

General & Development

PR-QUINTETTE 74(01A)

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1975

# CONFIDENTIAL **OPEN FILE**

**QUINTETTE COAL LIMITED**

**INFORMATION SUMMARY**

**MAY 1975**

604

## QUINETTE COAL LIMITED

### Information Summary

This brief report introduces Quintette Coal Limited and its developing Quintette Project, located about 100 miles southwest of Dawson Creek, B.C. Quintette Coal Limited is a British Columbia company whose shareholders are Denison Mines Limited, Alco Standard Corporation, Mitsui Mining Co., Ltd. and Tokyo Boeki Ltd.

38%

37%

12 1/2%

17 1/2%

Exploration and development work has been in progress on the Quintette licence area for over four years and expenditures to date total more than \$4,000,000. Sufficient proven and probable reserves have now been established to clearly indicate that the entire project area is capable of producing 5 million tons of coal per year over a 20 year period. These basic reserves include an ample back-up reserve in case mining problems are encountered or expansion is required to meet increased domestic requirements.

Quintette Coal Limited has now decided to test the economic viability of these metallurgical coal resources through a detailed feasibility study of an underground hydraulic mining operation with open pit support.

Denison Mines (B.C.) Limited has been named by the Quintette shareholders to manage the program and has retained Kilborn Engineering Limited of Vancouver as the primary consultant with responsibility for co-ordinating the engineering and technical consultants, including Mitsui Mining Co., Ltd. who will supply the feasibility data on hydraulic mining.

In addition to the investigation of mining techniques and coal preparation, the feasibility study will include a complete evaluation of all aspects of the related infrastructure from rail loading to port, labour availability, worker accommodation, power, and, most importantly, environmental and social impact studies. In this regard, B.C. Research has already been engaged to analyze the potential environmental effect of the project.

*Terms of Ref  
a outline of  
their study?*

The present study will be completed by November, 1975 and, if it is favourable, the final full-scale feasibility study including detailed engineering studies and plant design will commence late this year and be completed by November, 1976. Construction of the mine and related facilities is expected to take 3 years, during which time sufficient mine development work will have been completed to allow the mine to commence production in late 1979 and build up production to 4.5 million tons per year in carefully planned increments as shown on the chart on the following page.

There is a strong demand for high-grade coking coal on the world market, and, although the initial overtures will be made in the traditional Japanese market, the Canadian market is also being vigorously investigated and all other sales opportunities will be seriously pursued.

In addition to the coal resources in this area, there are well known forest, gas, and recreational resources, the development of which will be facilitated by the initial provision of access to the area. The potential for each of these to expand and contribute to the multi-dimensional resource base of the regional and provincial economy will form an essential part of the feasibility study.



YUKON  
 NORTHWEST TERRITORIES  
 BRITISH COLUMBIA  
 ALBERTA

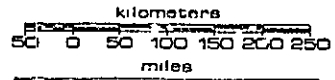
PACIFIC OCEAN

PACIFIC OCEAN

UNITED STATES OF AMERICA

**LEGEND**

- PROVINCIAL BOUNDARY
- INTERNATIONAL BOUNDARY
- GEOGRAPHICAL LOCATIONS
- ◻ CAPITAL CITIES
- RAILWAY LINES
- MILEAGES BETWEEN POINTS



DENISON MINES (B.C.) LIMITED  
 CA. GARY ALBERTA

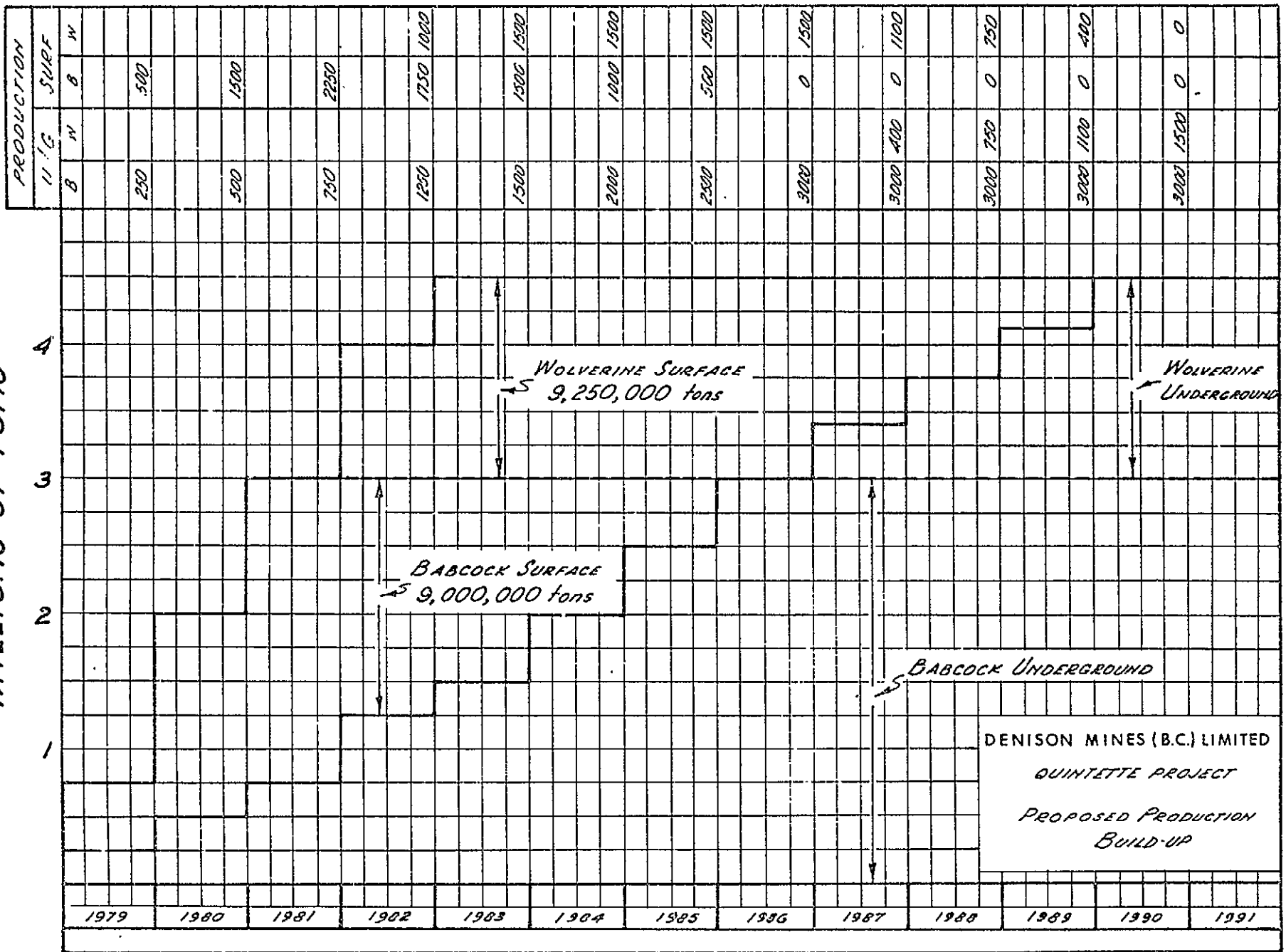
Location Map  
**QUINTETTE**  
 COAL LIMITED

## DEVELOPMENT SCHEDULE

Present planning is aimed toward commencement of production from the new mine in mid 1979. To achieve this objective, the following interim dates must be met.

- Complete preliminary feasibility study - November 1975
- Complete final feasibility study - November 1976
- Commence mine construction - November 1976
- Commence town construction - November 1976
- Commence rail spur construction - November 1976
- Commence port development - November 1976
- Commence power line construction - November 1976
- Commence underground development - mid 1978
- Commence shipment of product - Fall 1979

MILLIONS OF TONS



## RESERVES

One of the real advantages that the Quintette project may have over other similar new coal ventures is that, in addition to the large primary reserves in the structurally attractive Babcock area, the coal licences extend over a variety of other geological structures with more limited, but significant potential for the development of mineable coal reserves. This fortunate circumstance presents the company with a number of development options. It assures that mining need not be restricted to one setting if trouble arises and that there will be ample opportunity to expand the operation while still maintaining substantial reserves to satisfy a growing domestic demand.

Over the past four years a considerable amount of geological mapping, diamond drilling, adit driveage, bulk sampling, trenching, and coke evaluation has been completed on or for the Quintette licences. This work has proven the presence of over 500 million tons of very good quality coking coal in place within the geological formations in the Babcock area of the property. In addition to this, concurrent exploration in other areas of the property has located over 200 million tons of less accurately defined coal in place and efforts are continuing to extend and determine the mineable portion of these reserves. While this is a very large amount of coal, it must be borne in mind that mining and cleaning losses, geological uncertainty, and the limitations of mine access, significantly reduce the amount of coal available as clean, delivered product. Nevertheless, even taking these factors into consideration the reserves in the Quintette licence area are sufficient to support production of 5 million tons per year for more than 20 years.

### Quality

The Babcock coal is present in four main coal seams and, as a result, has a range of quality. The coal from all of these seams is a medium volatile bituminous coal with very good coking characteristics. On the basis of present mining plans, the average coal product from the property is expected to have the following analysis:

Ash	7.5%
Total Moisture	6.0%
Volatile Matter	21.2-23.2%
Fixed Carbon	63.2-66.2%
Sulphur	0.31-0.51%
Free Swelling Index	6 $\frac{1}{2}$ -7 $\frac{1}{2}$

The coking characteristics of bulk samples of the coal have been extensively tested both at the Department of Energy, Mines and Resources facility in Ottawa and by various steel mills in Japan. The results have been consistently good, indicating that the Babcock coal will be as good or better than any now produced in Canada.



## MINING

Emphasis is being placed on hydraulic mining as the primary method of coal extraction on the Babcock portion of the Quintette Project. Reserves of open pit coal will also be delineated to provide readily available coal in the early stages of production and to allow the mine and preparation plant to reach their rated capacities as soon as possible. Some open pit coal will also allow for a more rational development of the underground labour force for the hydraulic mines which will produce most of the coal. The hydraulic system of mining coal has been in use for over 100 years. In the last 20 years it has been perfected in Britain, Germany, Japan and Russia. The most recent successful installation has been in British Columbia where production has exceeded the most optimistic predictions.

The sketch on the following page shows the essential differences between a normal, flat seam mining operation using continuous miners and a mining section in a steep seam equipped for mining with the hydraulic monitor.

The hydraulic system is particularly suitable in the steeper, thicker seams of coal so common in the Rocky Mountain Foothills. The method used consists of driving roadways in the coal near the bottom of the coal seam and then using a hydraulic monitor to cut out the coal above. The mined coal and water is crushed in a feeder-breaker and then allowed to flow to a collecting point either inside or outside the mine. Normally only two men are used on the monitor, with additional support personnel well back from the mining face.

ROOF BOLTS

VENTILATION OR EXHAUST DUCT

ROTATING CUTTER

COAL

SHUTTLE CAR TO TRANSPORT COAL TO CONVEYOR.

ELECTRIC 500 HP CONTINUOUS MINER

ALL MACHINERY MOVES TO ANOTHER WORKING AREA AFTER CUTTING TWENTY FEET, SO BOLTING MACHINE CAN MOVE IN, DRILL ABOUT TWENTY-FIVE HOLES AND INSERT ROOF BOLTS.

# CONVENTIONAL MINING

COAL

WATER JET

STEEL ARCHES WITH WOODEN LAGGING

MONITOR CONTROLLED BY OPERATOR

BREAKER-FEEDER PICKS UP COAL SIZES IT, AND FEEDS IT INTO FLUME WITH WATER.

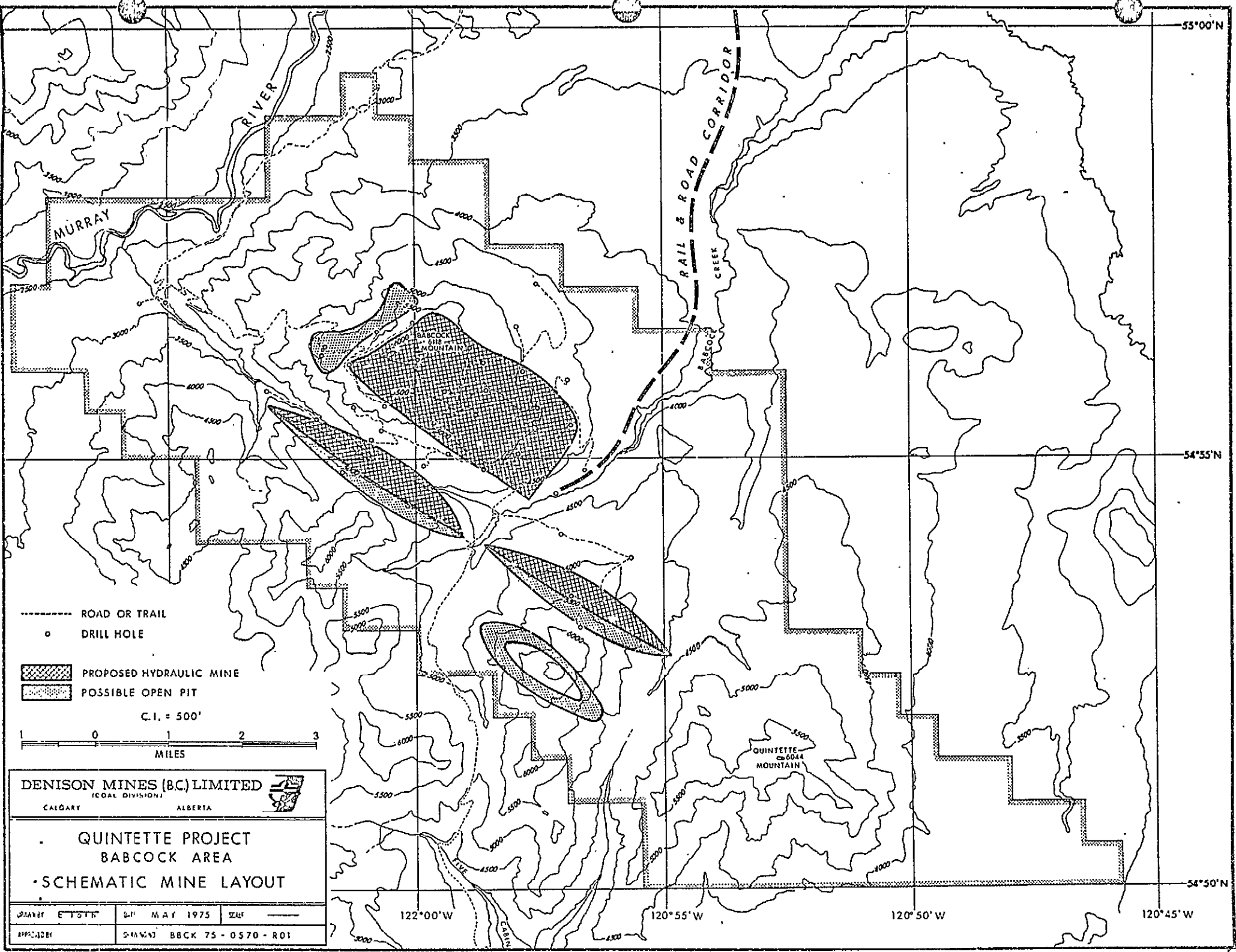
OPERATOR IN BOOTH 40 FEET FROM MONITOR, WITH HYDRAULIC & ELECTRIC CONTROLS.

# HYDRAULIC MINING

Another main advantage of the hydraulic system is that it removes more coal from a seam than conventional mining techniques. For example, where only 20 per cent of a 40 foot seam might be removed conventionally, 50 to 70 per cent will normally be extracted hydraulically. The reduction in development cost and the improvement in coal conservation is obvious.

The safety aspect of the system is also improved because most roadways are supported by steel arches; the monitor is swung by hydraulic cylinders (controlled from a manned station, under steel and well away from the mining area); dust is suppressed by the large amounts of water used; the explosion hazard is reduced since no sparks are produced by metal cutter picks breaking the coal; and, a large quantity of coal comes from one place, allowing the ventilation to be concentrated there.

Although hydraulic mining may be considered a new technique in some mining districts, and, as with all mining systems, it will require modification and adjustments before it works effectively in any given situation, there is now ample evidence that this method will have a very marked effect on the economics of coal mining in the Rocky Mountain Foothills. There is no doubt that the Quintette Project, and particularly the proposed Babcock mining area, with individual coal seams ranging up to 20 or more feet in thickness, has an excellent prospect of being developed with this mining technique.



55°00'N

54°55'N

54°50'N

122°00'W

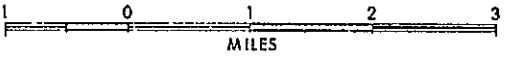
120°55'W

120°50'W

120°45'W

- ROAD OR TRAIL
- o DRILL HOLE
- [Cross-hatch pattern] PROPOSED HYDRAULIC MINE
- [Dotted pattern] POSSIBLE OPEN PIT

C.I. = 500'



**DENISON MINES (B.C.) LIMITED**  
 (COAL DIVISION)  
 CALGARY ALBERTA



**QUINTETTE PROJECT  
 BABCOCK AREA  
 SCHEMATIC MINE LAYOUT**

ISSUED BY	DATE	SCALE
APP'D BY	DRAWN BY	PROJECT NO.
	BBCK 75 - 0570 - R01	

## ENVIRONMENTAL IMPACT

The desirability of minimizing the detrimental environmental effects of the project is recognized and accepted. The first step in achieving this objective is to establish, through a base line survey, the environmental assets present in the affected area. Once the nature of these assets has been identified their degree of vulnerability to the proposed project can be established, and specific plans made for measures which will minimize any undesirable effects. This study has already been commissioned.

*To who?  
author?*

The environmental studies must recognize not only the direct effect of the project itself on the local environment, but also the indirect effect such as that caused by the impact of additional people who will visit the area simply because of improved access. The secondary effect at the port location, the supply centre of Dawson Creek, the new railroad spur, and the transmission line must also be assessed.

There is no doubt that there is an environmental cost of developing such a project. However, by intelligent management and control this cost can be kept to a minimum and will be insignificant in relation to the overall benefit inherent in the project.

## ECONOMIC IMPACT

*6/18/11 M. NEL*

The feasibility study will include extensive investigation of the economic impact of the project on the local region, and on the province as a whole. It is expected that at the 3,000,000 ton per year production level the project will employ directly approximately 800 men. The total annual payroll for this force will be in the order of \$15 million. As production increase to 4.5 million tons per year, in excess of 1,000 employees will certainly be required.

In addition to this direct employment on the site, there will be employment in the direct and indirect service industries necessary to support the project, such as the coal rail haul, port handling, supply of material and equipment, etc. to the project, stores, schools, shops, etc. Direct payroll in these industries together with the multiplier effect will have a major positive impact on the economy, and the feasibility study will include a detailed quantitative assessment of this impact.

## LABOUR

It is anticipated that problems related to labour will be critical to the project. Major developments now planned for British Columbia and Alberta will create strong demands for all types of labour and will have a serious effect on labour availability. In addition, the remote location of the project will render it less desirable than some of the other projects now being planned.

Contacts have already been developed with local municipal leaders, the B.C. Department of Labour, and Canada Manpower. These contacts will be maintained and further expanded. A comprehensive training program will be developed, aimed at making the maximum possible utilization of local labour. All other potential labour sources will be investigated and utilized to the optimum extent.

## INFRASTRUCTURE

Because of the remote location of the property, a substantial infrastructure will be required to support the development.

(1) Railroad

A rail spur will be required to connect the project with the existing main line of either the CNR or the B.C. Railway. A spur to connect with the B.C.R. at Chetwynd appears to be the most suitable, and this line, if finally selected, would have a length of approximately 75 miles. Some upgrading of existing track will also be required to accommodate the unit train movements.

(2) Port

New port facilities will be required to handle the production from the Quintette development. Prince Rupert and Britannia are both possible sites. The feasibility report will include a comparison of the relative merits of each of these sites, and others that may become apparent during the study.

*(number 3)  
what alternatives*

(3) Town

The supply centre for the project during construction and the initial years of production will be Dawson Creek. However, the remote location of the site and the long term duration of the project dictate that a new town must be built within a reasonable distance of the project.

*miles?  
where?*



The probability that other resource industries will develop when access is provided to the area is a factor which must be taken into consideration when planning the location and capacity of the town. The major coal reserves in the area indicate a probable life expectancy of the industry in that area in excess of 100 years.

*Housing costs -  
≈ 30,000 per unit  
Σ. K&S financing  
what commitment  
will you provide?*

(4) Roads

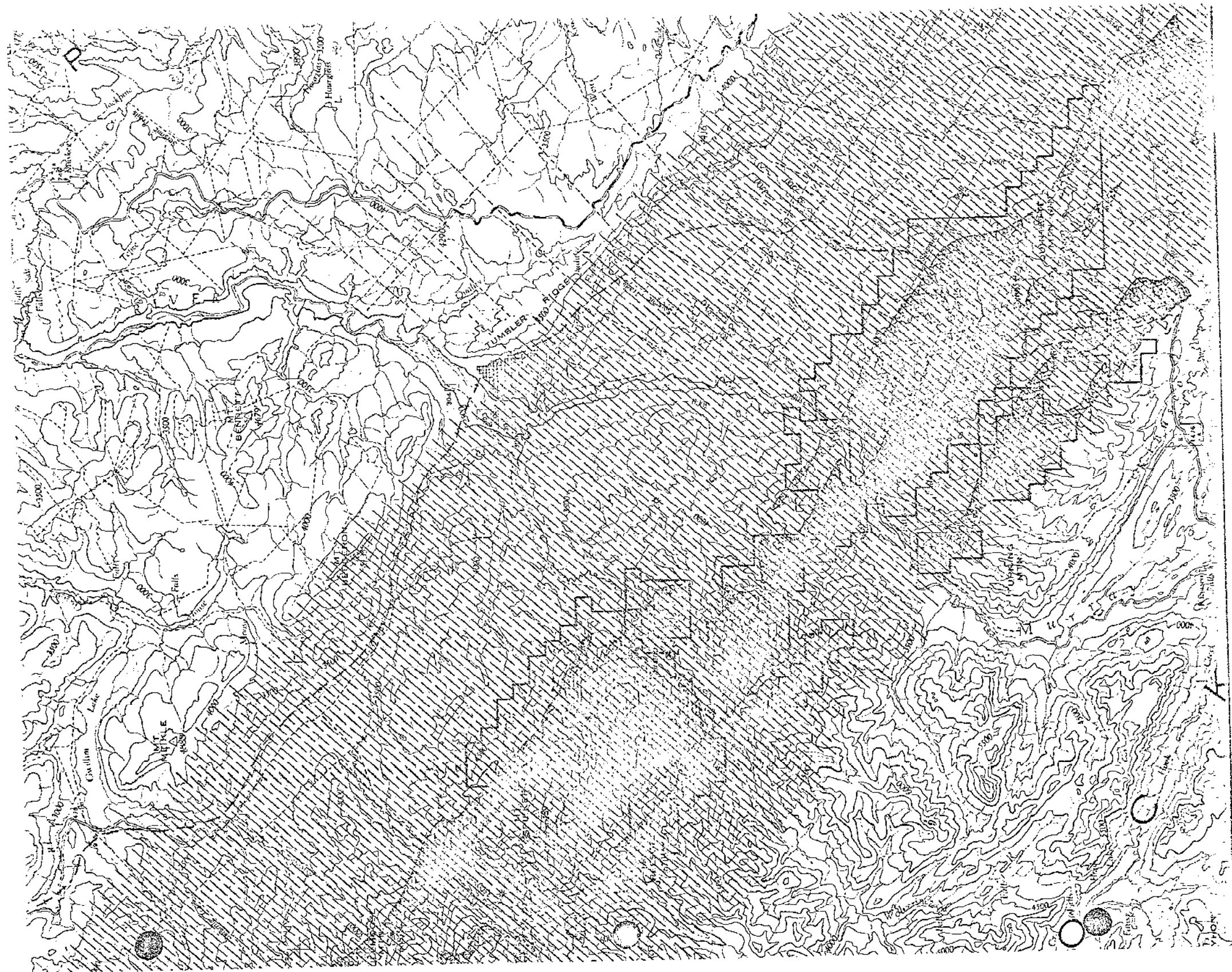
Existing industrial roads at present provide good-weather access to points near the site. To link the property directly with Dawson Creek approximately twenty miles of new road needs to be built to connect two of these roads and to build an extension to the property. The entire route needs to be upgraded to all-weather standards. In addition a major crossing on the Murray River will almost certainly be required to provide access to Chetwynd, Prince George, and points west.

(5) Power

A transmission system linking the project to the B.C. Hydro grid at Chetwynd will be required. Consideration will also be given to the construction of an on-site thermal generating station utilizing waste coal from the mine. Such a plant could be used to supply mine power and excess power if any could be sold to B.C. Hydro.

(6) General

During the planning of all elements of the infrastructure consideration must be given to existing and potential plans for other industrial development in the area, in order to ensure that facilities are adequately sized, and that maximum use is made of possible common facilities.



## RESOURCE POTENTIAL

The area near and within the Quintette Coal field, which extends for some 50 miles both north and south of the Quintette property, is endowed with a variety of natural resources which will undoubtedly contribute to the area's economic base and, in particular, will enhance the viability of the new community that must eventually be developed to service the coal field.

### Petroleum and Gas

The Grizzly Valley gas field and its extensions have supported one of the most active exploration plays in northeastern British Columbia in recent years. While it is reliably reported that significant reserves of both sweet and sour gas have been discovered, exact estimates of the potential are not yet public knowledge. However there are good indications that this area will be a substantial gas producer in the near future. The area being explored for oil and gas (shown in pink on the map following) is almost coincident with the coal field, although most discoveries have been just east of it and therefore closer to the proposed town site.

### Sulphur

The sour gas discoveries will require at least one, and possibly more, sulphur extraction plants. The production of sulphur would provide additional traffic for the British Columbia Railway and would make a small but significant contribution to the local population.

### Timber

The logging industry is already removing timber from areas within the Quintette licences in the Wolverine River Valley and less than five miles from the proposed town site. There is no question that these operations are viable and that they would be improved significantly if the logs did not have to be trucked 60 to 80 miles to a mill.

### Recreation

The Monkman Park proposal covering the Monkman Pass and Kinuseo Falls area has received universal support from local governments and businesses. Quintette Coal Limited and its shareholder companies encourage the government of British Columbia to establish a first class provincial park in this area. The only proviso we would add is that allowance be made for a transportation and utilities corridor along this historical route. The Monkman Park would be a valuable addition to the multi-dimensional resource base of the Quintette region's economy.

## GOVERNMENT RELATIONS

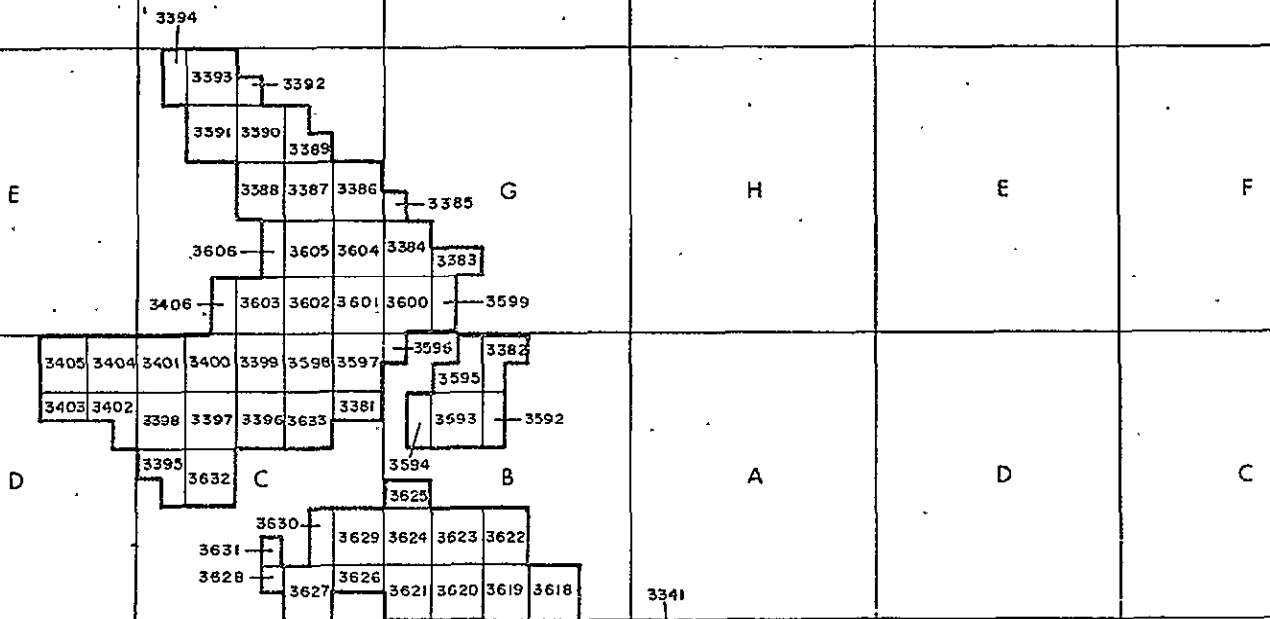
The need for continuous dialogue with all concerned government departments is recognized and it will be the objective of Quintette Coal Limited to keep the various government departments fully advised at all stages of planning and development.

The desire of the government to scrutinize various aspects and the probable effect of the project is also recognized. It is Quintette's desire to work closely with the government, particularly during the early stages, in order to obtain input which will ensure that all studies consider those areas of governmental concern in such a way as to ensure that the results are in a form most useful to the various departments involved.

15'  
93-P-3

93-P-2

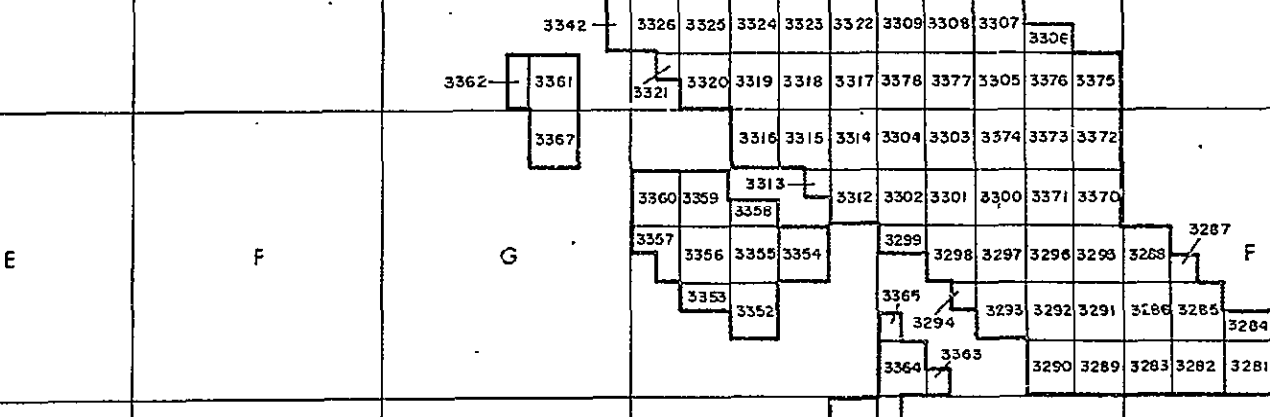
L K J I L K



55°00'  
93-1-14

93-1-15

L K J L K




54°45'

121°00'

D C B A D C

**DENISON MINES LIMITED**  
(COAL DIVISION)  
 CALGARY ALBERTA



**QUINTETTE  
 COAL LICENSES**

DRAWN BY: E. TOFH	DATE: Apr. '75	SCALE: 1:250,000
APPROVED BY:	DRAWING NO: QNTT 75 - 0563 - 201	

121°30'