PR-QUINTETTE 84(1)A

GEOLOGICAL BRANCH
ASSESSMENT REPORT

00 618

1984 QUINTETTE GEOLOGICAL REPORT

Submitted on April 15, 1985
Report by D. Johnson, Geologist

For work performed on Coal Licence numbers:
3325
3326
3339
3346
3360
3362
in the Peace River Land District

Located between latitudes 54°56'N and 55°01'N and between longitudes 121°03'W and 121°10'30"W.

NTS map sheets 93-I-14-J, 93-I-14-I, 93-P-3-B.

Work conducted between June 1, 1984 and November 9, 1984.

Owner/Operator - Quintette Coal Limited

Pages 3-12, 3-13, 3-20, 3-21, 3-22, 3-29, 3-30, 3-35, 3-36, 3-42, 3-45, 3-51, 3-53 and much of Appendix 7 of this report contain coal quality data, and remain confidential under the terms of the *Coal Act Regulation*, Section 2(1). They have been removed from the public version.

http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/10_251_2004

TABLE OF CONTENTS

TABLE OF CONTENTS

Page 2

DGSJ/mesw
04/85

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

APPENDIX

IN TEXT:

APPENDICES

SEPARATE VOLUMES

APPENDIX I - GEOPHYSICAL LOGS

I-1 Rotary Holes

Hermann North - Hole numbers: QHR84012, 013, 014, 015, 016, 025

Hermann Gething - Hole numbers: QHR84019, 020, 021, 022, 023, 024

Hermann Syncline - Hole nubmers: QHR84002, 003, 004, 006, 007, 008, 009, 010, 011, 026

Hermann South - Hole numbers: QHR84017, 018, 028, 029, 030

Waterfall Creek - Hole numbers: QBR84008, 012, 013, 014

I-2 Core Holes

Hermann North - Hole Numbers: QHD84001, 002, 003

Hermann South - Hole numbers: QHD84004

APPENDIX II - GEOLOGY PLANS, SECTIONS, CORRELATIONS

		Drawing Number
II-1	Hermann North	
	Geology Plan 1:5000	83-600-20-001-R3
	Geology Plan 1:1250	84-601-20-001-R4
	Section 31700 1:1250	85-601-21-001-R0
	31800 1:1250	85-601-21-002-R0
	31900 1:1250	85-601-21-003-R0
	32000 1:1250	85-601-21-004-R0
	32100 1:1250	85-601-21-005-R0
	32200 1:1250	85-601-21-006-R0
	32300 1:1250	85-601-21-007-R0
	Structure Contour - E Seam - 1:1250	85-600-22-001-R0
	J Seam - 1:1250	85-600-22-002-R0
	General Correlation 1:200	85-601-26-001-R0
	Seam Correlation 1:50	85-601-26-002-R0
II-2	Hermann Gething	
	Geology Plan 1:5000 Hermann Syncline/Gething	84-602-20-001-R2
	Geology Plan 1:2500	85-605-20-001-R1
	Sections and Structure Contour (GT1 Seam)	85-605-22-001-R0
	General Correlation 1:100	85-605-26-001-R0
	Seam Correlation 1:50 GT-1 GT-2	85-605-26-002-R0
II-3	Hermann Syncline	
	Geology Plan 1:2500 & 1:5,000	85-602-20-001-R0
	Sections and Structure Contours	85-602-22-001-R0
	General Correlation 1:100	85-602-26-001-R0
	Seam Correlation 1:50	85-602-26-002-R0

Appendices
Separate Volumes
Page 2

		Drawing Number
II-4	Hermann South	
	Geology Plan 1:5000	84-604-20-001-R2
	Geology Plan 1:2500	85604-20-001-R0
	Sections 25,800; 25,900; 26,000 1:2500	85-604-21-001-R0
	26,100; 26,200; 26,300 1:2500	85-604-21-002-R0
	26,400; 26,500; 26,600 1:2500	85-604-21-003-R0
	26,700; 26,800; 26,900 1:2500	85-604-21-004-R0
	Structure Contour (J Seam) 1:2500	85-604-26-001-R0
	General Correlation 1:200	85-604-26-001-R0
	Seam Correlation 1:50	85-604-20-002-R0
II-5	Waterfall Creek	
	Geology Plan 1:500	84-500-20-001-R4
	Sections 24,400; 24,700; 25,000; 25,300 25,300 1:5000	85-500-21-001-R0
	Structure Contour (J Seam) 1:500	85-500-22-001-R0

QUINTETTE COAL LIMITED

This report documents 1984 geological investigations on licences 3325, 3326, 3339, 3346, 3618, 3660 and 3662 in the Peace River District of Northeast British Columbia. The licences are covered by NTS Map Sheets 93-I-14 and 93-P-3 between latitudes 54°59'N and 55° 01'N and between Longitudes 121°07'30"W and 121°09'00"W. The licences are owned by Quintette Coal Ltd., a company with the following shareholders:

Denison Mines Ltd.	50.00%
Mitsui Mining Co.	12.50%
Tokyo Boeki	10.49%
Charbonnages de France and Minersa	12.01%
Sumitomo Corp.	5.00%
Nippon Steel Corp.	3.84%
Nippon Kokan Kabushiki Kaisha	1.62%
Kawasaki Steel Corporation	1.50%
Sumitomo Metal Ind.	1.49%
Kobe Steel Ltd.	0.88%
Nisshin Steel Co. Ltd.	0.29%
Nakayoma Steel Works Ltd.	0.20%
Mitsubishi Chemical Ind. Ltd.	0.11%
Godo Steel Ltd.	0.07%

This report was prepared by Quintette Coal Ltd. Geological staff.

Geological discussions are based on all geologic work to date, over the last thirteen years. All previous geologic reports are referenced.

This report is submitted April 15, 1985 to support expenditures applied to the licences and grouped licences as a result of the geologic work.

DGSJ/mesw
04/85

STATEMENT OF QUALIFICATIONS

I, David G.S. Johnson, graduated from Mount Allison University, Sackville, New Brunswick, with a Bachelor of Science in Geology in May 1970. I have worked in Mineral Exploration for six years, managing field exploration programs and writing reports and recommendations on those programs. I have worked in Coal Exploration and mine development for the last seven years in Northeast British Columbia. I am responsible for long range geological budgets, planning, interpretations, and reporting for the Geology Department, Quintette Coal Ltd.

David G. S. Johnson
QUINTETTE COAL LIMITED
Tumbler Ridge, B.C.
Canada

DGSJ/mesw

PREFACE

This report documents the exploration and development work completed during 1984 on Quintette Coal Limited's coal licences. The work was completed by Quintette Coal staff, contractors and consultants.

The text provides a regional assessment of the geology and detail geology in areas of concentrated investigations (Hermann North, Hermann Gething, Hermann Syncline, Hermann South and Waterfall Creek). Initial indications are that the coal quality is similar to surrounding mine areas.

This report references all previous geologic assessment reports and feasibility studies written over the past fourteen years on Quintette Coal Limited's licences.

1.0 INTRODUCTION

1.1 LOCATION AND ACCESS

The Quintette property is located in the Rocky Mountain foothills belt of northeastern British Columbia. The coalbearing trend of this region is commonly referred to as the Peace River Coal Block (See location maps, Figures 1.1.1 and 1.1.2).

Air distances to communities surrounding the property are as follows:

The City of Prince George, B.C.	(pop. *71,100)	- 160 km southwest
The City of Dawson Creek, B.C.	(pop. *13,800)	- 106 km northeast
The Village of Chetwynd, B.C.	(pop. * 2,200)	- 98 km north
The Town of Tumbler Ridge, B.C.	(pop. **5,000)	- 20 km east

(* - 1979 Census)
(** - estimate)

The property is accessible by three routes: the Boundary Road (Heritage Highway) from Tupper B.C.; the Fellers Heights Road (Heritage Highway) from Dawson Creek/Fellers Heights; and the road from Chetwynd to the Wolverine River Valley and Tumbler Ridge. The distances for these routes are as follows:

Boundary Rd - Dawson Creek to Tumbler Ridge	210 km
Fellers Heights Road - Dawson Creek to Tumbler Ridge	127 km
Chetwynd to Tumbler Ridge	100 km
Tumbler Ridge to Plantsite	17 km
Plantsite to Hermann Exploration Area	10 km

Access within the property is gained by several existing roads and trails as well as access recently developed for the mine. Figure 1.1.3 shows the main access routes on the Quintette property.

LOCATION MAP
QUINTETTE COAL LIMITED

FIGURE I.I.I

LEGEND

Denison Mines properties

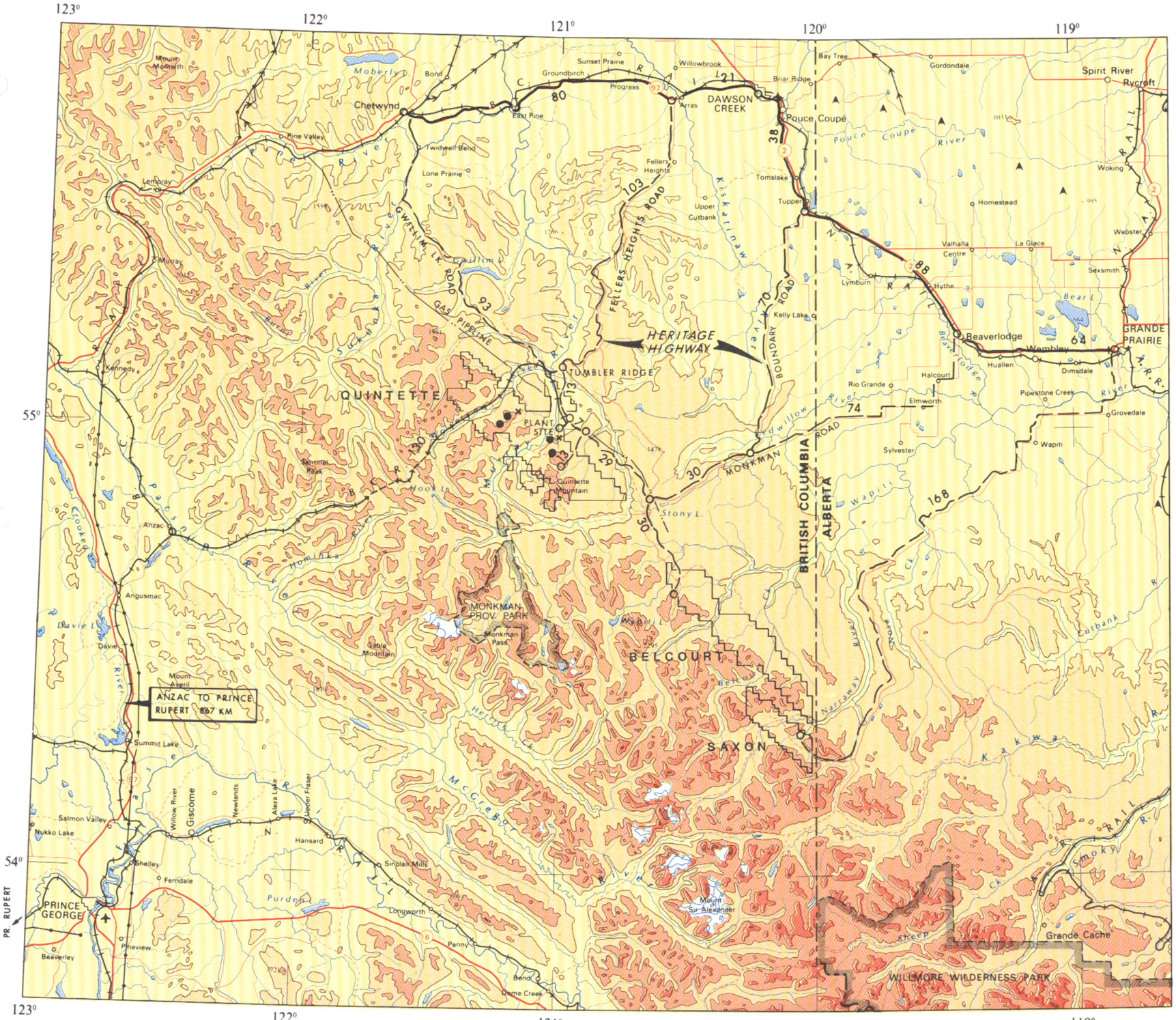
Major roads

Major rail

Distances shown in kilometres between points

0 50 100 miles

0 50 100 150 200 km



HYPSOMETRIC TINTS

Feet	Metres
9843	3000
8202	2500
6562	2000
4921	1500
3281	1000
1640	500

REFERENCE

- Town, population 5,000 - 25,000 — GRANDE PRAIRIE
- Town, population 500 - 5,000 — Jasper
- Town, population under 500 — Kinuso
- Contours (in metres)
- Power line
- Pipeline
- Elevation (in metres) — 1449.
- Railway
- Main highway — 2
- Secondary road
- Other roads
- Track or trail
- Provincial boundary
- Gas or oil field
- Airport

SCALE 1:1,000,000

Kilometres 10 5 0 10 20 30 40 50 60

1 Millimetre = 1 Kilometre

Statute Miles 10 5 0 10 20 30 40

1 Inch = 15.78 Statute miles

APPROXIMATE DISTANCE (in km) BETWEEN POINTS ○—15—○

PAVED ROAD

ALL WEATHER ROAD

DENISON MINES PROPERTIES

PIT LOCATION

CONSTRUCTION CAMP

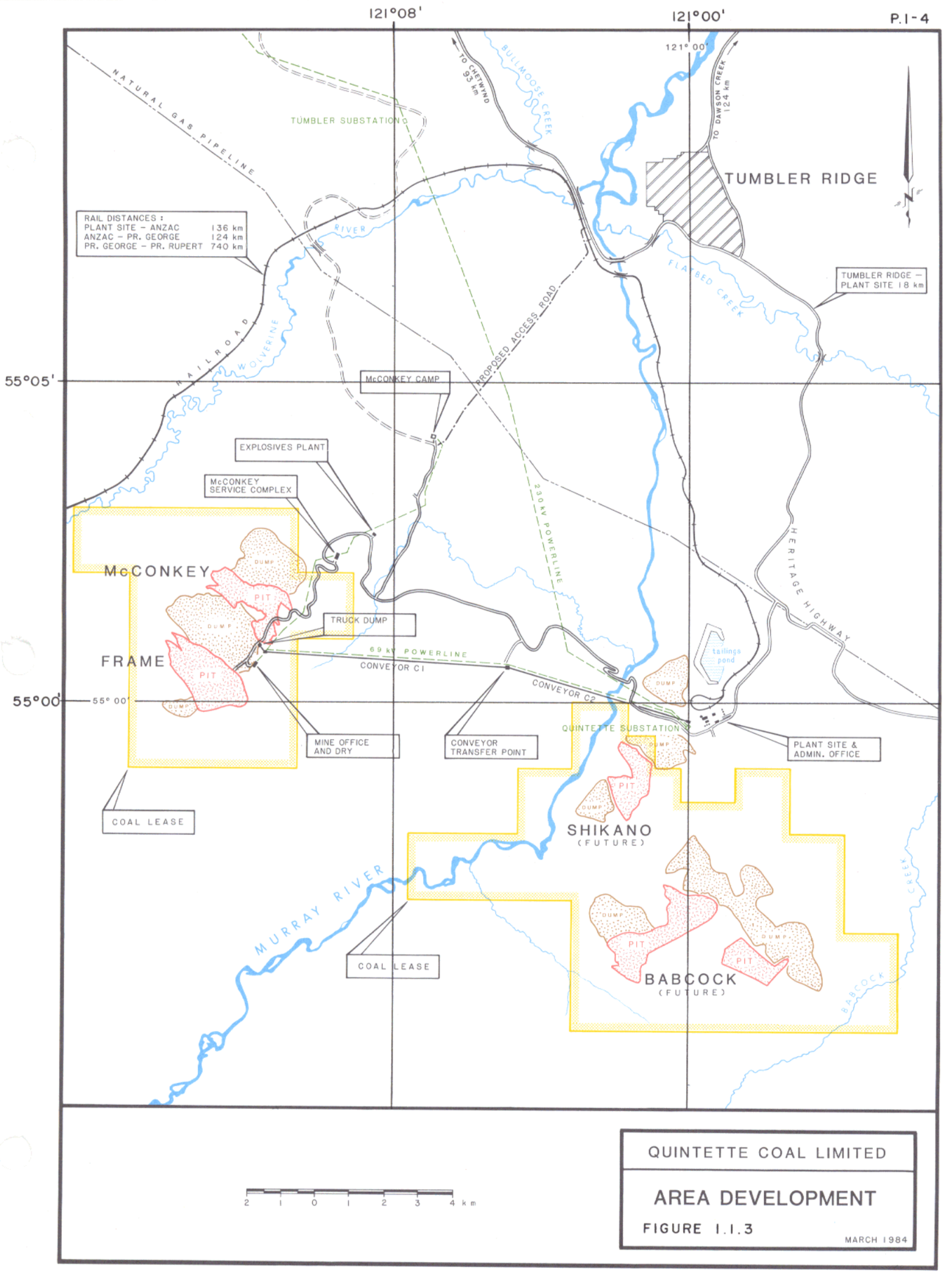
DENISON MINES LIMITED
(COAL DIVISION)
VANCOUVER BRITISH COLUMBIA

NORTHEAST B.C. PROPERTIES

FIGURE I.1.2. OCTOBER 1982

*Lambert Conformal Conic Projection

Map information obtained from Department of Energy, Mines and Resources, Ottawa



QUINTETTE COAL LIMITED

AREA DEVELOPMENT

FIGURE 1.1.3

MARCH 1984

1.2 PROPERTY DESCRIPTION

The Quintette property consists of 165 coal licences covering an area of 39,787 paying hectares and Coal Lease #6 consisting of 11,667 paying hectares. The location of the coal licences are illustrated on the following page (Figure 1.2.1), and legal descriptions of the licences are provided in Appendix 1.

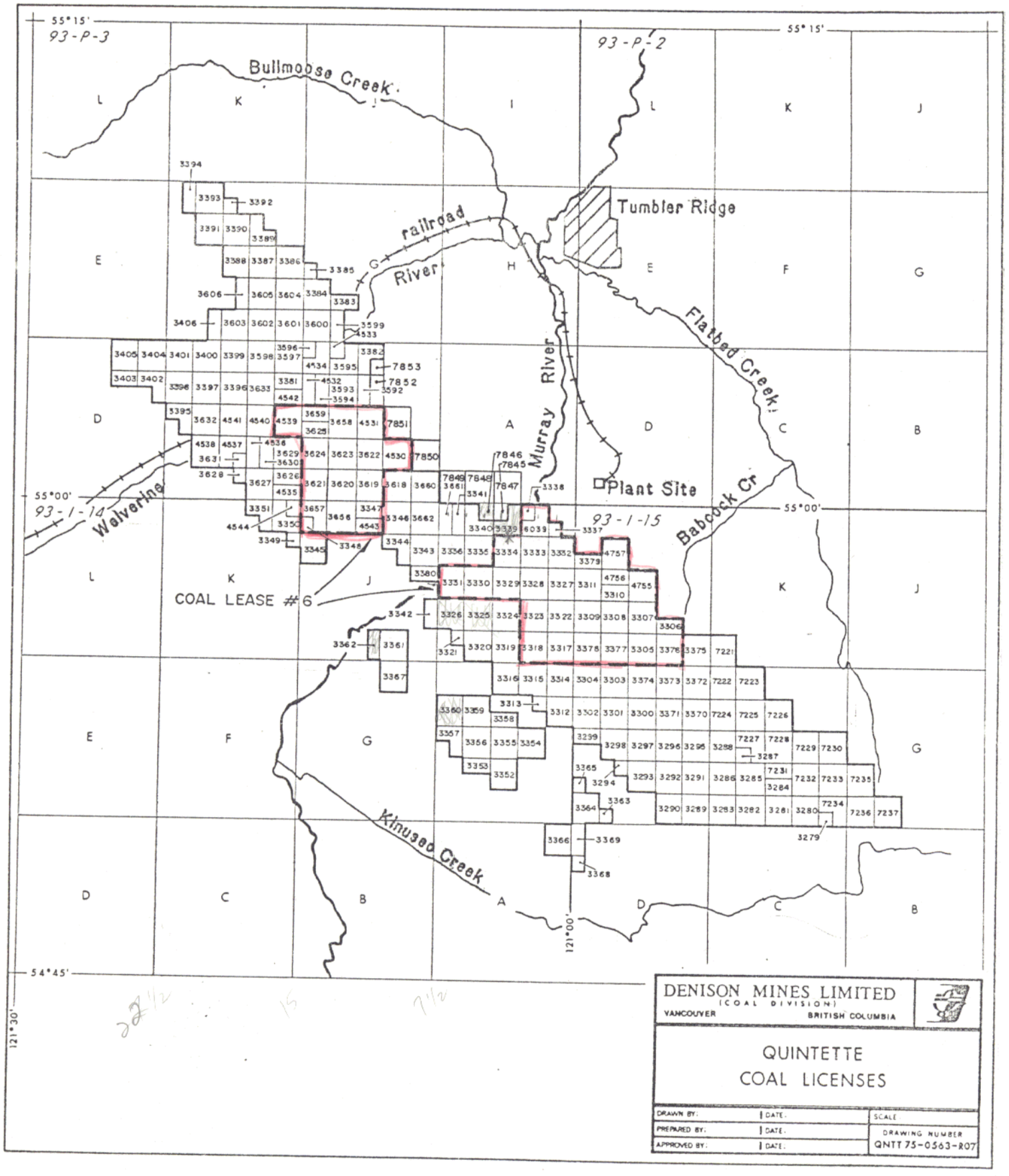
The original Quintette coal licences were acquired by Denison Mines Limited in 1969 and 1970. The first coal exploration on the property was undertaken by Denison in 1971. A significant exploration program was completed each of the following years to 1977. Smaller programs were conducted in 1979 and 1980. In 1981, large scale exploration was again undertaken. Additional licences (7221-7237) were acquired in 1981. In 1982, Dupont Canada Exploration licences (3914-3929) were acquired and these same liceses were dropped in 1984. In 1984, nine new licences were acquired (7845-7853).

For the purpose of developing the coal licences, Quintette Coal Limited was incorporated under the laws of British Columbia on December 20, 1971.

Denison Mines Limited was appointed by Quintette Coal Limited to manage the Quintette project through the feasibility and construction development stages of the project and to assume the ongoing management of the operations during the initial years of operation.

Extensive sampling and testing programs have confirmed that the Quintette coal is a good quality medium volatile coking coal. It is a strong coking coal in its own right, and is capable of replacing most of the world's best medium and low volatile coking coals in blends.

Potential mineable reserves on the Quintette property are estimated at 2.8 billion tonnes of coal in place, to a maximum depth below surface of 500 m.



DENISON MINES LIMITED
(COAL DIVISION)
VANCOUVER BRITISH COLUMBIA

QUINTETTE
COAL LICENSES

DRAWN BY:	DATE:	SCALE:
PREPARED BY:	DATE:	DRAWING NUMBER: QNTT 75-0563-R07
APPROVED BY:	DATE:	

FIGURE 1.2.1

2.0 1984 EXPLORATION/DEVELOPMENT PROGRAM

The 1984 exloration program concentrated in five areas: Hermann North, Hermann Gething, Hermann Syncline, Hermann South, and Waterfall Creek. The areas were investigated by geological mapping, rotary drilling, diamond core drilling, downhole geophysical logging, core and rotary cuttings analysis and petrography.

The investigations were conducted by Quintette Coal Limited's on site staff and the required contractors. The physical work was conducted between June 1, 1984 and November 9, 1984. Reclamation is still outstanding due to an early winter (October 15, 1984).

A total of 37 rotary holes and four diamond drill holes were completed in the exploration areas. All holes were geophysically logged when possible. Geologic mapping was conducted in all areas.

The work areas are highlighted on the 1:50000 scale Regional Geology and 1984 Geological Exploration Map in Appendix 2.

2.1 GEOLOGIC MAPPING

Geologic mapping of the Hermann North area was conducted in the field on blank map cards at 1:500 scale. Mapping started from surveyed drill hole locations or survey points. The traverse then proceeded by chain and compass from that point. This allowed the geologist to maintain his location on the map card. Locations of outcrops were shown on the cards by lithologic symbols; other geologic features were noted by symbol. This information was plotted in the office on the geology plans. Copies of the geology plans with new geologic information are presented in Appendix II along with cross sections and correlation charts.

2.2 ROTARY DRILLING SUMMARY

Rotary drilling was contracted to SDS Drilling, Vancouver, B.C.

Drilling equipment used by SDS Drilling was a Cyclone TH-70 drill with angle capability equipped with Drill Systems dual-wall reverse circulation drill stem and using a down the hole hammer drill when possible. Through overburden, and in holes with high water pressure, rotary tricone bits were used. The drill had the following specifications: top drive 0 to 100 RPM; Gardner-Denver compressor with 535 CFM at 250 PSI; all mounted on a 1974 Kenworth Tandem truck.

A total of 37 rotary holes were completed for a total of 2605 metres. Table 2.2.1 summarizes the rotary drilling by area. Summary sheets for each rotary drill hole are presented in Appendix 4.

The reverse circulation equipment allows for continuous uncontaminated sampling over any interval in the hole. The drill program took continuous samples at one metre intervals, some of which (coal intersections) were retained for analysis.

TABLE 2.2.1

ROTARY DRILLING SUMMARY

Drill Hole	Northing (m)	Easting (m)	Elevation (m)	Total Depth Drilled
Hermann North				
QHR84012*	6096775.5	618343.6	1400.9	109.5
QHR84013	6095730.3	618300.0	1411.2	91.3
QHR84014	6097198.3	618049.0	1310.9	97.4
QHR84015	6097143.4	618028.3	1317.4	60.8
QHR84016	6096881.7	618253.4	1408.8	83.5
QHR84025	6096825.9	618230.8	1412.8	66.8
			Total Metres Drilled	509.3
* Not surveyed (snow covered) measured from QHR84013				
Hermann Gething				
QHR84019	6094835.84	619627.410	1564.2	42.5
QHR84020	6094789.41	619483.774	1582.43	36.6
QHR84021	6094758.28	619409.02	1587.32	36.0
QHR84022	6094857.69	619373.983	1605.49	41.0
QHR84023	6094948.33	619365.605	1614.39	43.0
QHR84024	6095063.27	619353.938	1624.91	42.0
			Total Metres Drilled	241.1
Hermann Syncline				
QHR84001	6095192.69	617810.741	1563.89	50.0
QHR84002	6094935.29	617941.776	1588.98	30.0
QHR84003	6094990.01	617969.582	1588.72	30.0
QHR84004	6094068.44	618039.979	1588.68	30.0
QHR84005	6095176.07	618077.797	1574.23	30.0
QHR84006	6094805.69	618058.733	1605.85	50.0
QHR84007	6094993.68	618169.473	1597.02	60.0
QHR84008	6095061.91	618200.019	1597.71	60.0
QHR84009	6095111.85	618229.204	1598.20	50.0
QHR84010	6094930.21	618028.925	1609.84	60.0
QHR84011	6094975.29	618050.352	1609.15	67.0
QHR84026	6095121.76	618127.470	1597.16	42.5
			Total Metres Drilled	559.5
Hermann South				
QHR84017	6095367.55	624352.731	877.047	128.0
QHR84018	6095285.33	623971.799	857.664	238.3
QHR84027*	6095326.53	623962.416	860.261	32.0
QHR84028	6095484.36	624054.289	879.239	198.0
QHR84029	6095305.80	623944.898	861.390	54.0
QHR84030	6094326.53	623960.416	860.261	36.0
			Total Metres Drilled	686.3
* Not surveyed - 2 m E of QHR84030				
Waterfall Creek				
QBR84007	6090621.69	621920.0	813.821	50.0
QBR84008	6090501.50	621825.436	811.282	134.0
QBR84010	6090470.46	621745.846	802.883	18.0
QBR84011	6090560.69	621873.181	806.268	34.5
QBR84012	6090335.65	621695.439	815.978	134.0
QBR84013	6090256.82	621619.975	816.314	79.5
QBR84014	6090431.32	621743.899	806.969	158.8
			Total Metres Drilled	608.8
			GRAND TOTAL METRES DRILLED	2605.0

2.3 ROTARY CUTTING ANALYSIS

Analysis for F.S.I., and clean ash of the coal cuttings from selected holes and seams, was done at the mine site laboratory for samples taken in Hermann Syncline and Hemann North. Results are presented in Tables 3.2.5.2 and 3.4.5.1. Rotary samples from Hermann South were analyzed in General Testing Laboratories as per their procedure in Appendix 7.1 and results are summarized in Tables 3.5.5.1 and in detail in Appendix 7.2.

The rotary coal samples received for analysis by the Quintette mine laboratory were air dried, riffled, and a representative sample of approximately 300 grams was obtained. No preliminary crushing of the sample was required. The sample was placed in a bath of a solution of Varsol and Tetrachlorethelene that had an S.G. of 1.57. The float material was skimmed off, washed with methyl hydrate and allowed to dry. Three one gram samples were prepared after crushing the material to -60 mesh. These samples were used to determine the F.S.I. A one gram sample was also used to determine the clean ash. Historical data has shown that the 1.57 S.G. provides a clean sample of coal between 7 and 11% ash. Our clean target is 9.5% ash. No reserve sample has been retained.

2.4 CORE DRILLING SUMMARY

Diamond core drilling was contracted to Acadia Drilling, Cranbrook, British Columbia.

Drilling equipment used was a Longyear 44 unitized drilling rig, mounted on skids. Associated equipment included mud pumps, mud tanks, drill stem, water line and other necessary supplies. The drilling method was using a ten foot (3.05 m) wire line core barrel to recover HQ core. Split tubes in the barrel were not used.

A total of four core holes were completed; three in Hermann North and one in Hermann South, for a total of 682.91 m. Table 2.4.1 summarizes the core drilling. Summary sheets for the core holes are presented in Appendix 5. The drill core descriptive logs are presented in Appendix 6.

TABLE 2.4.1

CORE DRILLING SUMMARY

Hermann North

Drill Hole	Northing	Easting	Elevation	Total Depth Drilling
QHD84001	6097258.41	618097.952	1302.92	215.3
QHD84002	6097064.03	618204.547	1390.14	204.70
QHD84003	6096706.59	618493.210	1388.48	153.29
		Total Metres Drilled		573.29
Hermann South				
QHD84004	6095357.44	624377.182	875.76	109.62
		GRAND TOTAL METRES DRILLED		682.91

2.5 CORE ANALYSIS

Analysis of all recovered cored coal intersections greater than 0.50 m in length were analysed by General Testing Laboratories (Commercial Testing), Vancouver, British Columbia.

A total of 59 component samples and 17 composite samples were analysed. The component samples were analysed for proximate, F.S.I. and specific gravity. The composite analysis included proximate, F.S.I., sulphur, phosphorous, specific gravity, Hardgrove grindability, calorific value, washability, plasticity and dilatation.

A flow sheet for the analysis is presented as Figure 2.5.1. The laboratory procedures and analytical results are presented in Appendix 7.

Table 2.5.1 summarizes the drill holes, seams, intervals, component sample numbers and composite sample numbers and intervals.

QUINTETTE COAL LIMITED

1984 DRILL CORE ANALYSIS FLOW DIAGRAM

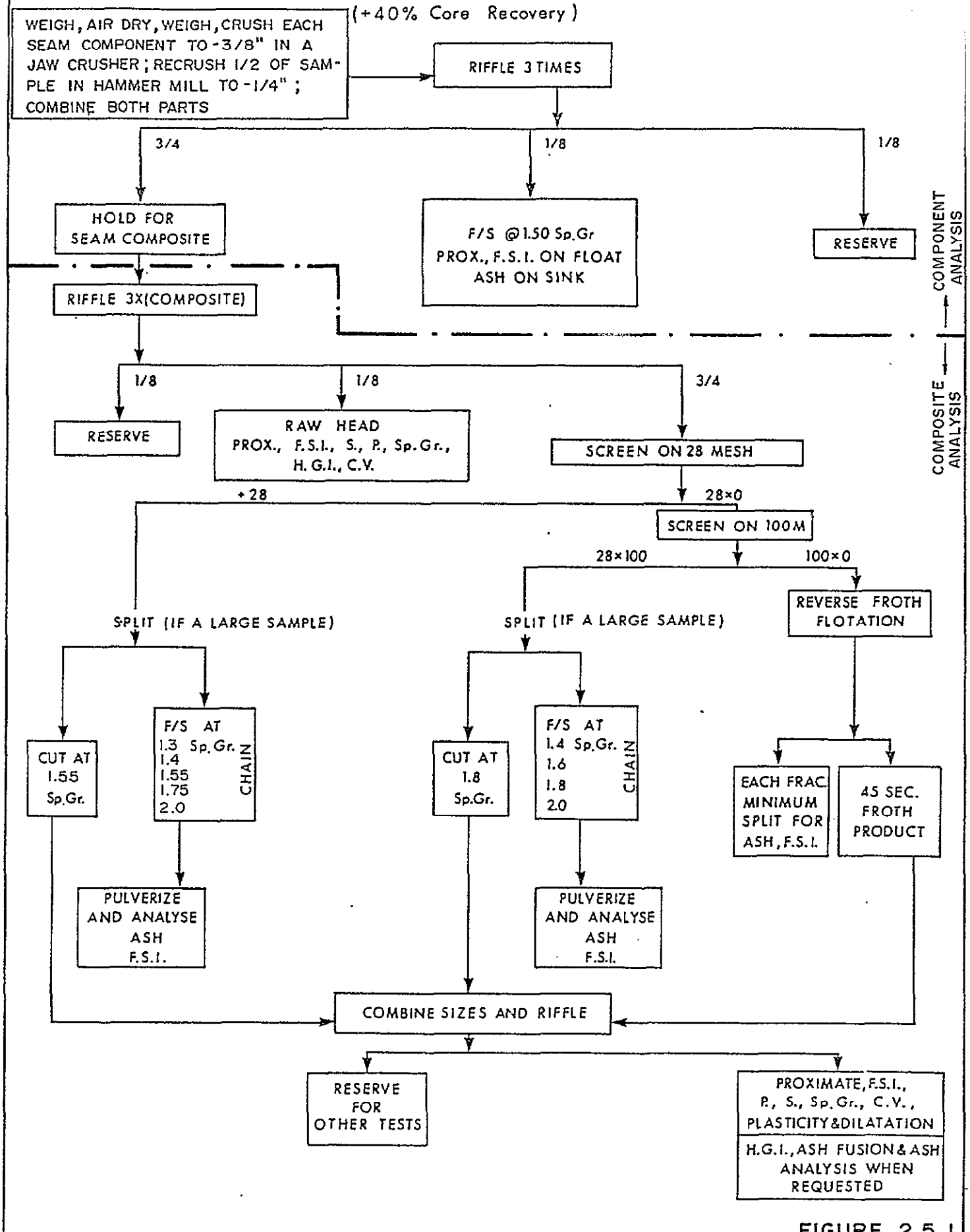


FIGURE 2.5.1

TABLE 2.5.1

CORE SAMPLE SUMMARY

Drill Hole	Seam	Composites Interval	Composites Number*	Components Number**	Components Interval
QHD84001	E1	105.68-111.02		4-E1 Upper	105.68-106.52
				5-E1 Middle	106.52-106.92
				6-E1 Lower	106.92-111.02
				7-E2P	111.02-111.83
	E2/3	111.83-117.16		8-E2	111.83-114.62
				9-E3P	114.62-114.84
				10-E3 Upper	114.84-117.16
				11-E3 Lower	117.16-117.90
	F	123.50-124.55		12-F	123.50-124.55
				13-F Lower	124.55-124.91
	G	142.69-145.38		14-G1	142.69-143.43
				15-G2P	143.43-144.06
				16-G2	144.06-145.34
	J	169.35-177.14	841-1-J	3-J1,J2P,J2	169.35-177.14
	K3	192.26-193.75	841-2-K3	1-K3	192.26-193.50
				2-K3 Lower	193.50-193.75
QHD84002	C1	20.87-22.84	842-8-C	18-C1	20.87-22.84
	E1	96.34-102.86	842-3-E1	8-E1 Upper	96.34-97.50
				9-E1 Up Parting	97.50-97.73
				10-E1 Middle	97.73-99.83
				11-E1 Mid Parting	99.83-100.33
				12-E1 Lower	100.33-102.86
	E2P			13-E2P	102.86-103.74
	E2/3	103.74-110.58	842-4-E23	14-E2	103.74-107.72
				15-E3P	107.72-108.26
				16-E3	108.26-110.58
				17-E3L	110.58-112.72
	F	118.28-119.59		7-F	118.28-119.59
	G	138.90-141.93	842-5-G	4-G1	138.90-139.87
				5-G2P	139.87-140.40
				6-G2	140.40-141.50
	J2	164.87-171.53	842-6-J2	3-J2	164.87-171.53
	K2	189.30-189.61		2-K2	189.30-189.61
	K3	192.12-193.34	842-7-K3	1-K3	192.12-193.34
QHD84003	E1	26.66-31.79	843-9-E1	9-E1 Upper	26.66-27.51
				10-E1 Up Parting	27.51-27.76
				11-E1 Main	27.76-31.79
	E2P			12-E2P	31.79-32.80
	E2/3	32.80-38.22	843-10-E23	13-E2 Upper	32.80-33.60
				14-E2 Main	33.60-35.48
				15-E2 Parting	35.48-35.92
				16-E3 Main	35.92-38.22
	E3 Lower			17-E2 Lower	38.22-39.15
	F	51.18-52.08	843-11-F	8-F	51.18-52.08

TABLE 2.5.1
CORE SAMPLE SUMMARY
(cont')

Drill Hole	Seam	Interval	Composite Number	Component Number	Interval
QHD84003	G	61.62-64.12	842-12-G	7-G1	61.62-62.48
				18-G2P	62.48-63.04
				6-G2	63.04-64.12
	J2	81.86-87.60	843-13-J12	5-J2	81.86-87.60
	K2			2-K2	100.96-101.61
	K3			1-K3	102.85-104.08
QHD84004	F	31.30-35.27	844-14-F	7-F1,F2P	31.30-31.93
				8-F2	31.93-35.27
				9-F2 lower	35.27-36.23
	G	55.46-58.89	844-15-G	4-G1	55.46-57.36
				5-G2P	57.36-57.93
				6-G2	57.93-58.89
	J1	80.40-85.37	844-16-J1	3-J1	80.40-85.37
	J3	86.48-87.63	844-17-J3	2-J3	86.58-87.63
	K			1-K1	91.37-92.06

* All composite numbers are prefixed with "QH"
** All component numbers are prefixed by their drill hole number

2.6 GEOPHYSICAL LOGGING

Geophysical logging of the rotary holes was conducted by Quintette personnel using Quintette owned logging units purchased from Century Geophysical, Calgary, Alberta.

The logging unit is mounted on a four wheel drive, one ton truck, with dual wheels. The logging unit is made up of a winch with 650 m capacity, depth encoder, probe storage racks, mast and boom assembly, remote hoist control, probe power unit, video disply unit, keyboard, computer, dual tape drive, plotter and software.

The unit, with the 9030 and 9055 downhole probes, is capable of producing the following logs: natural gamma, caliper, focussed density, resistivity (9030), and natural gamma, neutron, directional (9055).

General scale (1:200) logs were run with each probe when possible. Detail scale (1:20) logs were run over significant coal intervals. These detail logs (when available) were used to determine coal thickness by picking the halfway point on the line between the highest and lowest density. This also provided the depth of each coal seam as recorded on the summary sheets.

When detail density logs were not available, coal seam intervals were determined from detail or general scale gamma-neutron logs. Gamma-neutron logs were available since they can be run through drill steel. The 9030 tool has too large a diameter for dual wall drill stem. It also picks up the joints in the rotary drill steel.

All geophysical logs are presented in Appendix I.

2.7 ROAD CONSTRUCTION (Reclamation)

In all areas, existing roads, trails and/or seismic lines were used to access wherever possible. All 6 km of new road (see Table 2.7.1) were approximately 7 m in width. The roads were used primarily for drill access and they provide rock exposures for geologic mapping.

Roads were constructed in alpine (Hermann Gething) to densely forested valleys (Hermann South). Construction commenced with flagging a trail through the bush, slashing the trail, skidding good timber, preparing the trail with a D7G dozer and finally bucking and burning non salvageable timber. Final recontouring, crossditching and seeding remains to be done. This could not be completed due to an early winter (October 15, 1984). Final reclamation of roads and drill sites is contracted to be done in late spring or early summer.

TABLE 2.7.1

ROAD CONSTRUCTION SUMMARY

Area	Length
Hermann North	1050 metres
Hermann Gething/Syncline	2300 metres
Hermann South	1550 metres
Waterfall Creek	1100 metres
TOTAL	6000 metres

2.8 SURVEYING

Surveying of drill holes, road locations and mapping points was conducted by Quintette Coal Limited surveyors and the McElhanney Group Limited, Tumbler Ridge, British Columbia.

Quintette Coal Limited completed the surveying in Hermann Gething, Hermann Syncline, Hermann South and Waterfall Creek. They tied into base stations in the pit. McElhanney surveyed in Hermann North by tying into previously surveyed holes in the areas.

All drill hole co-ordinates are recorded in the summary tables of rotary and core drilling, and on the individual drill hole summary sheets in Appendices 4 and 5. Co-ordinates for road locations were used in the map preparation, but are not recorded in this report. Co-ordinates for geologic control points are not recorded, however, points marking coal seams are plotted on geologic plans.

2.9 ACCOMMODATION

All out of town contractors stayed at the Quadra Ventures Commercial camp in Tumbler Ridge, British Columbia. Costs for room and board were borne by Quintette Coal Limited.

2.10 PROJECT MANAGEMENT AND PRIMARY CONTRACTORS

The following permanent and temporary Quintette Coal Limited personnel assisted in the 1984 exploration program (excluding support staff):

G. P. Gormley, Chief Geologist
D. G. S. Johnson, Long Range Geologist
D. McNeil, Geological Technician
P. Taylor, Geological Summer Student
R. Thomson, Logging Technician (temporary)
R. Zemenchuk, Logging Technician (temporary)
G. Holmlund, Geological Technician
G. Doucet, Lab Technician
L. Pendleton, Lab Technician

The following contractors were used:

S.D.S. Drilling Limited	Rotary Drilling
Acadia Drilling Limited	Core Drilling
Les Wood and Sons (Peace Dozing)	Slashing and burning
Loiselle Contracting	Dozer
Quadra Ventures	Room and Board
General Testing Laboratories (Commercial Testing)	Coal Analysis
D.E. Pearson and Associates	Coal Petrography
The McElhanney Group	Surveying

3.0 GEOLOGY

3.1 REGIONAL GEOLOGY

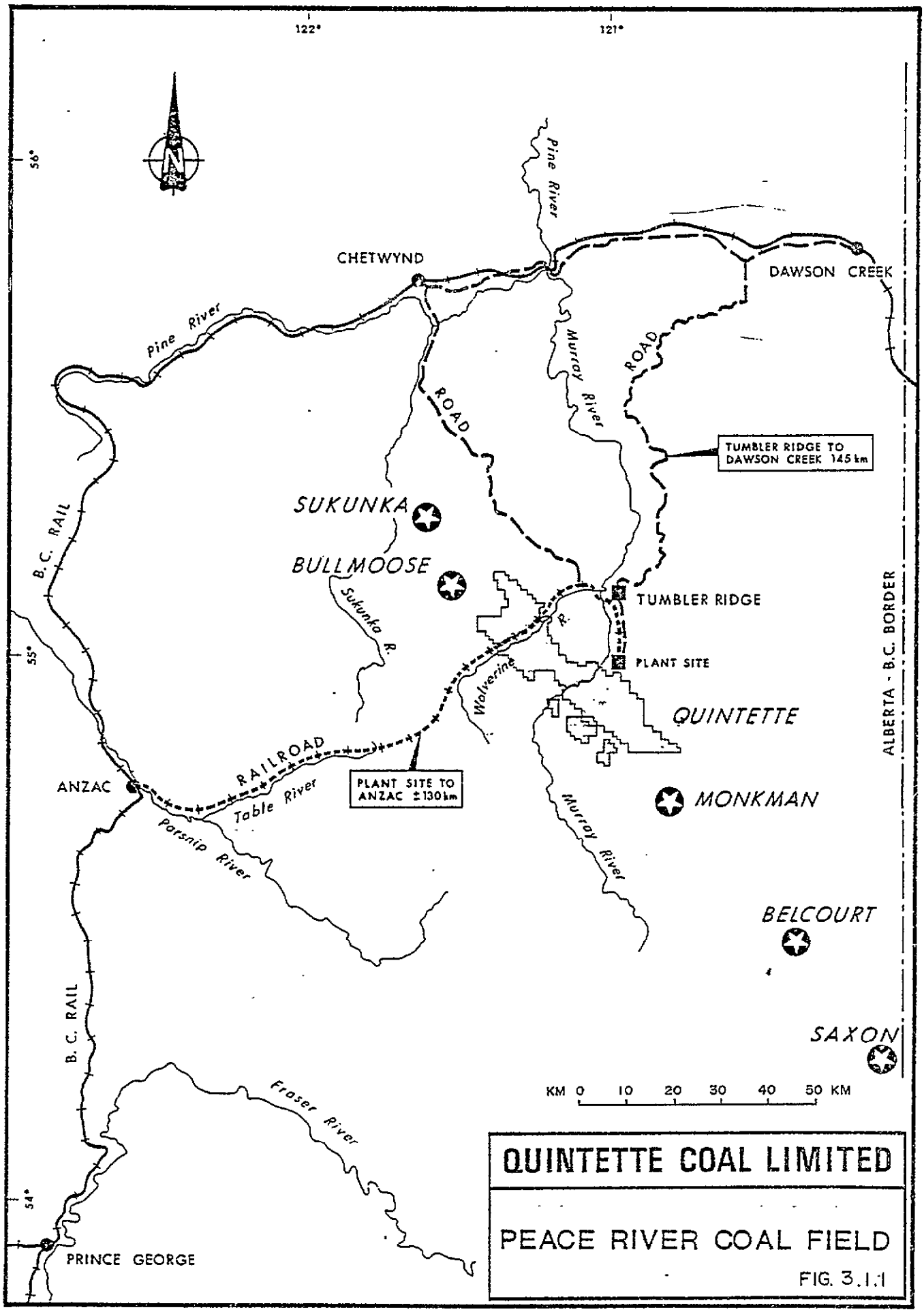
The Quintette Coal property lies within the Peace River Coal Field of northeastern British Columbia. The field extends along the inner foothills of the Rocky Mountains from the Prophet River in the north to the Alberta Boundary in the south. Other major coal properties in the field include Sukunka, Bullmoose, Monkman, Belcourt, and Saxon (Figure 3.1.1).

The coal field is characterized by structural disturbances that resulted from its proximity to the Rocky Mountain structural zone. Major thrusting is common, as is a varying degree of folding. All major features follow a general northwest-southeast trend, reflecting the Rocky Mountain fold structure.

The Gates and Gething Formation are the economically important stratigraphic units in the coal field. Regionally, coal development is most continuous in the Gates Formations, particularly in those areas where mineable reserves have been defined.

In the Quintette property, the folding and faulting has divided the coal-bearing sequence into blocks of varying degrees of mineable potential. The deposits of current economic potential all fall within the Gates Formation.

The geology of the Quintette property is known in detail from photogeological interpretation, extensive field mapping, trenching and drilling. The deposits of current economic interest have been mapped in detail with the major concentration of drilling in those areas.


122°
121°
56°
55°
54°
N
Pine River
CHETWYND
DAWSON CREEK
Pine River
ROAD
Murray River
ROAD
TUMBLER RIDGE TO
DAWSON CREEK 145 km
SUKUNKA
BULLMOOSE
B.C. RAIL
Sukunka R.
TUMBLER RIDGE
R.
PLANT SITE
Wolverine
QUINTETTE
ALBERTA - B.C. BORDER
RAILROAD
ANZAC
PLANT SITE TO
ANZAC ±130 km
Table River
Parsnip River
MONKMAN
Murray River
BELCOURT
B.C. RAIL
SAXON
Fraser River
KM 0 10 20 30 40 50 KM
PRINCE GEORGE
QUINTETTE COAL LIMITED
PEACE RIVER COAL FIELD
FIG. 3.1.1

To the end of 1983, in excess of 590 holes (both rotary and core), totalling approximately 62,000 m, have been drilled on the Quintette coal licences and coal lease (in pit areas) for geological and reserve evaluation purposes.

3.1.1 Regional Stratigraphy

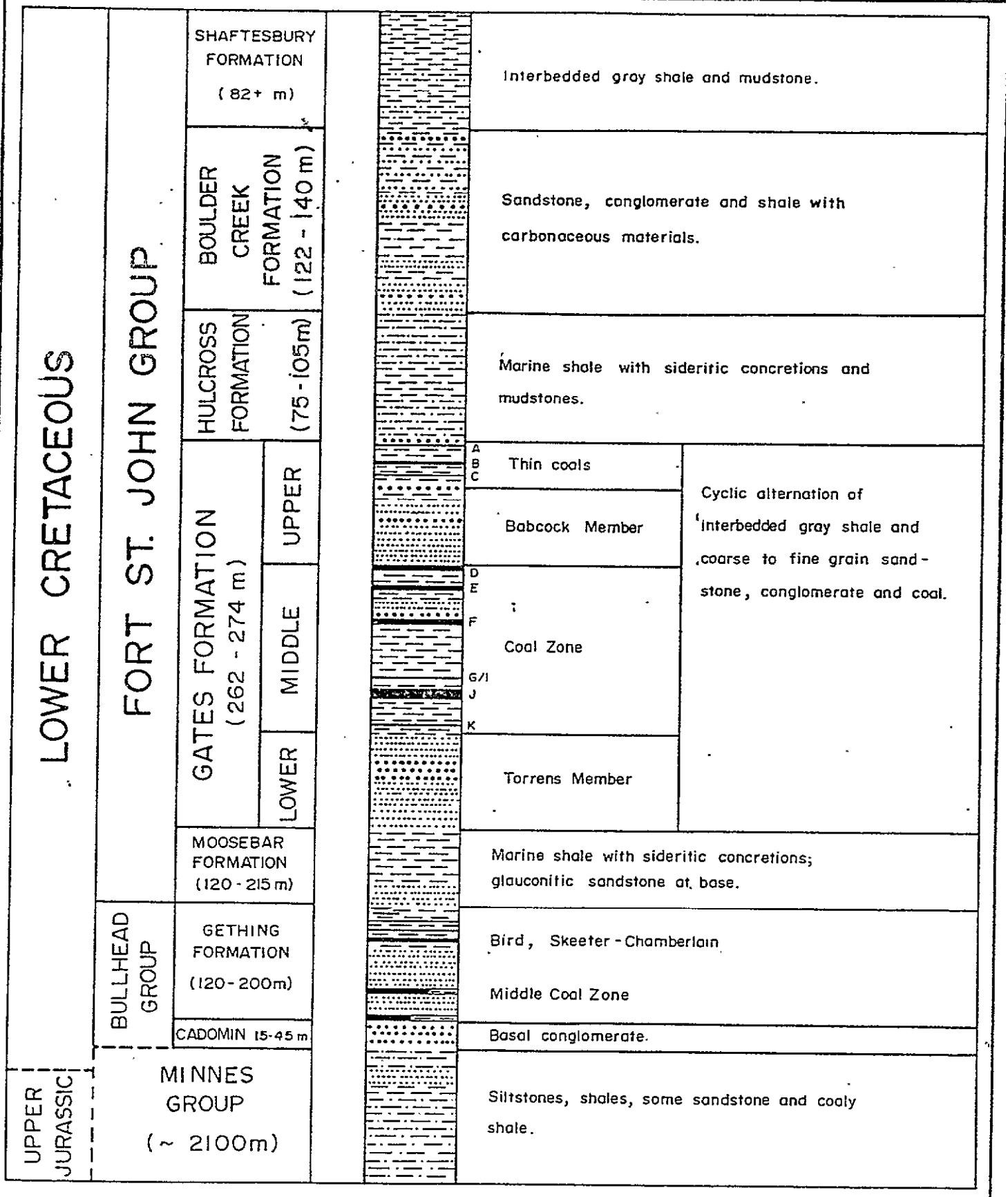
The stratigraphic succession (Figure 3.1.1.1) exposed on the Quintette property ranges from Upper Jurassic to Lower Cretaceous in age, and consists of interbedded shales and sands of both marine and continental origin, with most of the coal-bearing strata being from a deltaic environment. The groups of sediments found on the property are from the Minnes Group, the Bullhead Group and the Fort St. John Group from oldest to youngest.

3.1.1.1. Minnes Group

The Minnes Group is Upper Jurassic/Lower Cretaceous in age. The part of the group mapped consists of cyclic beds of argillaceous fine grained sand, siltstone, carbonaceous shale, and coal. The coal is poorly developed (usually less than 150 mm in thickness) and discontinuous. Below 1525 m elevation*, the group generally occurs under low angle slopes which are tree and brush covered; above 1525 m, it generally forms grey-brown pebbly talus. The change from the Minnes to the Bullhead Group is abrupt, with gradation from fine sand to coarse sand to the sharp contrast of cobble conglomerate usually taking place within 6 m. Only the upper portion of the Minnes Group is present at Quintette; however, it is reported to reach 2100 m in thickness (Stott, 1981).

---

* All elevations given in the report are above sea level (ASL).



QUINTETTE COAL LIMITED

GENERAL STRATIGRAPHIC SECTION

FIGURE 3.1.1.1

3.1.1.2 Cadomin Formation

The Cadomin Formation, the lowest member of the Bullhead Group, consists of well-rounded cobbles and boulders of black, white and green chert, white and grey quartzite and quartz with minor flattened and rounded pebbles of the same material, all of which are bound by siliceous cement. This formation was deposited over an extensive area, ranging in thickness from 15 to 45 m.

The upper contact is defined at the first stratigraphic break in the massive conglomerate. Due to its resistant nature, the formation is usually well exposed. It weathers to a rusty gravel and forms one of the better stratigraphic markers on the property.

3.1.1.3 Gething Formation

The Gething Formation also in the Bullhead Group, consists of alternating units of fine to coarse grained sandstone, carbonaceous shale, coal, sandy shale and conglomerate. The sandstones are thickly bedded to massive, with conglomeratic beds increasing toward the base of the formation. The Gething is poorly exposed on the property, with basal conglomerates forming the only distinctive marker. It varies in thickness from 120 to 200 m.

The upper contact of the Gething is defined by a thin bed of pebble conglomerate followed by a bed of glauconitic sandstone, which signifies the start of marine sediments of the overlying Moosebar Formation. This glauconitic sandstone is probably equivalent to the Bluesky Formation on the Plains area to the east.

In the Gething Formation, three or four coal zones have been distinguished in some localities, although they are not always all present or particularly well developed.

The uppermost Gething coal zone contains the Bird, Skeeter, and Chamberlain Seams, or their equivalents. In some places, the Bird Seam itself becomes a distinct zone and then the main zone must be subdivided into a Bird Zone and a Skeeter-Chamberlain Zone. The Skeeter-Chamberlain Zone seldom exceeds 4 m in thickness. In total, the Bird Seam or Zone may be up to 6 or 7 m thick, although this has only been observed at Roman Mountain along the Quintette trend in the Babcock area.

The middle coal zone of the Gething Formation may not be very persistent. It is now best known in the Hermann Area where the zone is 6 to 7 m thick. In the Wolverine River Area, it is composed of one 2.5 m seam and a 1 m seam or split.

3.1.1.4 Moosebar Formation

The basal sequence of the Moosebar Formation, the oldest member of the Fort St. John Group, consists of homogeneous dark grey to black shale, with thin beds of sideritic concretions up to 0.3 m in thickness and thin beds of bentonite and siltstone. The upper part of the formation consists of banded or fissile sandy shale, very fine sandstone and sandstone with intercalating shales. This latter sequence forms the transition from marine sediments to massive continental sands at the base of the overlying Gates Formation. The variable nature of the transition sequence accounts for the overall variation in the formation which ranges in thickness from 120 to 215 m.

Exposure of Moosebar sediments is normally restricted to areas of high relief where creek channels or gulleys often cut along the strike of the beds.

3.1.1.5. Gates Formation

The Gates Formation ranges in thickness between 250 and 300 m, and lies conformably over the Moosebar Formation. It contains approximately 74% of the regional coal reserves explored to date on the Quintette property. The coal seams have been designated A, B, C, D, E, F, G/I, and K from youngest to oldest.

The lower portion of the formation consists of massive, light-grey, medium-grained sandstones, with minor carbonaceous and conglomeratic horizons, and is tentatively referred to as the Torrens Member. The Middle Gates Member lies above the Torrens Member and contains three, or perhaps four, cyclic sequences of coal deposition within about 90 m of the stratigraphic section, which is terminated by the deposition of the Babcock Member which forms part of the Upper Gates Member.

The cycles of coal deposition in the Middle Gates Member normally begin with laminated medium to fine-grained sandstone and grade to carbonaceous shale and coal. Lenses of conglomerate may also be found in this section which weathers to a light medium orange rubble when exposed above the treeline.

In general, the upper two or three seams reach a maximum thickness of about 3 m (locally 5 m), whereas the lower cycle usually shows the greatest continuity and seam thickness (up to 11 m for seam J). In both the uppermost cycles and the lower cycle, seams may coalesce to form an aggregate thickness up to 12 m, as they do where E and F combine at McConkey , and G/I and J combine in the Roman Mountain area. Excellent correlation of coal seams has been possible over distances up to 13 km in the Babcock area, and additional exploration has provided similarly reliable correlation in the McConkey and Frame areas. It is felt such correlation for the entire property will be possible after more areas have been explored in detail, although at present some regional correlations must be considered tentative.

The Babcock Member, as noted previously, overlies the economic coal zone of the Middle Gates. This unit consists of three distinct units a discontinuous channel conglomerate, a continuous lag conglomerate and a continuous marine sandstone. The unit is resistant and forms a useful marker for the top of the Middle Gates.

The portion of the Upper Gates Member which overlies the Babcock Member contains a predominantly shale sequence with intercalating sandy shale or very fine sandstone and poorly developed coal. Two or three coal cycles (containing seams A, B, and C) have been recognized in this sequence; however, they have not yet been found to contain sufficient thickness, quality and continuity to be given economic consideration. A very thin bed of chert pebbles with ferruginous cement marks the contact of the overlying marine sediments of the Hulcross Formation.

3.1.1.6. Hulcross Formation

The Hulcross Formation consists of 75 to 105m of rubbly or blocky, medium to dark grey shale with thin interbeds of siltstone and very fine sandstone. Sandstone and siltstone interbeds are more prevalent near the top of the formation where a few kaolinite beds have also been observed. The formation is more homogeneous near the base and contains sideritic concretions.

3.1.1.7. Boulder Creek Formation

The Hulcross marine shale grades conformably into shale, sandstones, and conglomerate of the Lower Boulder Creek Formation. The middle part of the Formation consists of alternating fine grained sandstone, shale and thin coals, while the upper part consists of massive conglomerates and conglomeratic sandstones. The Upper Boulder Creek lithology closely resembles that of the Babcock Member of the Gates Formation. A range in thickness of 122 to 140 m has been measured in the Boulder Creek Formation.

3.1.1.8 Shaftesbury Formation

The lower portion of the Shaftesbury Formation, consisting of dark-grey to black marine shale with minor siltstone, overlies the Boulder Creek Member and completes the stratigraphy exposed at Quintette. This formation closely resembles Hulcross shale. Exposures of the Shaftesbury Formation are restricted to the axes of the major synclines at high elevations and to the northeastern border of the licence area.

3.1.2 Regional Structure

Primary structural controls in the Peace River Coal Field are the regional thrust faults which have brought the coal-bearing strata to the surface. Within the Quintette property, (see Appendix 2, Regional Geology map) in areas which contain the coal- bearing formations, the main geological structures are broad synclines and sharper anticlines which are separated by low to medium angle thrust faults from the more highly deformed Minnes Group. The faults dip to the southwest and have vertical displacements of up to approximately 100 m. Minor folding on the major fold limbs is uncommon, but minor thrusts frequently parallel or splay from the major faults.

Geological structures and topography define to a large extent, the coal reserve areas within the Quintette property. This is most obvious in some of the potential pit areas where the coal reserves are entirely contained within synclines which form topographic highs. Underground reserves are located in large, structurally continuous blocks on limbs of anticlines and synclines. Faulting is not frequent within these structures, although it does become more frequent as the degree of structural deformation increases. For example, the Roman Mountain reserves, which are located in a tight chevron fold, more often contain small faults than those in the much broader (flat) Babcock Mountain structure, where the few faults that have been observed have displacements in the order of only 5 or 10 m.

3.1.3 Regional Coal Seam Correlation

Within the Quintette property, three stratigraphic units are particularly valuable for regional correlation. These are the distinctive Cadomin conglomerate, and the Moosebar and Hulcross shales. Although there is some similarity between the Hulcross and Moosebar shales, they can usually be distinguished by their relationships to surrounding strata and the absence of glauconitic sands at the base of the Hulcross. The two main coal-bearing units, the Gates Formation and the Gething Formation, are easily distinguished.

A regional correlation of the important formations and coal zones on the Quintette property is presented in Appendix 3. Composite sections from each of the major reserve areas demonstrate the regularity of the development of the strata within the property and illustrate that all important coal development within the Gates Formation between the persistent and readily defined Babcock and Torrens Members.

The Babcock Member overlies seam D and this seam has been used as a marker for correlation. Seam J is often located just above the Torrens Member (Quintette sandstone), or occasionally above siltstones and shales that separate it from local development of seam K (for example, in the Babcock and Roman Mountain areas).

Between the D and J coal seams, there is considerable variation in the E and F seam developments which may effectively constitute a separate coal zone. In the McConkey area, these seams appear to coalesce to form a significant coal zone containing approximately 7 m of coal.

Seam G is particularly well developed in the northern regions of the Babcock and Quintette trend deposits, where it attains a thickness ranging from 1.7 to 2.1 m and is developed between 4 and 13 m below seam F. The 1977 drilling program

in the northern and central portions of Babcock Mountain indicated a rapid thickening of the F/G interseam sediments such that G seam can be correlated with seam I in the central and southern portions of the deposit. This finding is further illustrated in the discussions of the Babcock deposit stratigraphy, and indicates that seam G may be equivalent to seam I (G/I) throughout the southern portion of the property. It was originally thought that seams F and G had coalesced in this region. The G/I seam is normally developed between 3 and 10 m above the J seam; however, in some locations the seams essentially coalesce to form very significant widths of mineable coal (Roman Mountain, Quintette Trend, McConkey Mine and Perry Creek Anticline). Seam K is apparently a split from seam J as the two seams nearly merge in the Little Windy portion of Babcock.

The major coal zones of the Gething Formation are not as well documented as they are in the Gates Formation. However, it is clear that the Bird Zone or Seam is regionally continuous. The relationship of the Skeeter and Chamberlain Seams to this zone is uncertain and they may form a separate zone or be part of the Bird Zone. In the Wolverine and Murray (McConkey and Frame) areas of the property, these seams are well separated by about 30 m of strata, but apparently merge in the southern part of the property (Babcock, Quintette Trend, Roman Mountain). At Five Cabin, just a short distance from Roman Mountain, only a remnant of the Bird Zone is present, but a seam which is very similar in characteristics to the Chamberlain Seam is well developed (3 m thick).

The middle coal zone of the Gething Formation has been documented in only a few places, and to date it is known to attain a potentially economic thickness only in the Wolverine area where one split is about 2.5 m thick and in the Hermann area where the zone contains 6 m of coal. More exploration is required before the full significance of this zone can be determined.

3.2 DETAILED GEOLOGY - HERMANN NORTH

3.2.1 Description

The Hermann North area is accessed by the Nabors Road. The area is approximatley 1 km west of the coal conveyor and staddles the Nabors road (see geology plan, in Appendix II-1). The area is completely forest covered, with elevations ranging from 1230 m to 1428 m in the coal bearing area.

Previous drilling has been conducted in 1982 (QHR8205, 8206) and in 1983 (QHR83001, 83002, 83003, 83004, 83005). These drilling programs, along with detailed geologic mapping, indicated a relatively simple structure with a good coal section. Therefore, the 1984 exploration program was designed to further delineate the coal and obtain coal quality data. Therefore, six rotary and three core holes were completed along with detailed geologic mapping of new rock exposures.

The geology map, cross sections, structure contours (all at 1:1250 scale) and a general correlation and seam correlation are presented in Appendix II-1.

3.2.2 Stratigraphy

Within Hermann North, all formations from Moosebar to Boulder Creek are exposed. The coal bearing Gates Formation has an estimated total thickness of 300 metres.

From mapping and drilling, the upper Gates Formation is 160 m thick. This unit is from the bottom of the Hulcross Formation to the top of the first coal seam in the middle Gates Formation (E seam). One thin (1.44 m) discontinuous seam has been tentatively identified as C seam in the upper Gates. This seam is approximately 52 m above E seam. The major rock type is a relatively monotonous sequence of fine sandstones and siltstones with some medium grained sandstones in the 20 m above E seam.

In the middle Gates Formation, varying in thickness from 68 m to 61 m, the rock lithologies have a greater variation ranging between medium grained sandstones to silty claystones, carbonaceous claystones, and coal. The coal seams that have been recognized in this zone are E, F, G, J and K.

The lower Gates Formation, below K seams is at least 70 m thick and has not been completely penetrated by drilling. From mapping and drilling it is a typical section of coarsening up sequences of fine to coarse grained sandstones.

Other formations are best described in the Regional Geology section. Table 3.2.2.1 summarizes the interseam lithologies and thicknesses.

TABLE 3.2.2.1

HERMANN NORTH - INTERSEAM THICKNESSES AND LITHOLOGIES

Interseam	Thickness Range	Lithology
E to F	5 to 9 metres	Medium sandstone in thick areas to very carbonaceous and coally below E
F to G	7 to 9 metres	Siltstone to fine sandstone
G to J	13 to 15 metres	Siltstone to medium sandstone with occasional carbonaceous bands
J to K	7 to 13 metres	Medium sandstones to very carbonaceous claystone zones

3.2.3 Structure

The structure in the Hermann North area is a simple monocline with a flexure at depth in the north end of the area as interpreted from QHD84001.

Dips within the area of interest, range from nearly vertical to 10°, although, in general, an average dip of coal seams ranges from 37° to 58° (south end to north end).

Three fault zones have been interpreted. The largest displacement is interpreted from drilling and mapping and indicates a vertical separation of 55 m. However, this fault is not well defined and is currently well beyond the planned mine limits.

Two smaller displacement zones have also been interpreted and both require further definition. They both show vertical displacements of less than 10 m. The zone in the K and J seam sequence (Section 31900) at surface is interpreted based on a thickened interseam. This fault, if it exists, will affect mining.

3.2.4 Coal Seam Development and Correlation

As is typical of the Gates Formation coal seams, correlation within this exploration area is excellent. Seams C, D, E, F, G, J and K are recognized. Table 3.2.4.1 summarizes the seam thickness in the 1984 core holes. A seam correlation chart is presented in Appendix II-1.

The uppermost seam in the sequence has been named C seam. Its correlation with C seam in McConkey Pit is only tentative. The seam is overlain by a thin pebble conglomerate that probably indicates a marine transgressions, similar to that above D seam in other areas. For this reason the seam was initially identified as D seam. Core hole QHD84002 intersected C seam showing it to have two mining sections over 0.5 m separated by a thick (0.66 m) parting. The seam appears typical of upper Gates Formation coal seams in that it is discontinuous (see General stratigraphic correlation on chart in Appendix II-1). The upper and thickest mining section is 1.44 m.

E Seam is easily correlatable throughout the exploration area, ranging in mining thickness from 7.01 m to 8.83 m (excludes the prating above E2). The seam is divided into three distinct zones, E1, E2 and E3. Seam E1 contains many small rock partings and is considered a separate mining section, its thickness ranging from 3.55 m to 4.04 m.

The lower mining section in E seam is the combined E2 and E3 zones, separated from E1 seam by a parting ranging in thickness from 0.63 m to 0.76 m. This lower zone ranges in thickness from 3.46 m to 4.79 m. The zone is underlain by a high ash zone that makes the ability to distinguish the base of E seam difficult. This zone ranges in thickness from 0.57 m to 1.38 m.

F seam is a thin (0.69 m to 0.90 m) rider 5 to 9 m below E seam. This seam may be correlatable to E4 seam in McConkey Pit.

G seam is made up of two coal partings and a rock split. The entire seam ranges in thickness from 2.01 m to 2.18 m with the rock split being from 0.37 m to 0.49 m. Including the parting in the mining section, this seam has very high ash values (see section 3.2.5) although the coal itself is clean.

J seam is a very clean seam. The seam is divided into a thin upper zone and a lower zone. The upper zone in the North of the pit is 0.97 m thick and is considered part of the mining section. This upper zone is not considered recoverable elsewhere. The lower zone ranges from 4.43 m to 5.00 m (south to north).

K seam is separated into three small seams, K2, K3 and K4. Of the three, K3 is mineable throughout the pit, ranging in thickness from 0.82 m to 1.07 m. K2 seam may be recoverable, although its thickest section (0.74 m) has a thick parting. These seams may be equivalent to the lower portion of J seam in McConkey Pit.

The cummulative mineable coal seam thickness (seams E1, E2/3, F, G, J, K3) in Hermann North, ranges from 15.23 m to 17.93 m.

TABLE 3.2.4.1

HERMANN NORTH - SEAM THICKNESSES

Drill Hole	Seam	Thickness (m) (Coal/Coal + Rock)
QHD84001	C1	0.16/0.19
	E1	3.03/4.03
	E2 Parting	0.00/0.76
	E2/3	3.92/4.28
	F	0.66/0.72
	G	1.52/2.01
	J	5.77/5.97
	K2	0.49/0.74
	K3	0.79/0.92
QHD84002	C1	1.44/1.44
	E1	3.69/4.04
	E2 Parting	0.00/0.63
	E2/3	3.90/4.79
	F	0.74/0.90
	G	1.63/2.18
	J	4.63/4.63
	K3	0.72/0.82
QHD84003	E1	2.55/3.55
	E2 Parting	0.00/0.64
	E2/3	2.85/3.46
	F	0.55/0.69
	F	1.38/2.03
	J	3.79/4.43
	K2	0.51/0.56
	K3	0.83/1.07

3.3 DETAILED GEOLOGY - HERMANN GETHING

3.3.1 Description

The Hermann Gething area is accessed by the Nabors Road to the gas well in Hermann Sycnline and then by exploration trail (2 km) past the well. The area is alpine to subalpine, lying on the Murray River side of the divide between the Murray and M-20 creek. Elevations in the coal bearing area range between 1490 m and 1630.6 m. Slopes below 1490 drop off very steeply towards the Murray River.

Previous drilling in the area consisted of one drill hole in 1976 (QJD7642). This drill hole and geologic mapping indicated the potential of this structurally simple area. The 1984 program consisted of six rotary holes designed to confirm the thickness and continuity of the coal intersected in QJD7642.

The geology map, cross sections, structure contour (all at 1:2500 scale) and a general and seam correlation and presented in Appendix II-2.

3.3.2 Stratigraphy

The only formation identified in the immediate area of Hermann Gething is the Gething Formation.

The thickness of the formation in this area has not been determined, however, its thickness is considered to be typical for the Gething at approximately 200 m.

The coal seams of interest are considered to be in the middle Gething coal zone (Skeeter-Chamberlain). Mapping along the exploration trail that accessed the area idntified coal seams at the top of the Gething (Bird seam) and a thick (10 m) conglomerate overlying a 1.76 m seam (GT1) in the middle Gething. These

seams are shown at 1:20 scale in Figure 3.3.2.1 and identified on the Geology plan as Station #1 and Station #2 respectively.

Stratigraphically below the GT1 seam (Station #2) the formation became structurally complex with overturned beds and faulting. This mapped section from the top of the Gething Formation is approximately 90 m true thickness. The Bird Seam and GT1 seam are separated by approximately 30 m. Table 3.3.2.1 summarizes the lithologies between the Bird, GT1 an GT2 seams.

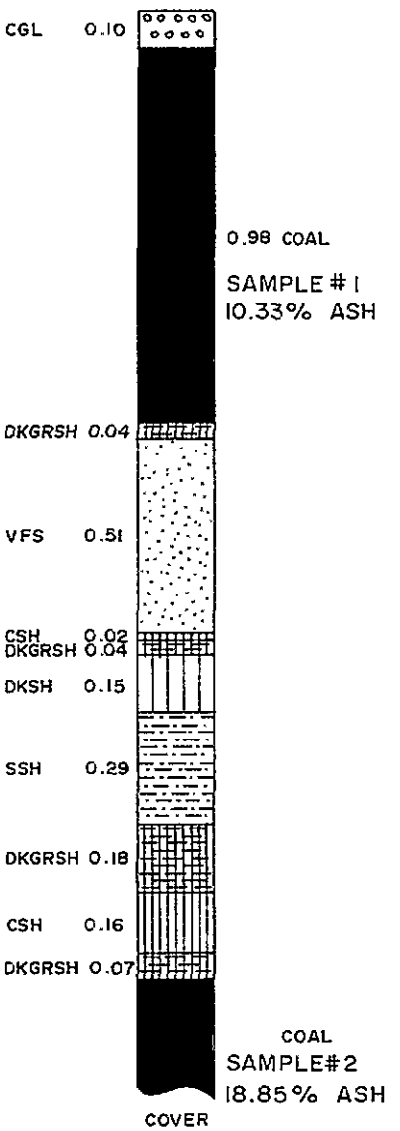
The seam correlation and general stratigraphic correlation in Appendix II-2 show the lithologies and variations. In one dril hole (QHR84024) no coal was intersected. However, due to lack of any structural indications, the current interpretation has the GT1 and GT2 seams ashing out to the northest. (see structure contour in Appendix II-2).

HERMANN GETHING

MAPPING SECTION - GETHING COAL SEAMS

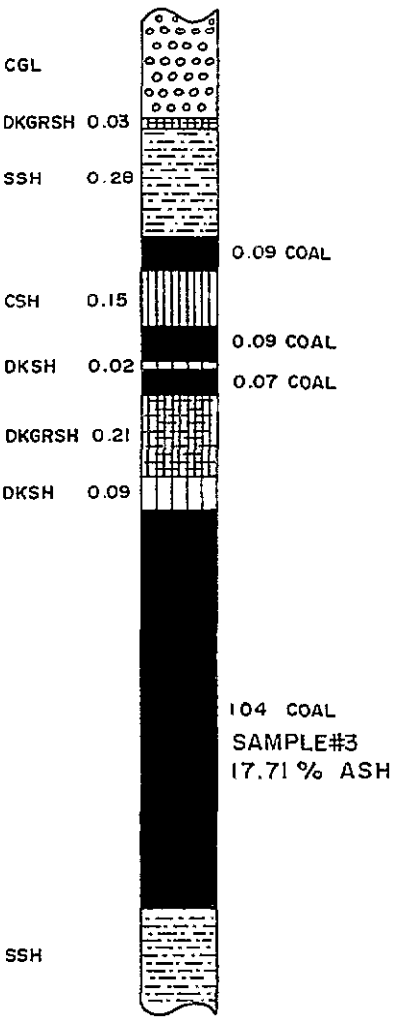
STATION# 1

BIRD SEAM



STATION# 2

GTI SEAM



Date	06/04/85
Design	D J
Drawn	KJV
Scale	1:20 (VERT)

QUINTETTE COAL LIMITED

Project Manager

DENISON MINES LIMITED

COAL DIVISION

FIGURE 3.3.2.1

Drawing No

Rev

BCIL 7.4.2.OCL

TABLE 3.3.2.1

HERMANN GETHING - INTERSEAM THICKNESSES AND LITHOLOGIES

Interseam	Thickness Range	Lithology
Bird - GT1	~ 30 m	medium sandstones to carbonaceous siltstones in upper portion. Lower 10 m is conglomerate with coarse to medium sandstone matrix.
GT1 to GT2	3.2 m - 8.9 m	Thin fine sandstones with silty and carbonaceous claystones

3.3.3 Structure

The structure in the area of mining interest is a simple dip slope. (See the structure contour, cross sections and geology plan in Appendix II-2.)

The seams are dipping at an average 9° to 10°. They are capped by the conglomerate described earlier, and where the conglomerate is eroded, the seams are interpreted to outcrop.

A fault was intersected in one drill hole (QHR84019). This fault results in a lower block of coal in the eastern side of the area of interest (see structure contour).

The structure to the north and east of the drilled area becomes much more complicated. Further work is required in these areas to better define structure and extent of coal.

3.3.4 Coal Seam Development and Correlation

The two coal seams of interest are identified as GT1 and GT2. The seam correlation chart in Appendix II-2 graphically shows the seam variation and correlation. This chart was made from geophysical logs - no correction for dip was made since it was considered insignificant.

Seam GT1 is a clean seam with few rock partings. The seam ranges in thickness from 2.78 m to 6.49 m. As notes previously, the seam is currently interpreted to ash out to the north east. The thinner intersection (QHR84022) could possibly be structurally related.

Seam GT2 is a very high ash seam three to eight meters below GT1. It usually contains two to three distinct rock partings that can be correlated. Its thickness ranges from 0.72 m to 3.52 m, the thicker sections containing over 1 m of inseam rock. This seam is also noted to ash out to the northeast.

Table 3.3.4.1 summarizes the coal seam thicknesses as interpreted from the geophysical logs.

TABLE 3.3.4.1

HERMANN GETHING - SEAM THICKNESSES

Drill Hole	Seam	Thickness (m) (Coal/Coal + Rock)
QHR84019	GT1	Structurally complicated - thickness not usable
QHR84020	GT1	5.44/6.49
	GT2	1.85/2.95
QHR84021	GT1	6.23/6.54
	GT2	1.69/2.71
QHR84022	GT1	2.64/2.78
	GT2	2.46/3.52
QHR84023	GT1	5.60/6.26
	GT2	1.50/2.20
QJD7642	GT1	5.54/6.44
	GT2	0.72/0.72

3.4 DETAILED GEOLOGY - HERMANN SYNCLINE

3.4.1 Description

The Hermann Sycnline area is accessed by the Nabors Road which terminates at gas well d-83-J-93-I-14. The gas well is in the centre of the syncline which contains near surface Gates Formation coal. (See Geology Plan in Appendix II-3.) The area is subalpine and was completely tree covered. However, a large portion was cleared for the gas well. Elevations in the area of interest range from 1555 m to 1611.8 m.

Previous drilling has been conducted in 1980 (QJR8001) and 1982 (QJR8201, 8202). Two of these drill holes intersected all three coal seams, indicating mineable coal seams at a relatively shallow depth. Geologic mapping indicated a simple open syncline. Therefore, the 1984 drilling program was planned to further delineate the coal seams.

The geology map, cross sections, structure contours (all at 1:2500 scale) and a general correlation and seam correlation are presented in Appendix II-3.

3.4.2 Stratigraphy

Within the coal bearing area, only the middle and lower Gates Formation is exposed. Surrounding the Syncline, Moosebar and Gething Formations are also interpreted and mapped.

The general stratigraphic correlation in Appendix II-3 shows the lithologies surrounding the coal seams in the middle Gates. Table 3.4.2.1 summarizes interseam thicknesses and lithologies. The overall thickness of the coal bearing section that has been drilled is 30 m. Drill hole QJR8001, drilled well below K seam, indicates the typical coarsening up sequences of the lower Gates Formation.

TABLE 3.4.2.1

HERMANN SYNCLINE - INTERSEAM THICKNESSES AND LITHOLOGIES

Interseam	Thickness Range	Lithology
Above G	< 10 m	Medium sandstone to siltsones and claystones above G
G to J	8-11 m	Fine sandstone to carbonaceous and coally claystones.
J to K1	4-5 m	Siltstones to coally claystones
K1 to K2	0.6-1 m	Claystones
K2 to K3	1.5-3 m	Fine sandstones to carbonaceous claystones

3.4.3 Structure

The structure in Hermann Syncline is an open syncline that has a flat western limb and a deeper steep limbed trough along its axis. The east limb is very steep, approaching vertical. (See structure contours and sections in Appendix II-3.)

No faulting is identified in the coal zone, although minor displacements can be expected near the flexure in the west limb and near the synclinal axis.

3.4.4 Coal Seam Development and Correlation

Correlation of the coal seams within the syncline is excellent, the area being of relatively small aerial extent. The seam correlation chart in Appendix II-3 graphically shows the seam consistency.

Seam G is approximately 1.60 m thick with a typical rock parting at the middle and near the top.

Seam J is consistently 5.3 to 5.5 meters thick. It has some thin partings in the top half and a correlatable parting near the middle. Both the roof and floor are carbonaceous, but are easily defined.

Of the K seams, K2 seam is the only one considered recoverable at this time. It is approximately 1 m thick with no partings. K1 seam is usually less than 0.5 m with no partings. K3 seam consists of two coal zones, each less than 0.5 m and separated by a parting greater than 0.5 m.

Table 3.4.4.1 summarizes the coal seam thicknesses as interpreted from the geophysical logs. The summary is for the four holes used in the correlation chart.

TABLE 3.4.4.1

HERMANN SYNCLINE - SEAM THICKNESSES

Drill Hole	Seam	Thicknesses (m) (Coal/Coal + Rock)
QHR84006	J	4.86/5.44
	K2	0.96/0.96
QHR84007	J	5.12/5.48
	K2	1.04/1.04
QHR84011	G	1.29/1.59
	J	4.89/5.36
	K2	1.04/1.04
QHR84026	G	1.33/1.62
	J	5.02/5.50
	K2	1.04/1.04

3.5 DETAILED GOLOGY - HERMANN SOUTH

3.5.1 Description

The Hermann South area is accessed by 1.5 km of new exploration road from the M-19 Gravel Pit (see the 1:5000 scale Geology Plan in Appendix II-4). The area is a southwest facing slope, in the Murray river valley and is completely forest covered. Elevations within the area of interest range from 780 m to 1000 m.

The only previous work in the area had been regional mapping (1:5000 scale). From this mapping, aerial photographic interpretations, and the extrapolation of the Shikano structures on the other side of the Murray river, a potential strippable coal reserve was recognized. For this reason a preliminary exploration program was designed around geologic mapping, core drilling (1 hole) and rotary drilling (6 holes).

The geologic maps, cross sections, structure contour and general stratigraphic correlation and seam correlation are presented in Appendix II-4.

3.5.2 Stratigraphy

Within Hermann South, Moosebar, Gates, Hulcross and Boulder Creek Formations have been indentified by mapping on a regional scale. Only the Gates Formation has been mapped in detail along with new exposures on the exploration road.

Boulder Creek Formation thickness has not been determined. Its base is a distinct conglomerate marker and was very useful in the interpretation.

Hulcross Formation was estimated to have a thickness of 85 m. This thickness approximates the thickness drilled in Shikano Pit.

The upper Gates Formation - from the bottom of the Hulcross to the top of E seam - was estimated at 90 m. This is the distance between the upper "marker" bed drilled in QHR84019, 84029, 84030 and the top of E seam. This marker bed is considered to be the thin coal that is typically found immediately below the

Hulcross/Gates contact. Seam C is also identified in this upper Gates zone, approximately 26 to 32 m above E seam.

The middle Gates section, containing coal seams E, F, G, J and K, ranges up to 79 m in thickness.

The lower Gates section and Moosebar Formation have not been drilled but are expected to be typical (see Regional Geology for the Quintette area).

The General Stratigraphic correlation chart is presented in Appendix II-4. Table 3.5.2.1 summarizes the interseam lithologies and thicknesses.

TABLE 3.5.2.1

HERMANN SOUTH - INTERSEAM THICKNESSES AND LITHOLOGIES

Interseam	Thickness Range	Lithology
C to E	26-32	Claystones in the upper half to medium and coarse sandstones to +10 m of conglomerate (interpreted) above E seam
E to F	19 to 23	Fine to medium sandstones with minor siltstone and claystone
F to G	16 to 19	Siltstones to very fine sandstones - some medium and fine sands
G to J1	14 to 18	Very fine to medium sandstone with a siltstone/claystone zone 3 m below G seam
J1 to J3	0.8 to 2 m	Claystone to coally claystone
J3 to K	3 to 6 m	Coal to medium sandstone
Below K		Siltstone to medium sandstone - some very fine sands to carbonaceous claystones immediately below K

3.5.3 Structure

The major structure within Hermann South coal bearing units is interpreted as a chevron style syncline. This fold is a continuation of the Shikano syncline. Minor faulting has been interpreted on both limbs of the fold. The largest fault, on the southwest limb, is interpreted to have a drag fold on the overthrust plate. (This is from QHR84018 geophysical log interpretation.)

Dips from mapping range from 39° to 75° on the northeast limb and from 15° to 58° on the southwest limb. However, average dips used in the interpretation range from 42° to 53° on the northest limb and 31° and 40° on the southeast limb.

The sections, structure contour and geology plans are presented in Appendix II-4.

3.5.4 Coal Seam Development and Correlation

Correlation within Hermann South is excellent. Seams A, C, E, F, G, J, J3 and K are recognized. Table 3.5.4.1 summarizes the seam thicknesses from core logging and from corrected geophysical logs from rotary drill holes. A seam correlation chart is present in Apprendix II-4.

The uppermost seam A has been used for correlation, but appears (from geophysical log interpretation) to vary both in thicknesses and raw ash.

Seam C in Hermann South may be persistent and of good enough thickness and quality to be recoverable ranging in thickness from 1.32 m to 2.20 m. Since no D seam is recognized in the area, there is a possibility that this C seam is correlateable with D seams in the property.

Seam E is a thin seam with a significant proportion of rock partings. Its thickness ranges between 1.49 and 1.61 m although it may be thicker on the northeast limb of the syncline where it was in the overburdern of corehole QHD84004.

All analytical results are in Appendix 7.2. Table 2.5.1. identifies the sample intervals, component sample numbers and composite numbers. The intervals are also identified on the seam correlation chart in Appendix II-4.

TABLE 3.5.4.1

HERMANN SOUTH - SEAM THICKNESSES

Drill Hole	Seam	Thickness (m) (Coal/Coal + Rock)
QHD84004	F	3.04/3.59
	G	2.23/2.98
	J1	4.24/4.38
	J3	0.90/0.90
	K	0.58/0.58
QHR84018*	C	1.04/1.32
	E	1.00/1.49
	F	3.43/3.86
	G	2.73/3.53
	J1	5.27/5.67
	J3	1.14/1.21
	K	0.77/0.93
QHR84028*	C	1.77/2.20
	E	1.10/1.61
	F	3.07/3.95
	G	2.31/3.59
	J1	3.56/3.77
	J3	1.10/1.10
	K	0.51/0.51

* Thicknesses from corrected geophysical logs. Some thicknesses may be innaccurate due to unrecognized structural problems. (eg. F seam QHR84018)

3.6 DETAILED GEOLOGY - WATERFALL CREEK

3.6.1 Description

The Waterfall Creek area is accessed by the old Murray river road that follows the south bank of the river from Shikano Pit/Plant Site to a gas well just before Waterfall Creek. To open access to the area, the creek was forded and an old seismic line was opened (see the Geology Plan in Appendix II-5). The area is in the Murray River Valley, between elevations 780 m and 1100 m and is completely forest covered.

Previous drilling was conducted in 1973 (QBD7308, 7309). These drilling programs indicated the presence of coal in zones that are correlateable to Babcock. Due to the recognition of rapidly varying ash in some seams in the Murray River Valley area (Shikano Pit, J1 seam, and the presence of good mining sections to the southeast (Quintette Trend), and the favourable structure (open syncline), it was considered reasonable to conduct short rotary drill program to confirm the structure and test for the coal intersections. Therefore, seven rotary holes were drilled, four of which intersected coal. Geological mapping was also conducted on the west limb of the syncline.

The geology map, cross sections and structure contour are presented in Appendix II-5. The geophysical logs are in Appendix I and drill hole summary sheets in Appendix 4. Summary sheets for QBD7308 and 7308 are in Appendix 5.

3.6.2 Stratigraphy

Within the Waterfall Creek Syncline area, all formations from Gething to Shaftesbury have been mapped (see Geology plan and sections in Appendix II-5). The coal bearing Gates Formation has an estimated total thickness of 300 m.

The Shaftesbury Formation caps the syncline to the southeast and is of undetermined thickness.

The Boulder Creek Formation, made up of several resistant conglomeratic units, particularly at the top and base, is approximately 100 m thick.

The Hulcross Formation, with typical Hulcross lithologies, is estimated at 100 m thick.

The Upper Gates Formation, from the bottom of the Hulcross to the top of D seam, is 90 m thick. No drill hole in the area has completely penetrated this zone, however, the lower part, immediately above D seam, is sandstone to conglomerate.

The middle Gates Formation, from the top of D seam to the botton of J seam, contains D, E, F, I and J seams or zones. This zone is 105 to 125 m thick. The lithologies vary from coally and carbonaceous claystones to sandstones to conglomerates. Conglomerates are identified above I and E seams.

The lower Gates Formation, between J seam and the Moosebar Formation, is approximately 90 m thick and is typically a series of coarsening up sandstones. However, a very thick conglomeratic unit was drilled 35 m below J seam.

The Moosebar Formation, from geologic mapping, is approximately 110 m thick and caps an unknown thickness of Gething Formation.

The geophysical logs from the 1984 drilling are presented in Appendix I. These will assist in identifying interseam lithologies. For correlation purposes, the summary sheets for each drill hole, including the 1983 drill holes, are presented in Appendices 4 and 5.

Table 3.6.2.1 summarizes the interseam lithologies.

TABLE 3.6.2.1

WATERFALL CREEK - INTERSEAM THICKNESSES AND LITHOLOGIES

Interseam	Thickness Range	Lithology
Above D		Sandstone to conglomerate
D to E	38 - 43 m	Siltstone to sandstones to conglomerates with carbonaceous claystone near E seam
E to F	22 - 28 m	Claystone to very fine sandstone in lower portion
F to I	25 - 31 m	Channel sandstone/conglomerate below F with abundant carbonaceous and coally claystone to I seam
I to J	10 - 25 m	Claystones to fine sandstone - carbonaceous to coally.
Below J		Typical Gates coarsening up (to conglomerate) sequences. 2 m of carbonaceous claystones immediately below J

3.6.3 Structure

The dominent structure is a chevron style syncline with a major flexure on the east limb. See the geology plan, sections and structure contour in Appendix II-5.

The fold is the culmination of the Roman Mountain syncline, Waterfall Creek anticline and Quintette Trend dipslope (see Regional Geology plan in Appendix 2). Dips range from 33° to 67° on the southwest limb and from 3° to 80° on the northeast limb.

No faulting has been interpreted in the coal section, although small faults will occur near or along fold axes.

3.6.4 Coal Seam Development and Correlation

Correlation of the coal seams is not very easy due to the wide spacing of data points and very high ash and thin nature of all the seams. Correlation regionally is also suspect - for example, D seam could be equivalent to C seam elsewhere, and J seam could be equivalent to K seams.

However, for the purposes of this interpretation, seams D, E, F, I and J have been identified and correlated between the 1984 drilling and the 1973 drilling.

Seam D has three to four identifiable coal partings ranging in thickness from 0.34 to 0.89 m. It was intersected only in the 1973 drill holes.

Seam E has two to three identifiable coal partings ranging from 0.30 m to 2.53 m. The thick E2 seam appears relatively persistent, however, it was not well developed in QBR84012.

Seam F consists of three to four coal partings, ranging in thickness from 0.26 m to 2.29 m. Some of the partings are close enough to each other to be considered a single thicker seam. This, of course, will increase the ash content.

TABLE 3.6.4.1

WATERFALL CREEK - SEAM THICKNESSES

Drill Hole	Seam	Thickness (m)
QBD7308	D2	0.89
	E2	1.95
	F1	2.07
	F2	0.82
	F3	0.73
	I1	1.15
	I2	1.28
	J2	2.10
QBD7309	D2	0.73
	E1	0.61
	E2	2.53
	F1	2.29
	F2	0.91
	F3	0.85
	I1	0.84
	I2	0.89
	J1	0.51
	J2	1.52
QBR84008	I1	0.71
	I2	1.35
	J2	1.64
QBR84012	E2	0.59
	F1	0.78
	F3	0.93
	F4	0.56
	I2	1.03
	J	0.94
QBR84013	F1	0.79
	F2	0.63
	F3/F4	1.35
	I1/I2	2.26
	J	1.22
QBR84014	E2	2.04
	F1	0.94
	F2	1.03
	F4	0.77
	I1/I2	1.83
	J2	1.75

Minimum Total Mining Thickness = 5.97 m
Maximum Total Mining Thickness = 12.61 m

APPENDIX 1

LEGAL DESCRIPTION OF THE QUINTETTE COAL LICENCES

APPENDIX 1.
LEGAL DESCRIPTION OF THE
QUINTETTE COAL LICENCES

Licence No.	Date Issued	Series	Block	Units	Paying Hectares
3633	May 27/75	93-P-3	C	63, 64, 73, 74	297
3632	May 27/75	93-P-3	C	47, 48, 57, 58	297
3631	May 27/75	93-P-3	C	25	75
3630	May 27/75	93-P-3	C	23, 33	149
3629	May 27/75	93-P-3	C	21, 22, 31, 32	298
3628	May 27/75	93-P-3	C	15	75
3627	May 27/75	93-P-3	C	3, 4, 13, 14	298
3236	May 27/75	93-P-3	C	11, 12	149
3625*	May 27/75	93-P-3	B	49, 50	149
3624*	May 27/75	93-P-3	B	29, 30, 39, 40	298
3623*	May 27/75	93-P-3	B	27, 28, 37, 38	298
3622*	May 27/75	93-P-3	B	25, 26, 35, 36	298
3621*	May 27/75	93-P-3	B	9, 10, 19, 20	298
3620*	May 27/75	93-P-3	B	7, 8, 17, 18	298
3619*	May 27/75	93-P-3	B	5, 6, 15, 16	298
3618	May 27/75	93-P-3	B	3, 4, 13, 14	298
3606	Apr 29/75	93-P-3	F	25, 35	149
3605	Apr 29/75	93-P-3	F	23, 24, 33, 34	297
3604	Apr 29/75	93-P-3	F	21, 22, 31, 32	297
3603	Apr 29/75	93-P-3	F	5, 6, 15, 16	297
3602	Apr 29/75	93-P-3	F	3, 4, 13, 14	297
3601	Apr 29/75	93-P-3	F	1, 2, 11, 12	297
3600	Apr 29/75	93-P-3	G	9, 10, 19, 20	297
3599	Apr 29/75	93-P-3	G	8, 18	149
3598	Apr 29/75	93-P-3	C	83, 84, 93, 94	297
3597	Apr 29/75	93-P-3	C	81, 82, 91, 92	297
3596	Apr 29/75	93-P-3	B	100	75
3595	Apr 29/75	93-P-3	B	87, 88, 97	223
3594	Apr 29/75	93-P-3	B	69, 79	149
3593	Apr 29/75	93-P-3	B	67, 68, 77, 78	297
3592	Apr 29/75	93-P-3	B	66, 76	149
3406	Feb 1/75	93-P-3	F	7, 17	149
3405	Feb 1/75	93-P-3	D	83, 84, 93, 94	297
3404	Feb 1/75	93-P-3	D	81, 82, 91, 92	297
3403	Feb 1/75	93-P-3	D	73, 74	149
3402	Feb 1/75	93-P-3	D	61, 71, 72	223
3401	Feb 1/75	93-P-3	C	89, 90, 99, 100	297
3400	Feb 1/75	93-P-3	C	87, 88, 97, 98	297
3399	Feb 1/75	93-P-3	C	85, 86, 95, 96	297
3398	Feb 1/75	93-P-3	C	69, 70, 79, 80	297
3397	Feb 1/75	93-P-3	C	67, 68, 77, 78	297
3396	Feb 1/75	93-P-3	C	65, 66, 75, 76	297
3395	Feb 1/75	93-P-3	C	49, 59, 60	223

Licence No.	Date Issued	Series	Block	Units	Paying Hectares
3394	Nov 25/74	93-P-3	F	89, 99	149
3393	Nov 25/74	93-P-3	F	87, 88, 97, 98	296
3392	Nov 25/74	93-P-3	F	86	75
3391	Nov 25/75	93-P-3	F	67, 68, 77, 78	297
3390	Nov 25/74	93-P-3	F	65, 66, 75, 76	297
3389	Nov 25/74	93-P-3	F	63, 64, 74	223
3388	Nov 25/74	93-P-3	F	45, 46, 55, 56	297
3387	Nov 25/74	93-P-3	F	43, 44, 53, 54	297
3386	Nov 25/74	93-P-3	F	41, 42, 51, 52	297
3385	Nov 25/74	93-P-3	G	50	75
3384	Nov 25/74	93-P-3	G	29, 30, 39, 40	297
3383	Nov 25/74	93-P-3	G	27, 28	149
3382	Nov 25/74	93-P-3	B	86, 95, 96	223
3381	Nov 25/74	93-P-3	C	71, 72	149
3380	Nov 25/74	93-I-14	J	51, 52	149
3379*	Nov 25/74	93-I-15	L	69, 70	149
3378*	Nov 25/74	93-I-15	L	9, 10, 19, 20	298
3377*	Nov 25/74	93-I-15	L	7, 8, 17, 18	298
3376*	Nov 25/74	93-I-15	L	3, 4, 13, 14	298
3375	Nov 25/74	93-I-15	L	1, 2, 11, 12	298
3374	Nov 25/74	93-I-15	E	85, 86, 95, 96	298
3373	Nov 25/74	93-I-15	E	83, 84, 93, 94	298
3372	Nov 25/74	93-I-15	E	81, 82, 91, 92	298
3371	Nov 25/74	93-I-15	E	63, 64, 73, 74	298
3370	Nov 25/74	93-I-15	E	61, 62, 71, 72	298
3369	Nov 25/74	93-I-15	D	90, 100	150
3368	Nov 25/74	93-I-15	D	80	75
3367	Nov 25/74	93-I-14	G	83, 84, 93, 94	298
3366	Nov 25/74	93-I-14	A	81, 82, 91, 92	299
3365	Oct 16/74	93-I-15	E	30	75
3364	Oct 16/74	93-I-15	E	9, 10, 19, 20	299
3363	Oct 16/74	93-I-15	E	8	75
3362	Oct 16/74	93-I-14	J	5, 15	149
3361	Oct 16/74	93-I-14	J	3, 4, 13, 14	298
3360	Oct 16/74	93-I-14	H	69, 70, 79, 80	298
3359	Oct 16/74	93-I-14	H	67, 68, 77, 78	298
3358	Oct 16/74	93-I-14	H	65, 66	149
3357	Oct 16/74	93-I-14	H	49, 59, 60	224
3356	Oct 16/74	93-I-14	H	47, 48, 57, 58	298
3355	Oct 16/74	93-I-14	H	45, 46, 55, 56	298
3354	Oct 16/74	93-I-14	H	43, 44, 53, 54	298
3353	Oct 16/74	93-I-14	H	37, 38	149
3352	Oct 16/74	93-I-14	H	25, 26, 35, 36	299

10,130

Licence No.	Date Issued	Series	Block	Units	Paying Hectares
3351	Oct 16/74	93-I-14	K	83, 93, 94	223
3350	Oct 16/74	93-I-14	K	81, 82, 92	223
3349	Oct 16/74	93-I-14	K	71	75
3348*	Oct 16/74	93-I-14	J	90	75
3347*	Oct 16/74	93-I-14	J	95, 96	149
3346	Oct 16/74	93-I-14	J	83, 84, 93, 94	298
3345	Oct 16/74	93-I-14	J	69, 70, 79, 80	298
3344	Oct 16/74	93-I-14	J	63, 73, 74	223
3343	Oct 16/74	93-I-14	J	61, 62, 71, 72	298
3342	Oct 16/74	93-I-14	J	21, 31	149
3341	Oct 16/74	93-I-14	I	89, 99	149
3340	Oct 16/74	93-I-14	I	87, 88, 98	223
3339	Oct 16/74	93-I-14	I	85, 86, 95	223
3338*	Oct 16/74	93-I-14	I	94	75
3337*	Oct 16/74	93-I-14	I	82	75
3336	Oct 16/74	93-I-14	I	69, 70, 79, 80	298
3335	Oct 16/74	93-I-14	I	67, 68, 77, 78	298
3334*	Oct 16/74	93-I-14	I	65, 66, 75, 76	298
3333*	Oct 16/74	93-I-14	I	63, 64, 73, 74	298
3332*	Oct 16/74	93-I-14	I	61, 62, 71, 72	298
3331*	Oct 16/74	93-I-14	I	49, 50, 59, 60	298
3330*	Oct 16/74	93-I-14	I	47, 48, 57, 58	298
3329*	Oct 16/74	93-I-14	I	45, 46, 55, 56	298
3328*	Oct 16/74	93-I-14	I	43, 44, 53, 54	298
3327*	Oct 16/74	93-I-14	I	41, 42, 51, 52	298
3326	Oct 16/74	93-I-14	I	29, 30, 39, 40	298
3325	Oct 16/74	93-I-14	I	27, 28, 37, 38	298
3324	Oct 16/74	93-I-14	I	25, 26, 35, 36	298
3323*	Oct 16/74	93-I-14	I	23, 24, 33, 34	298
3322*	Oct 16/74	93-I-14	I	21, 22, 31, 32	298
3321	Oct 16/74	93-I-14	I	19	75
3320	Oct 16/74	93-I-14	I	7, 8, 17, 18	298
3319	Oct 16/74	93-I-14	I	5, 6, 15, 16	298
3318*	Oct 16/74	93-I-14	I	3, 4, 13, 14	298
3317*	Oct 16/74	93-I-14	I	1, 2, 11, 12	298
3316	Oct 16/74	93-I-14	H	85, 86, 95, 96	298
3315	Oct 16/74	93-I-14	H	83, 84, 93, 94	298
3314	Oct 16/74	93-I-14	H	81, 82, 91, 92	298
3313	Oct 16/74	93-I-14	H	73	75
3312	Oct 16/74	93-I-14	H	61, 62, 71, 72	298
3311*	Oct 16/74	93-I-15	L	49, 50, 59, 60	298
3310*	Oct 16/74	93-I-15	L	47, 48	149
3309*	Oct 16/74	93-I-15	L	29, 30, 39, 40	298

10505

Licence No.	Date Issued	Series	Block	Units	Paying Hectares
3308*	Oct 16/74	93-I-15	L	27, 28, 37, 38	298
3307*	Oct 16/74	93-I-15	L	25, 26, 35, 36	298
3306*	Oct 16/74	93-I-15	L	23, 24	149
3305*	Oct 16/74	93-I-15	L	5, 6, 15, 16	298
3304	Oct 16/74	93-I-15	E	89, 90, 99, 100	298
3303	Oct 16/74	93-I-15	E	87, 88, 97, 98	298
3302	Oct 16/74	93-I-15	E	69, 70, 79, 80	298
3301	Oct 16/74	93-I-15	E	67, 68, 77, 78	298
3300	Oct 16/74	93-I-15	E	65, 66, 75, 76	298
3299	Oct 16/74	93-I-15	E	59, 60	149
3298	Oct 16/74	93-I-15	E	47, 48, 57, 58	298
3297	Oct 16/74	93-I-15	E	45, 46, 55, 56	298
3296	Oct 16/74	93-I-15	E	43, 44, 53, 54	298
3295	Oct 16/74	93-I-15	E	41, 42, 51, 52	298
3294	Oct 16/74	93-I-15	E	37	75
3293	Oct 16/74	93-I-15	E	25, 26, 35, 36	299
3292	Oct 16/74	93-I-15	E	23, 24, 33, 34	299
3291	Oct 16/74	93-I-15	E	21, 22, 31, 32	299
3290	Oct 16/74	93-I-15	E	3, 4, 13, 14	299
3289	Oct 16/74	93-I-15	E	1, 2, 11, 12	299
3288	Oct 16/74	93-I-15	F	49, 50, 59, 60	298
3287	Oct 16/74	93-1-15	F	48	75
3286	Oct 16/74	93-I-15	F	29, 30, 39, 40	299
3285	Oct 16/74	93-I-15	F	27, 28, 37, 38	299
3284	Oct 16/74	93-I-15	F	25, 26	150
3283	Oct 16/74	93-I-15	F	9, 10, 19, 20	299
3282	Oct 16/74	93-I-15	F	7, 8, 17, 18	299
3281	Oct 16/74	93-I-15	F	5, 6, 15, 16	299
3280	Oct 16/74	93-I-15	F	3, 4, 13, 14	299
3279	Oct 16/74	93-I-15	F	2	75
3662	Sep 27/76	93-I-14	J	81, 82, 91, 92	298
3661	Sep 27/76	93-I-14	I	90, 100	149
3660	Sep 17/76	93-P-3	B	1, 2, 11, 12	298
3659*	Aug 9/76	93-P-3	B	59, 60	149
3658*	Aug 9/76	93-P-3	B	47, 48, 57, 58	297
3657*	Aug 9/76	93-I-14	J	89, 99, 100	223
3656*	Aug 9/76	93-I-14	J	87, 88, 97, 98	298
4530*	Jan 15/79	93-P-3	B	23, 24, 33, 34	297
4531*	Jan 15/79	93-P-3	B	45, 46, 55, 56	297
4532	Jan 15/79	93-P-3	B	70, 80	149
4533	Jan 15/79	93-P-3	B	98	75

10366

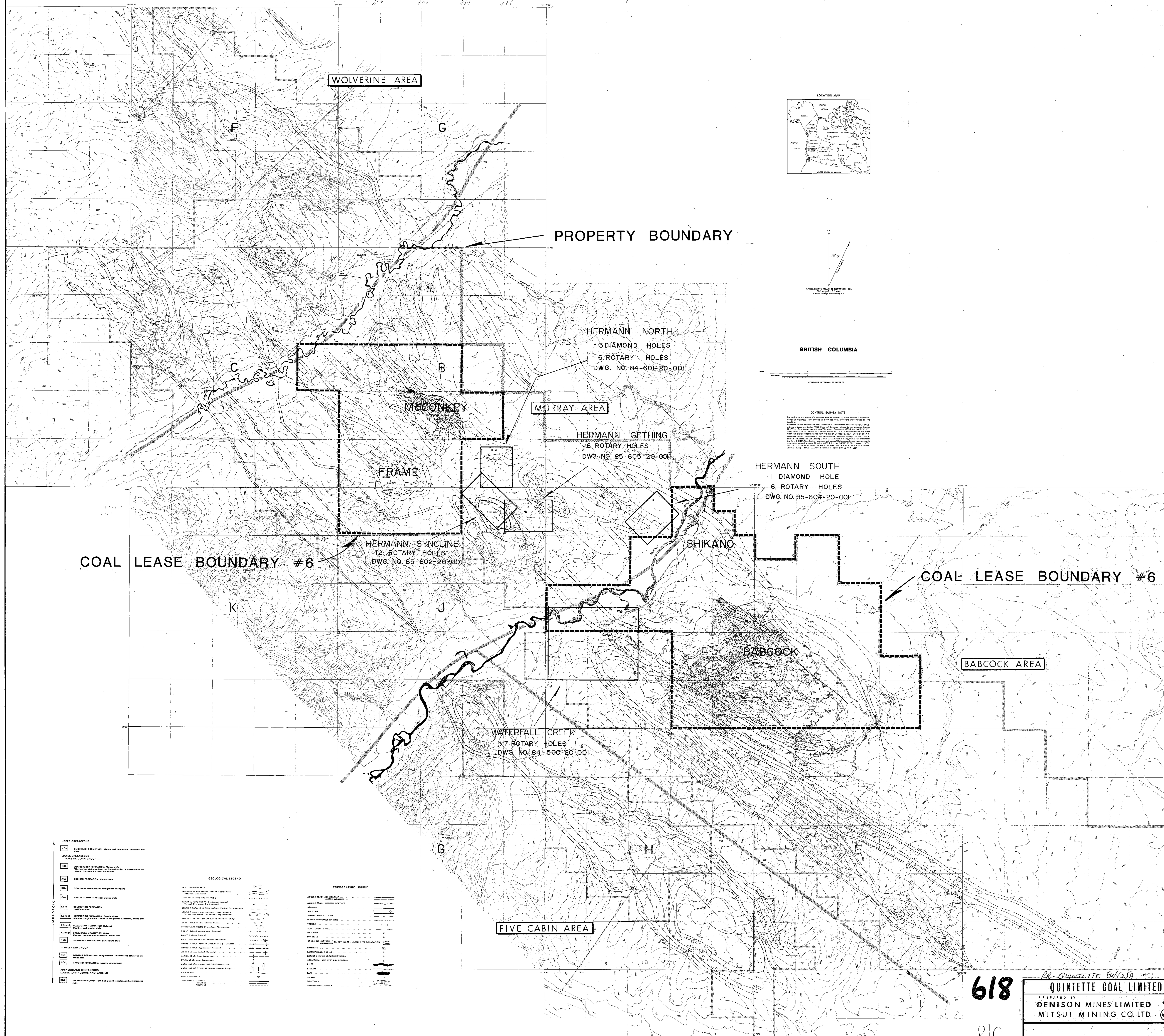
Licence No.	Date Issued	Series	Block	Units	Paying Hectares
4534	Jan 15/79	93-P-3	B	89, 90, 99	223
4535	Jan 15/79	93-P-3	C	1, 2	149
4536	Jan 15/79	93-P-3	C	24, 34	149
4537	Jan 15/79	93-P-3	C	26, 35, 36	223
4538	Jan 15/79	93-P-3	C	27, 28, 37, 38	297
4539*	Jan 15/79	93-P-3	C	41, 42, 51, 52	297
4540	Jan 15/79	93-P-3	C	43, 44, 53, 54	297
4541	Jan 15/79	93-P-3	C	45, 46, 55, 56	297
4542	Jan 15/79	93-P-3	C	61, 62	149
4543*	Jan 15/79	93-I-14	J	85, 86	149
4544	Jan 15/79	93-I-14	K	91	75
4755*	Apr 20/79	93-I-15	L	45, 46, 55, 56	298
4756*	Apr 20/79	93-I-15	L	57, 58	149
4757*	Apr 20/79	93-I-15	L	67, 68, 77, 78	298
6039*	Jan 15/79	93-I-14	I	83, 84, 93	223
7221	Sep 18/81	93-I-15	K	9, 10, 19, 20	298
7222	Sep 18/81	93-I-15	F	89, 90, 99, 100	298
7223	Sep 18/81	93-I-15	F	87, 88, 97, 98	298
7224	Sep 18/81	93-I-15	F	69, 70, 79, 80	298
7225	Sep 18/81	93-I-15	F	78, 77, 68, 67	298
7226	Sep 18/81	93-I-15	F	76, 75, 66, 65	298
7227	Sep 18/81	93-I-15	F	57, 58, 47	224
7228	Sep 18/81	93-I-15	F	55, 56, 45, 46	298
7229	Sep 18/81	93-I-15	F	53, 54, 43, 44	298
7230	Sep 18/81	93-I-15	F	41, 42, 51, 52	298
7231	Sep 18/81	93-I-15	F	35, 36	149
7232	Sep 18/81	93-I-15	F	33, 34, 23, 24	298
7233	Sep 18/81	93-I-15	F	31, 32, 21, 22	298
7234	Sep 18/81	93-I-15	F	11, 12, 1	224
7235	Sep 18/81	93-I-15	G	39, 40, 29, 30	298
7236	Sep 18/81	93-I-15	G	19, 20, 9, 10	299
7237	Sep 18/81	93-I-15	G	7, 8, 17, 18	299
7845	Aug /84	93-I-14	I	96	75
7846	Aug /84	93-I-14	I	97	75
7847	Aug /84	93-P-3	A	5, 6, 15, 16	300
7848	Aug /84	93-P-3	A	7, 8, 17, 18	300
7849	Aug /84	93-P-3	A	9, 10, 19, 20	300
7850	Aug /84	93-P-3	B	21, 22, 31, 32	300
7851	Aug /84	93-P-3	B	43, 44, 53, 54	300
7852	Aug /84	93-P-3	B	65, 75	150
7853	Aug /84	93-P-3	B	85	75

* Licences marked with an asterisk have been converted to Coal Lease #6 in July, 1982.

9919

APPENDIX 2

REGIONAL GEOLOGY MAP; 1:50000



618

PR-QUINTETTE 84(2)A #(1)

QUINTETTE COAL LIMITED

PREPARED BY:
DENISON MINES LIMITED
MITSUI MINING CO. LTD.

PIC

REGIONAL GEOLOGY MAP
1984 GEOLOGICAL EXPLORATION

DRAWN BY: E. Toth	DATE: Feb. '77	SCALE: 1:50,000
PREP'D BY:	DATE:	DRAWING NUMBER:
APPR'D BY: H.P. G.P.C.	DATE: Feb. '78	QNTT 71-0100-R17