERBURDEN CU. YDS. Per Ton Clean Coal
100	710.7	1.495
150	1,123.8	2.369
200	1,540	3.232
250	1,950.2	4.095
300	2,363.3	5.002
350	2,776.5	5.854



1 cu. ft. clean coal weighs 90 lbs.

Strike length 5000 ft.

Average mineable coal zone thickness 41.28 ft.

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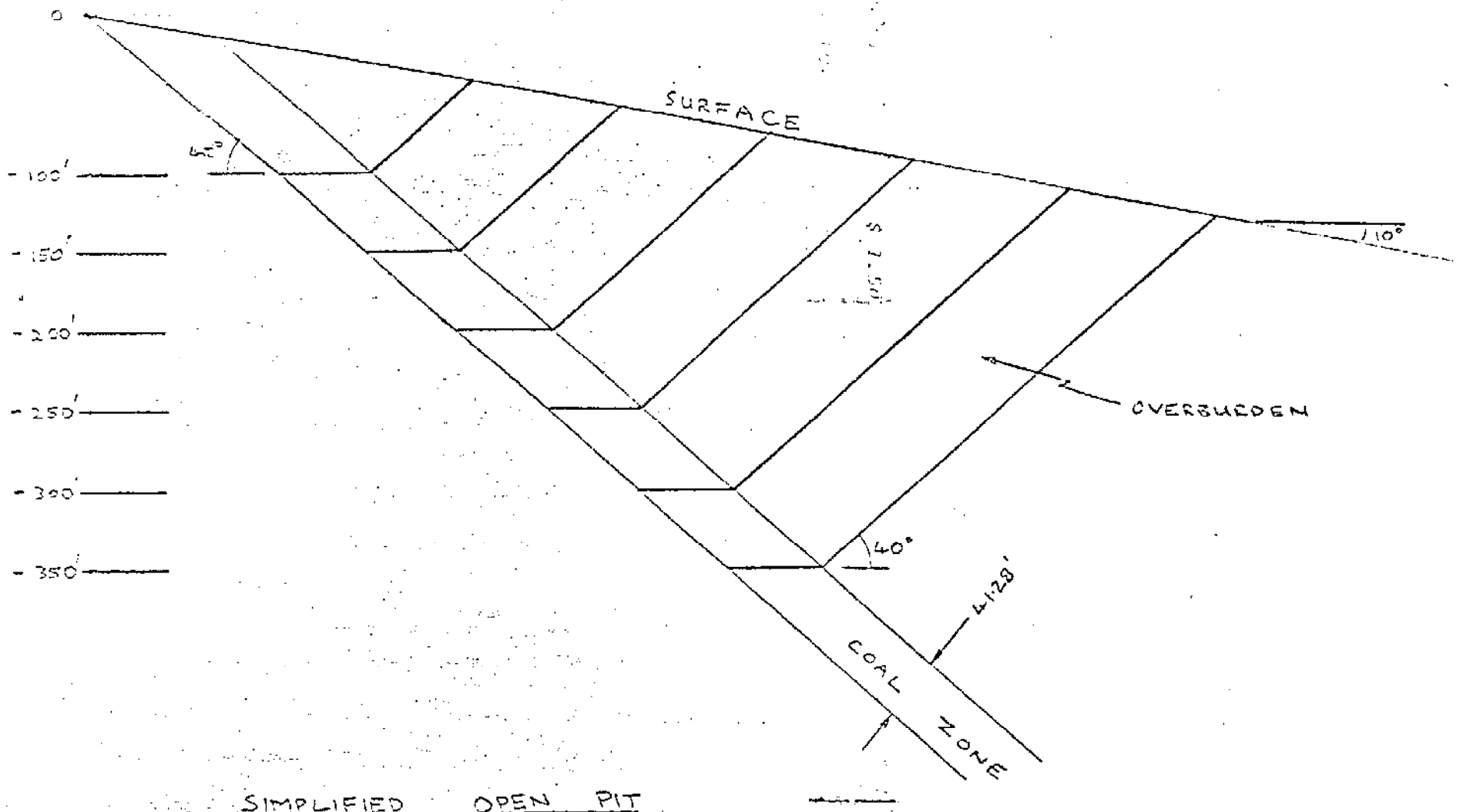

SIMPLIFIED OPEN PIT

SECTION

Fig. 5

PRODUCTION COSTS

Without going into any detail, approximate costs have been estimated as follows:

	Cost/clean ton
Mining	$ 5.00
Preparation	$ 1.30
Trucking & loading into rail cars	$ 1.50
Capital charges (while banks ($2.0 MM @ 15%)	$ 1.50
Freight costs	$ 7.00
	$16.30

the presented a is required to fully evaluate coal quality.

cost/MM B.T.U. 81.5¢

These figures are based on an overall production of 200,000 tons of 10,000 B.T.U./lb. clean coal. The life of the property would be approximately 10 years based on proven reserves. Capital charges include the cost of a preparation plant, and construction of a new road from the mine to Coalmont. Mining equipment, workshops and offices would be leased. Trucking from the plant to the rail car loading point would be contracted out.

CONCLUSIONS

A complete evaluation of the suggested open pit mining area of the Tulameen Coalfield has been thwarted by the lack of accurate basic data on coal quality and geology. It is clear, however that only a coal outcrop strike length of 5000 feet on the West side of the coalfield can be considered both proven and topographically suitable for open pit mining. Whether or not the outcrop continues to the North of this area is not proven, whilst coal reserves to the South are in an adverse surface slope situation. The quality of the coal in this 5000 ft. strike length leaves severe doubts on its suitability for upgrading to 10,000 BTU/lb. due to the presence of fireclay and shale bands, and more intensive sampling is required to fully evaluate coal quality. The uniformity of the coal zone in this area has not been fully determined but indications are that for the mining depths considered, a mean 40° dip of the coal zone can be assumed. However, this assumption should be verified by more borehole drilling in the area.

Clearly, therefore, any conclusions on clean coal reserves must be qualified by the above limitations in basic data. Calculations indicate reserves of clean coal in excess of 2 MM Tons, but at stripping ratios over 4 to 1. At a pit depth of 250 ft. and a ratio of 4.1 to 1, just less than 2 MM tons of reserves are projected (1.95 MM tons). A very approximate cost appraisal gives a figure of 81.5¢ per MMBTU for the coal delivered to the user plant.

We feel that there is too much doubt associated with the reserves calculations to warrant further appraisal at this stage. The areas of doubt should be clarified by further site exploration work, including: -

a) trenching along the outcrop to both fully verify the 5000 ft. strike length and determine if the outcrop extends to the North.

b) intensive channel sampling along the strike length, for thorough coal quality appraisal.

c) borehole drilling down dip to confirm geological interpretations.

On completion of an agreed program of exploration, it will be possible to make a valid evaluation of the property. Until such valuation, the property can only be considered as marginal.

APPENDIX 1

GEOLOGICAL APPRAISAL AND CLEAN COAL

RESERVES CALCULATION

INTRODUCTION

An attempt has been made to evaluate the proven recoverable reserves of coal in the proposed open pit area of the Tulameen Coal Field. This evaluation is based on personal observation and basic data presented in the report by Wright Engineers Ltd., dated December 1969.

A short discussion, based on a photo-geologic study is included in this presentation.

To allow comparison the calculations in this report have been presented in form similar to that in the Wright Engineers report.

COAL QUALITY

Qualitative data are presented in various parts of the Wright Engineers Ltd. (W.E.L.) report. W.E.L. have estimated the percentage of coal in the measures based on the B.T.U. content of 4 drill hole samples. However, the upper bench of the seam in hole #5 was apparently lost so the analytical data of the lower benches cannot be considered as representative of the total seam. Therefore the values obtained from holes 2, 3 and 4, only are used in the following calculation to arrive at an average quality for the seventy foot section.

Hole	%Sink	B.T.U./Lb.	Units	%Float	B.T.U./Lb.	Units	Total Units
2	69.9	6,065	4,239	30.1	10,232	3,079	7,318
3	68.1	4,999	3,404	31.9	9,822	3,133	6,537
4	70.1	5,294	3,711	29.9	10,257	3,066	6,777
Total	208.1		11,354	91.9		9,278	20,632
Average	69.4	5,450	3,780	30.6	10,100	3,090	6,870

Referring to the bottom line in the above table it can be seen that 69.4% of the raw feed is lost in washing and 30.6% is recovered in the float. The calorific values of the two gravity fractions are 5450 and 10,100 B.T.U./lb. respectively.

SUMMARY & CONCLUSIONS

Quality

Based on analyses of three drill sections the yield of clean 10,100 B.T.U. coal is estimated at 25.4%.

Reserves

The recoverable reserves have been downgraded on this basis and classified according to the mining situation as presented in the following table.

Area	Surface Mining Depth	150 ft.	250 ft.
		Reserves - Thousand of tons	
#5 Mine - Trench B	Dip slope to open	937	1,569
#3 Mine - #5 Mine	Adverse slope	1,875	3,137
Total		2,812	4,706

Stripping Ratios - North Block

The stripping ratios for the area between the lodestone road and trench B are 2.60 and 4.49 cubic yards overburden per ton of clean coal for the 150 and 250 feet mining depths respectively.

Additional Reserves

Additional reserves of open pit coal may be found to the west of the #5 Mine - Trench B area and along outcrop to the Fraser and Collins Gulch areas.

RESERVES

A. Proven

The yield calculated above is a theoretical value. It is doubtful if anything better than 83% of the performance would be achieved in a gravity separation plant. (This figure was used by W.E.L.). On that basis only 0.83 x 30.6 = 25.4% of the run of mine coal in the seventy foot section would be recoverable. Therefore recoverable proven reserves should be reduced to 25.4/60 x 6,643,000 - 2,812,000 tons on washing yield alone.

B. Probable Reserves - Collins Gulch to Fraser Gulch

There is insufficient geological data available at this time to even suggest that open pit reserves are available in this area. It would, however, be reasonable to consider this area for further exploration.

C. Reserves classified as to mining conditions

Mining Depth - 150 ft.

The mining section shown in the W.E.L. report is typical of the area between Trenches B and E but is not representative of the area along the outcrop of the old underground workings. The divergence of the hanging wall and surface is quite similar in both cases due to the steeper inclination of the seam in the dip slope area. However, the required average slope on the open pit outwall will necessitate a higher stripping ratio for equivalent reserves in the old workings area. This may be compensated for by the thicker coal apparent in the Rolling pit

and conversely, depending on the depth of open pit mining, by previous partial extraction of the reserves in the old underground workings. In any event the "proven" reserves contained within the dip slope situation exist over a strike length of only five thousand feet. It is therefore considered that only 5000/15000 x 2,812,000 = 937,000 tons of "proven" recoverable reserves are known to exist in the optimum dip slope situation within an average depth of one hundred and fifty feet.

The remaining (2,812,000 - 937,000) =1,875,000 tons of recoverable clean coal reserves are contained between No. 5 and No. 3 mines under topographic condition not so amenable to open pit mining.

Mining depth - 250 ft.

With a mining depth of 250 ft., a strike length of 5000 ft., an average coal zone thickness of seventy feet and a washing yield of 25.4%, the estimated recoverable reserves in the area between trench B and No. 5 mine are estimated at $\frac{390 \times 5000 \times 70 \times 0.254 \times 62.4 \times 1.45}{2000}$

= 1,569,000 tons

The total recoverable reserves between #3 Mine and Trench B are

$\frac{390 \times 15,000 \times 70 \times 0.254 \times 62.4 \times 1.45}{2000}$

= 4,706,000 tons

METHOD

Linear sections were measured by the writer in Trenches B and C and, barring serious structural complexities, should be representative of the area in question. The aggregate coal and total thickness for each bench in the zone are shown on the following table.

	Trench B		Trench C	
	Coal (in).	Total (in)	Coal (in).	Total (in)
Upper Bench	23	95	73	198
Middle bench	158	244	159	215
Lower Bench	205	413	157	190
Total	386	752	389	603

The upper bench in trench B contains 23 inches of coal and 29 inches of soft bentonitic clay in a 95 inch section. Trench C contains 73 inches of dirty coal and 125 inches of bentonitic clay in the 198 inch section.

Due to the obviously poor yield and clay contamination of this bench, it would probably be mined as overburden and thus would not contribute to the recoverable reserves.

As this bench was obviously included in the drill hole samples and hence influences the washability data, it has been included in the mining section for the purpose of the following exercise. However, the

mining section has been reduced to an average zone thickness (56.5 ft.). 17.2
The ratio of 56.5/70 has then been applied to the coal bed volumes in the W.E.L. report to arrive at the recoverable raw coal volumes in the following table. W.E.L.'s overburden volumes have been used in the computation.

In order to calculate the recoverable coal by weight it has been necessary to use W.E.L.'s specific gravities for the components making up the raw coal section.

Assuming an average coal content of 57.2% by volume:

Coal content/c.y. = 0.572 x 27 x 62.4 x 1.45

= 1400 lbs.

Shale content /c.y. = 0.428 x 27 x 62.4 x 2.70

= 1950 lbs.

One c.y. raw coal weighs 3350 lbs.

And one bank yard contains (does not yield) 1400 lbs of coal or

0.70 tons of coal

Washing yield = $\frac{25.4 \times 3350}{2000 \times 100}$ = 0.425 tons/c.y.

Required excavation of raw coal = 1080/0.425

= 2541 c.y.

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Depth	Coal Bed Cu. Yds./ft.	Cum.	Stripping Cu. Yds./ft.	Cum.	Coal Yield Tons/ft.	Ratio c.y. O.B./Ton clean coal
50	197		74			
		197		74	84	0.88
100	165		204			
		362		278	154	1.81
150	165		304			
		527		582	224	2.60
200	165		478			
		692		1060	294	3.61
250	165		575			
		857		1635	364	4.49

The ratio of overburden to clean recoverable coal is 4.49 cubic yards per ton for a mining depth of 250 feet.

The average daily excavation required to maintain clean coal production at 1080 tons is 2541 + 4.49 x 1080 = 7390 c.y.

GEOLOGY

The following discussion is based on personal observation and study of previous reports and aerial photographs.

The material presented in previous reports is not duplicated herein.

The structure in the Collins-Fraser Gulch area appears to be quite complex with near vertical to overturned strata being suggested near Fraser Gulch.

Ground traversing and trenching combined with photo study could resolve some of the structure in these areas.

Stratigraphy and Structure

The main coal zone at outcrop with an aggegate thickness of 180 feet (Fahunis section) in Mullins pit deteriorates to a thickness of 63 feet in trench B. A more rapid deterioration is seen between trenches B and A where the net coal thickness decreases from 30 to 12 feet. While depositional continuity does not appear to be one of the attributes of this coal zone, it is believed that these major variances are largely the result of tectonic influences.

It is quite likely that neither of the two extremes in thickness are typical of the zone.

Thrust faulting has probably caused repetition of the zone in the Mullins pit whereas in trench A only the mineable and upper bench are brought to the surface on a thrust fault. If true the normal thickness could be expected down dip on the upper plate in both instances.

Depending on the presence of further structural disturbance to the west of trench A, the lower plate coal zone may outcrop in this area.

Aerial Photo Study

On the west flank of the syncline, the apparent interval between the main coal zone and the base of the sediments appears to be considerably thicker than that described by Phaw. This may be accounted for by a postulated anticlinal fold, the axis of which parallels the seam outcrop some 900 feet southwest of trench C.

The structure in the Collins-Fraser Gulch area appears to be quite complex with near vertical to overturned strata being suggested near Fraser Gulch.

Ground traversing and trenching combined with photo study could resolve some of the structure in these areas.

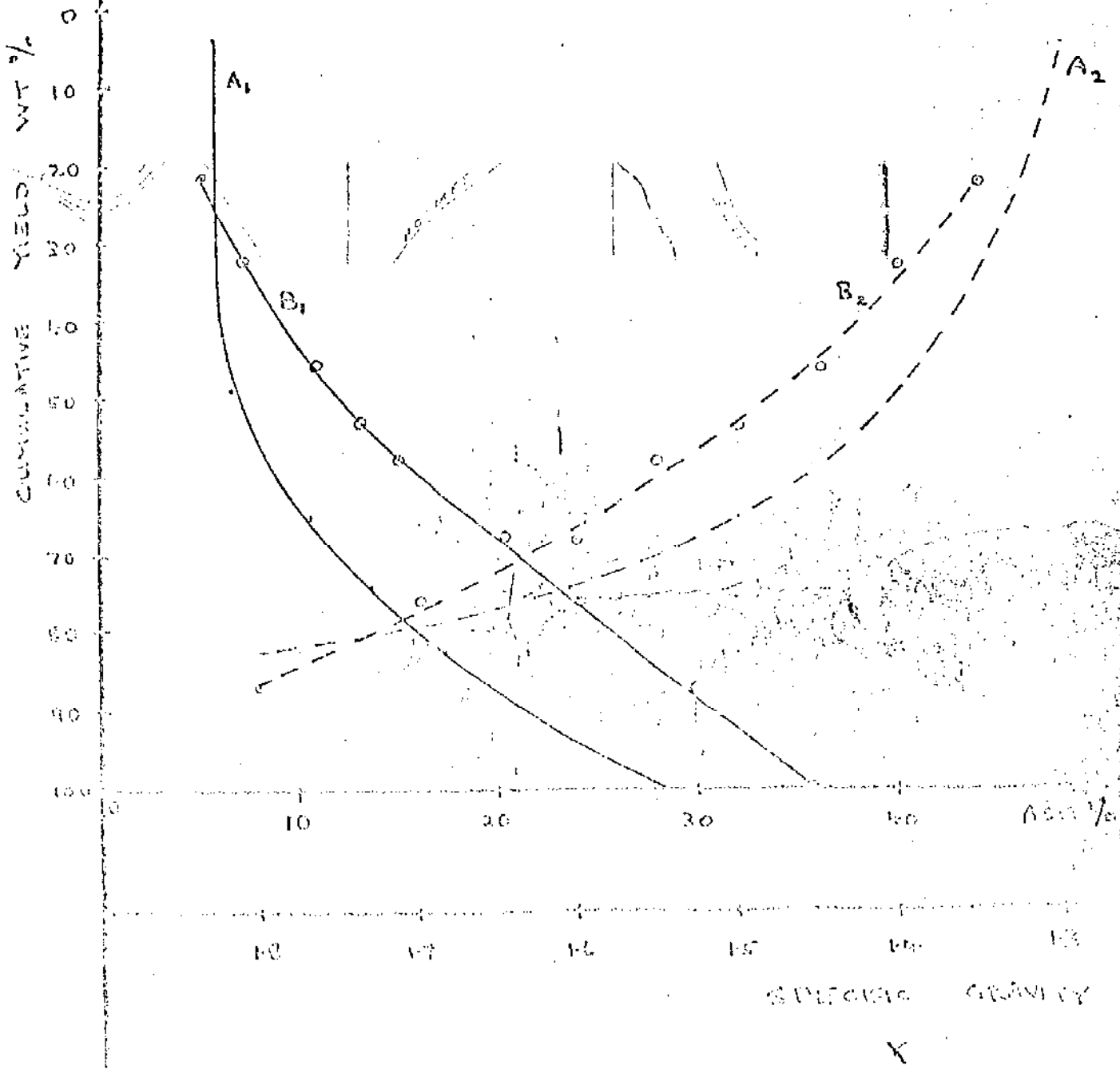
TRENCH A. - CHANNEL SAMPLE FROM 12 FT. THICK MINEABLE ZONE IMMEDIATELY ABOVE FOOTWALL.

PROXIMATE ANALYSIS, RAW COAL, ½" x 0

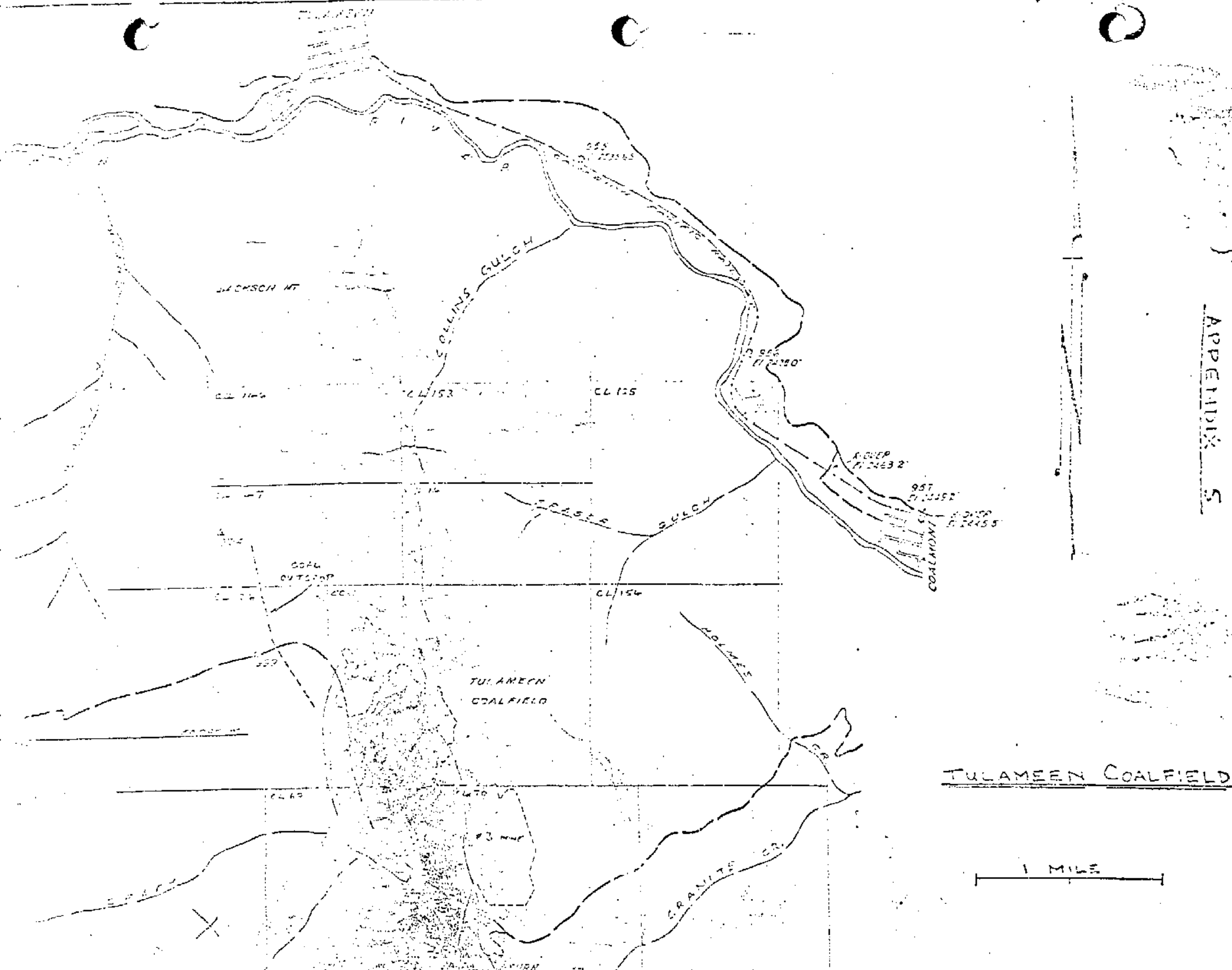
	As Received	Dry Basis
Moisture %	12.9	
Ash %	26.2	30.1
Volatile Matter %	26.2	30.1
Fixed Carbon %	34.7	39.8
Sulphur %	0.34	0.39
C.V., B.T.U./lb.	7930	9105

WASHABILITY CURVES

	TRENCH A	TRENCH B
YIELD – ASH	A_1	B_1
YIELD – S.G	A_2	B_2



APPENDIX 5


COLLINS GULCH
JACKSON MT
CL 153
CL 155
CL 154
FRASER GULCH
COAL OUTCROP
HOLMES
TULAMEEN COALFIELD
#3 MINE
GRANITE CR.
COALMONT
TULAMEEN COALFIELD
1 MILE

TRENCH B - CHANNEL SAMPLE FROM 22 FT. THICK MINEABLE ZONE (MIDDLE BENCH)

PROXIMATE ANALYSIS RAW COAL

	As Received	Dry Basis
Moisture %	16.46	
Ash%	26.48	31.7%
Volatile Matter%	27.11	32.45%
Fixed Carbon %	29.95	35.85%
Sulphur %	0.45	0.54
C.V., B.T.U./lb.	7544	9031

TULAMEEN COALFIELD

COAL LICENSES

REGISTERED

OWNER	LICENSE NO.
IMPERIAL METALS & POWER LTD.	CL 154, 145, 146,14
MULLINS STRIP MINES LTD.	CL 69,70,71,126,125
T. G. STOUT	CL 153

APPENDIX

Extracts from Geological Survey of Canada.

Memoir 52-19 by Shaw, Dated 1952.

"...Two large fault zones and many small faults are known to intersect the coal beds in the South limb of the basin....

....All faults noted strike either normal or at a high angle to the strike of the strata....

....#3 and 4 mines were seperated by a fault of approx. 900 ft....

....Several small faults occurred in #4 mine....

....Mined coal quality:-

Ash	4 to 16%
Moisture	2 to 5%
Sulphur	approx. 0.3%
B.T.U.	11,800

....#3 Mine:- Main seam 7'6" to 12'0" thick, overlain by 9 to 14 ft. dirty coal with up to 12" of fireclay immediately overlying
ft. of dirty coal, clay and shale were underlying the main seam.

....#4 Mine:- Main seam 12 ft. thick with a 7 ft. seam underlying.
of fireclay overlying the main seam.

....#5 Mine:- An area of dirty coal to the West was found.

SM-Tulameen 74 (4)A

CONFIDENTIAL COAL ANALYSIS

GEOLOGICAL BRANCH
ASSESSMENT REPORT

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(2)

TRENCH B - CHANNEL SAMPLE FROM 22 FT. THICK MINEABLE ZONE (MIDDLE BENCH)

PROXIMATE ANALYSIS RAW COAL

	As Received	Dry Basis
Moisture %	16.46	
Ash%	26.48	31.7%
Volatile Matter%	27.11	32.45%
Fixed Carbon %	29.95	35.85%
Sulphur %	0.45	0.54
C.V., B.T.U./lb.	7544	9031

SINK - FLOAT ANALYSES (Dry Basis)

Specific Gravity	Weight %	Ash %	B.T.U./lb.	Cumulative Weight %	Cumulative Ash %	Cumulative B.T.U./lb
1.35 Float	21.2	5.09	12756	21.2	5.09	12756
1.35 x 1.4	10.9	10.95	11633	32.1	7.06	[illegible]
1.4 x 1.45	13.7	19.88	10545	[illegible]	[illegible]	[illegible]
1.45 x 1.5	7.3	26.75	9573	53.1	[illegible]	[illegible]
1.5 x 1.55	5.0	33.94	8519	58.1	[illegible]	[illegible]
1.55 x 1.6	9.4	52.87	5738	67.5	[illegible]	[illegible]
1.6 x 1.7	8.4	55.66	5306	75.9	24.1	9945
1.7 x 1.8	11.2	68.97	3507	87.1	29.87	9117
1.8 Sink	11.0	73.55	2227	100	35.52	8230

APPENDIX 4

TRENCH A - CHANNEL SAMPLE FROM 12 FT. THICK MINEABLE ZONE IMMEDIATELY ABOVE FOOTWALL.

PROXIMATE ANALYSIS, RAW COAL ½" x 0

	As Received	Dry Basis
Moisture %	12.9	
Ash %	26.2	30.1
Volatile Matter %	26.2	30.1
Fixed Carbon %	34.7	39.8
Sulphur %	0.34	0.39
C.V., B.T.U./lb.	7930	9105

SINK - FLOAT ANALYSES ½" x 28 M (Dry Basis)

Specific Gravity	Weight %	Ash %	Cumulative Weight %	Cumulative Ash %
1.3 Float	3.8	5.8	3.8	5.8
1.3 x 1.4	45.3	6.8	49.1	6.7
1.4 x 1.5	16.0	22.5	65.1	10.6
1.5 x 1.6	8.9	35.3	74.0	13.6
1.6 x 1.7	5.1	47.0	79.1	15.7
1.7 x 1.8	3.3	55.0	82.4	17.3
1.8 Sink	17.6	80.0	100	28.3

FLOATS @ 1.6 S.G. DRY BASIS ANALYSIS

Ash %	13.4
V.M. %	33.7
F.C. %	52.9
Sulphur %	0.5
C.V., B.T.U./lb.	10610