CONFIDENTIAL

ZYMOETZ RIVER GEOLOGICAL REPORT

NTS MAP SHEET:

LATITUDE/LONGITUDE:

COAL LICENCES:

HELD BY:

OPERATED BY:

EXPLORATION PERIOD:

REPORT DATE:

PROJECT GEOLOGIST:

GEOLOGIST:

GEOLOGICAL TECHNOLOGIST:

93L/13

54° 30'/127° 45'

Group 322

4252, 4253, 4254, 4255, 4257

6172 and 6173

SHELL CANADA RESOURCES LIMITED

CROWS NEST RESOURCES LIMITED

AUGUST 1983

MAY 1984

DAVE HANDY

STEVE CAMERON

JIM EISENMAN

GEOLOGICAL BRANCH ASSESSMENT REPORT

00 247

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March 23, 1984

Ministry of Energy, Mines & Petroleum Resources 617 Government Street Victoria, B.C. V8V 1X4

Attention: Mr. P. Hagen

Coal Administrator

Dear Sir:

Enclosed please find our report on the Zymoetz Project.

This report has been prepared by Mr. D. Handy and Mr. S. Cameron, both of whom are employed by Crows Nest Resources Limited as geologists.

Mr. D. Handy, Honours B.Sc., graduated in Geology from the University of Waterloo in 1977. Prior to his graduation, Mr. Handy worked as an assistant for two geotechnical companies and after graduation as a geologist for a major company in Saskatchewan. Mr. Handy has been employed by Crows Nest Resources Limited as a Project Geologist since 1979.

Mr. S.Cameron,B.Sc., in Geology graduated from the University of Calgary in 1981. Prior to graduation Mr. Cameron worked as an assistant for a major exploration company in the North West Territories. He also worked for Crows Nest Resources Limited as a geological assistant in 1980. Mr. Cameron has been employed by Crows Nest Resources Limited as a Geologist since May 1981.

In my opinion, all of these personnel are fully qualified, by training and experience to prepare this report and this account of work done under their direct supervision.

Yours very truly,

H.G. Rushton

Vice President - Development

Enclosure

LIST OF ENCLOSURES

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1.0 SUMMARY

The Zymoetz River Coal Project is contained within 7 coal licences. These licences are held by Shell Canada Resources Ltd. and operated by Crows Nest Resources Ltd.

The 1983 drilling program included the preparation of one drill site and drilling one NQ diamond drill hole to a depth of 295.0 metres. The coordinates of the drill hole were located by air photos. There were no intersections of coal in the drill hole. The total expenditure for 1983 was \$41,391.00. All of this amount is being applied to the coal licences covered by this report.

2.0 INTRODUCTION

2.1 LOCATION

Enclosure 1 - Location and Index Map

The property is located at the confluence of the Zymoetz River and Coal Creek.

N. Lat. 54° 30'

W. Long. 127° 45'

2.2 TENURE

The Zymoetz River licences are contained in group number 322. The coal licence numbers included in this group are 4252, 4253, 4254, 4255, 4257, 6172 and 6173.

3.0 REGIONAL GEOLOGY

Mesozoic successor basins developed in the Intermontane Belt between the Columbian and Pacific Orogens in the B.C. Cordillera. These deeply subsiding troughs usually had both marine and fresh water depositional environments. Fresh water lakes could have developed in areas of poor drainage and provided sites for thick peat accumulation. Coal-bearing clastic sequences also accumulated in areas of dip-slip and strike-slip faulting in the troughs.

The Skeena Group successor basin is filled with interbedded marine and non-marine sedimentary and volcanic strata. This assemblage was deposited on the folded and faulted terrane of the Bowser Lake and older groups such as the Hazelton. Sediments of the Skeena Group are distinguishable from the Bowser Lake and Hazelton sediments by the presence of fine detrital muscovite. "In the Late Jurassic to Early Cretaceous, prior to deposition of the Skeena Group sediments, the Hazelton Group underwent a period of uplift, deformation and erosion. During the Mid Early Cretaceous, the sea readvanced from the west, in the area of Skeena Valley, inundating the non-marine, Late Lower Cretaceous coal basins such as Telkwa and Lake Kathlyn. The sediments of the Skeena Group were derived from an uplifted Pinchi-belt - Columbian Orogen. They were deposited in a southwesterly direction, across the Skeena Arch, which apparently had little influence on the shape of the basin receiving the Skeena Clastics."

1. Tipper H.W. and Richards T.A., Jurassic Stratigraphy and History of North Central British Columbia, 1976, page 7.

4.0 ZYMOETZ GEOLOGY

4.1 STRATIGRAPHY

The basement rocks of the Zymoetz property consist of Upper Jurrassic/Lower Cretaceous volcanics of the Hazelton Group. These volcanics consist of basalt, andesite, trachyte, ryolite and agglomerate.

The volcanics are unconformably overlain by Cretaceous sediments of the Skeena group. These sediments are composed of conglomerate, sandstone, siltstone, shale, mudstone, coal and minor lava flows. Younger intrusives in the form of dykes, sills and stocks are often present. The intrusives are frequently oriented parallel to joints.

The Skeena sedimentary section at Zymoetz River varies in thickness but probably does not exceed 300 metres. Individual coal seams vary in thickness and may pinch out over relatively sort distances making correlation difficult. A basal conglomerate often overlies the basement volcanics.

On the Zymoetz River property, at least five coal seams are present. In the area of Coal Creek aggregate coal thickness range from 4 metres to 8 metres. These seams are near the base of the Skeena section. Drill hole 301 explored the upper to middle part of the Skeena section between Coal Creek and Sandstone Creek, however, no coal was intersected.

4.2 STRUCTURE

In the Coal Creek area of the Zymoetz property, the sedimentary section dips to the northwest at an average of 25°. Only minor normal faults have been encountered in this area. The outcrop pattern of the Hazelton volcanics in the center of the property indicates a possible anticlinal structure. This would indicate the possibility that the coal measures at the base of the Skeena section may also be present southeast of the volcanic outcrop.

5.0 SUMMARY OF PREVIOUS WORK

Work done in 1979

- . 1:10 000 scale geological mapping
- . Diamond drilling (two holes)
- Location survey of diamond drill holes
- . Drill site reclamation

No exploration work was performed in 1980.

Work done in 1981

- . 1:10 000 scale geological mapping
- . Additional reclamation of 1979 drill sites

No exploration work was performed in 1982.

6.0 <u>WORK DONE IN 1983</u>

- . One diamond drill hole
- Drill site reclamation

7.0 MINEABILITY

On the Zymoetz property five seams can be correlated over a distance of at least half a kilometer, with an aggregate thickness between 4 and 8 metres. Feasible open pit mining on the Zymoetz property appears to be limited because the coal seams are dipping at an average of 25° into the topography. However, the northwest part of the property is relatively unexplored. Also, the area east of Coal Creek may have some coal resources. No accurate reserve calculations have been done to date but mineable in place reserves probably do not exceed 5 million tonnes.

8.0 COAL QUALITY

No coal was intersected in drill hole ZZ-83D-301. See the 1981 report entitled "Smithers Area Coal Prospects" for quality information.

9.0 References

Dowling, D.B.

1915:

Coal Fields of British Columbia, Canada Dept. of Mines, No. 57, Geological Series, pp. 167-189.

Eisbacher, G.H.

1974:

Evolution of Successor Basins in the Canadian Cordillera, Society of Economic Paleontologists and Mineralogists, Special Publication 19.

Eisbacher, G.H.

1981:

Late Mesozoic - Paleogene Bowser Basin Molasse and Cordilleran Tectonics, Western Canada, Geol. Assoc. Canada, Special Paper #23.

Handy, D.L.

1979:

Geological Report - Smithers Area Coal Prospects Crows Nest Resources Limited

Handy, D.L. and

Cameron, S.J.

Geological Report - Smithers Area Coal Prospects

1981: Crows Nest Resources Limited

Koo, J and

Matheson, A. 1983:

Economic Coal Potential of the Southern Bowser Basin in West Central British Columbia, CIM

District 6 Meeting, Smithers B.C., Paper No. 22.

Long, D.G.F.

1981:

Dextral Strike Slip Faults in the Canadian Cordillera and Depositional Environments of Related Fresh-Water Intermontane Coal Basins, Geol. Assoc. Canada, Special

Paper #23.

Tipper, H.W. and

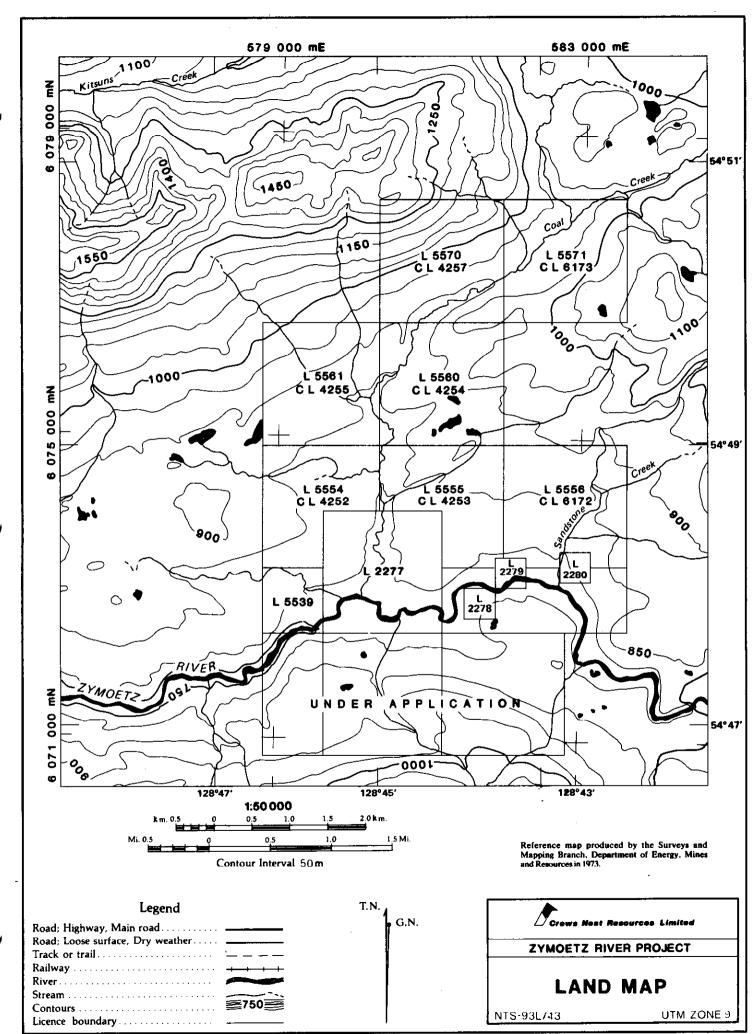
Richards, T.A.

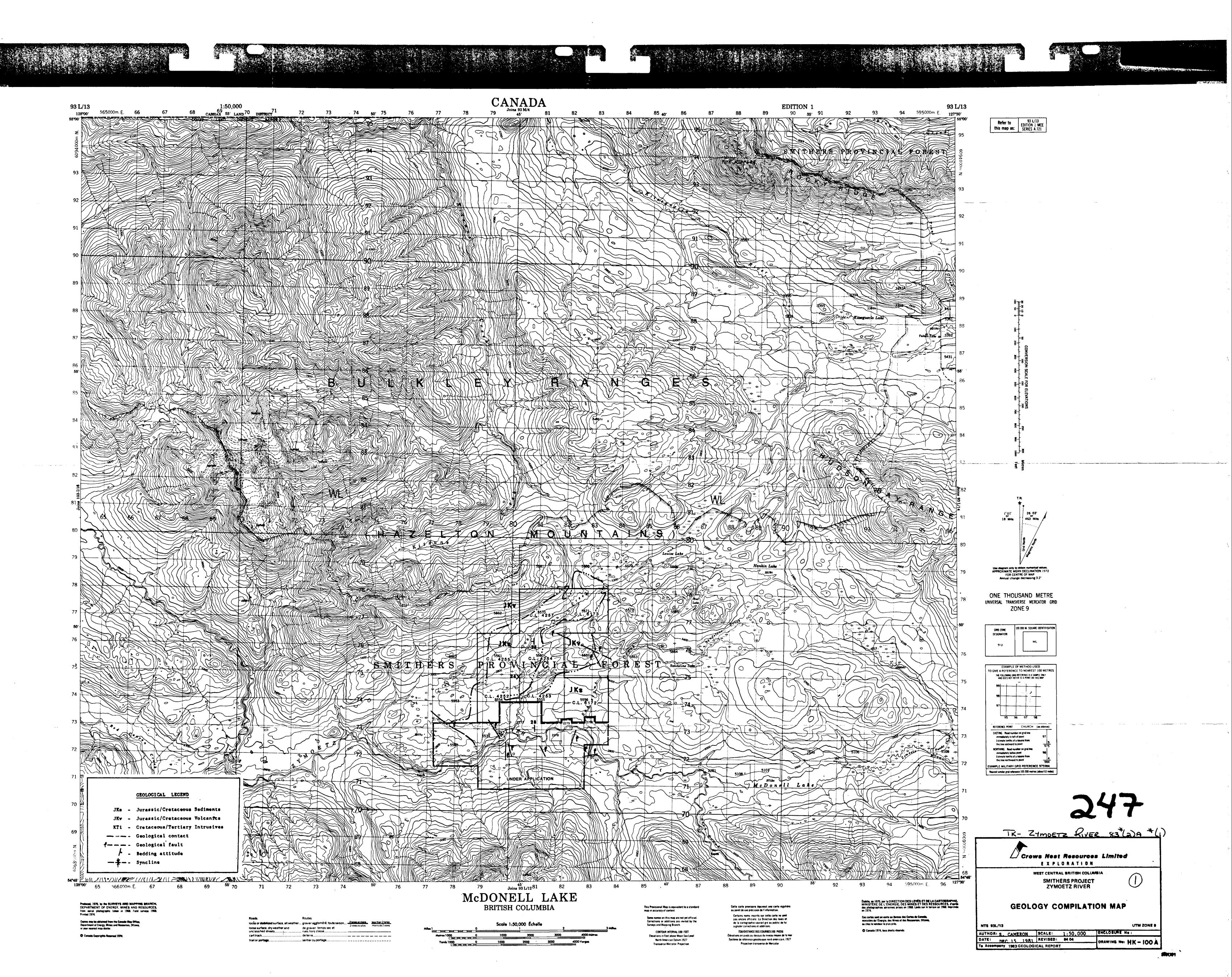
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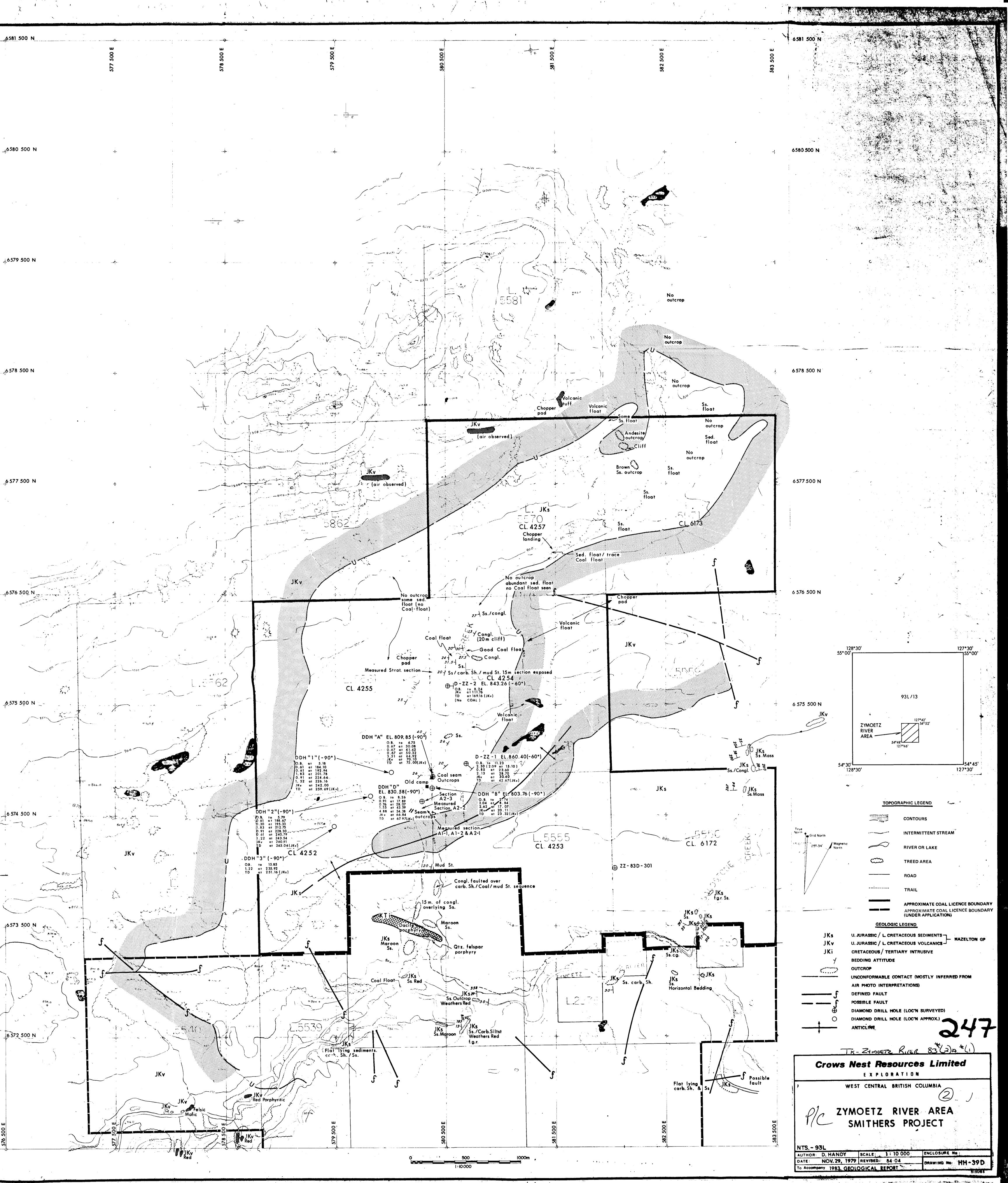
Jurassic Stratigraphy and History of North Central British Columbia, Geol. Surv. Canada, Bulletin 270.

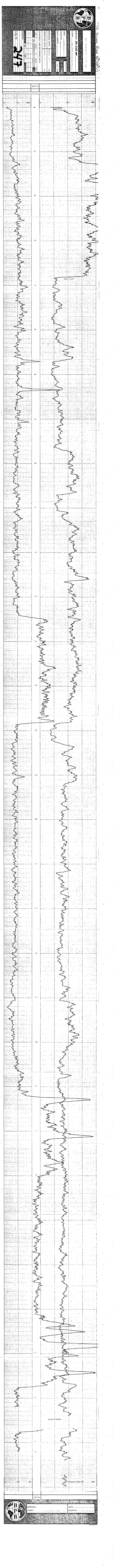
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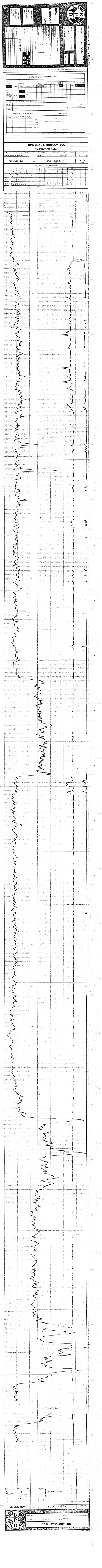












CORE & COAL CORE DESCRIPTION

LOCATION

ELEVATION

HOLE BEARING (AZ*)

TOTAL DEPTH

HOLE ANGLE (*)* -90°

PROJECT	ZYMOETZ RIVER	Γ
AREA	SMITHERS, B.C.	1
LOGGING		0

BEGIN END

HOLE No.

ZZ-301 PAGE...! ...

GING COAL CORING PERFORMANCE

LOGS RUN
LOGGED BY BPB
OTHER
TESTS

CORE DIAMETER NO.

CORE RECOVERED

LENGTH CORED

CORE RECOVERY %

EXAMINATION

LOG USED LSD, BRD

No. OF SEAMS SAMPLED

EXAMINER (\$) D. Handy

DATE Aug.30/83

BOX DI	EPTH	PTH DEPTH				LITHO DESCRIPTION			SUMM/	ARY GE	OTECH		ANALYTICAL DATA							
I 1	r tor			TH.		The second secon	DEAM DESIG	SEDDING ANGLE	HARD- NESS	FRAC.	ean.	SAMPLE NO.		ST %	ASH %			F.S.I.	C:V.	
No.	Ю×	FROM	10		MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)							ar.b.	residual	7917 /6	V.M. /6	7.0.7	r.J.I,	C.V.	
14		0.00	12.20	12.20	OB.				depti											
┡									<u> </u>	<u> </u>										
\vdash		12.20	16.28	4.08	551	Medium grey to white sandstone some very fine	L	<u> </u>		<u> </u>			<u> </u>							
 			 		<u> </u>	grained sections, poorly bedded	ļ	<u> </u> -					<u> </u>	ļ						
⊢⊢							<u> </u>		<u> </u>	<u> </u>	<u> </u>		├─-							
┝╼┼╸		16.28	16.60	1.0.3	SLST	Purple - Massive, hard, grades into sandstone below		├		├	 -		 -	 						
 		<u> </u>	 		 	Delow		 -	 		 		 	 						
\vdash		16 60	28.94	12 3	CICT	SS1. Dark grey siltstone with thin interbedded		560	17.80	 	 		 	├──						
		10.00	20.34	112.3	3131	fine grained sandstone, numerous inconstone	 	130	17.00	1-	 		 -	 		-				
 		 	 	 		i nodules.	1	 	 	1	 		 	 	 				 	
						Fairly massive siltstone, some sandstone layers	 	530	25.00	<u> </u>	 									
						show well developed bedding as well as biotur-	\vdash	510	27.60	d	†			 						
						bation structures, healed micro faults, slump						<u> </u>				<u> </u>				
						faults.														
			L				Ì													
		28.94	50.90	21.9	SLST	MDST, IRST, CARBONACEOUS														
\vdash		<u> </u>	<u> </u>	<u> </u>	<u> </u>	Dark grey siltstone light grey ironstone	<u> </u>	65°	29.0	q p	├				<u> </u>			-		
				<u> </u>	ļ	interbedded siltstone occasionally grades to	!		L		├		 	ļ	ļ	ļ		<u> </u>	 	
		ļ		1	ļ	mudstone or carbonaceous mudstone	ļ	159°	35.00	q	├	<u> </u>	 	 	ļ	 		<u> </u>	ļ	
\vdash			 -	 	 	Ironstone consists of nodules and layers parall	 	 			 		┼—-	 	!		<u> </u>	 	—	
 -		<u> </u>	 	· 	ļ	ing bedding	╄		10.2		╁┈╼┈		ļ <u>.</u>	 	<u> </u>	 		 	├──	
\vdash		ļ	 -	 	├ ──	Abundant slump structures, healed micro faults	 	154 <u>°</u>	45.5	Ч—	 	ļ	 	 	 	 	-	 	ļ	
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		T		1	1	- thin carbonaceous layers parallel bedding and	1			1		1		— —	i	·	1	<u> </u>		
			I		T	appear wispy		T		\top	T		1						1	
			I			- micro faults common				T			1		Τ-				1	
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		58.96	76.50	17.5	4 SLST	IRST_SS1		-				1								
		.	ļ	┸		Dark grey, fairly massive siltstone with		↓	 	4	 	ļ			1		ļ			
		ļ.,	 	<u> </u>	 	abundant ironstone nodules, occasionally grades	╄	4—	4	₩	4	 	ļ			ļ	<u> </u>		↓	
1		 	↓	_	 	to fine grained sandstone	╀	↓ —	 	+-	 	ļ				1	<u> </u>	1	 	
		 	├	<u> </u>	↓	abundant calcite filled fractures	4—	+	 	+-	╁	1	 	4	 			╄		
		<u> </u>	<u> </u>	<u> </u>	<u> </u>	poorly developed bedding	1	1	1		_1					1	L	1_	J	

ALL LINEAR UNITS IN METRES

A ANGLE MEASURED FROM CORE AXIS

HOLE No. 72-301

^{# :} MEASURED FROM THE HORIZONTAL PLANE

^{* : *} R &/OR 5 - GOLDER ASSOCIATES MARDNESS CODE

[•] RQD - ROCK QUALITY DESIGNATION (%)

FF ---- FRACTURE FREQUENCY

CORE & COAL CORE DESCRIPTION

PROJECT	ZYMOETZ HOLE N	PAGE 2
AREA	SMITHERS, B.C. CONTINUED	 OF4

BOX D	EPTH T TOP	DEF	PTH			LITHO DESCRIPTION	SEAM	A BEDOING	SUMM	ARY GE	OTECH				ANALY	TICAL	DATA		
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		76.50	76.82	0.32	IRST	Brownish grey, massive, vuggy with calcite,	_	45°	76.8	 -					-				
 						carbonaceous contact with lower unit													
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 		/0.82	77.15	0.33	CUNG.	Medium grey, SS1-SS2 matrix, pebble clasts of up to 5cm diameter.	<u> </u>	<u> </u>	<u> </u>	<u> </u>	L								
 						to sem diameter.		 	! -	<u> </u>				 -					
		77.15	81.02	3.87	SS1	Clean, tan coloured, massive SSI 1.5m stick mino	<u> </u>	400	78,5	<u> </u>	-								
						carbonaceous wisps parallel bedding		10	10,5	1				 -					
								1-					·	-					
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						Dark grey SLST clasts up to 4 or 5 cm				<u> </u>									
 -		81 15	85.05	3 00	<u>ce1</u>	Clean SS1 as above, stick, minor SS3 interbedded		600	84.9	<u> </u>				 					
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						1.000	 	┼──	 	_	_	-	 	 					
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 -		85.25	87.05	1.80	\$\$1	As above/ conglomerate at lower contact		<u> </u>	Ļ_										
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1		67.05	33,03	0.00	I SLST	Dark grey SLST, minor SSI, minor to trace		 —	 	├	 -	!		 -	<u> </u>				
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								1	\vdash	1	 	 		 					
		93.05	103.50	10.45	SS1	SS2													
1-1		<u> </u>		 _		Clean, bleached, tan SSI stick fairly massive		53°	101.2	0									
-		 				occasional carbonaceous wisps	_	—	ļ	╀	 -	<u> </u>		<u> </u>		<u></u>			
		103.50	104 28	0 78	CONC	SS1	├	₩-	┼	 		ļ	<u> </u>	 	<u> </u>			<u> </u>	 !
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		104.28	107.28	3.00	SS1	As above, clean stick		58°	107.0	 	1	 		·	 		·		
I —		101 00		.	· .														
1		107.28	111.34	4.06	SS2	Carbonaceous	_	100											
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		111,34	111.72	0.38	CONG.	Dark grey SS2 matrix dark grey pebble clasts up	\vdash	 	1	+-	+-	┼──	 	+	 	 			
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ALL LINEAR UNITS IN METRES

A ANGLE MEASURED FROM CORE AXIS

HOLE No.

FILE No BA - 267 REVISED Fob. 1081 FORMERLY FILE No. BA-212A

^{# :} MEASURED FROM THE HORIZONTAL PLANE

^{1 :-} R &/OR 5 - GOLDER ASSOCIATES HARDNESS CODE

^{*}ROD - ROCK QUALITY DESIGNATION (%)

FF ---- FRACTURE PREQUENCY

CORE & COAL CORE DESCRIPTION

PROJECT	ZYMOETZ RIVER	HOLE No. 77,301	PAGE_3
AREA	SMITHERS, B.C.	CONTINUED 22-301	OF4

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1 . I	MT TOP			TH.	MAIN	AMPLIFIED (INCLUDE COAL RECOVERY FOR EACH SEAM)	DESIG		HARD	FRAC.	RQD	SAMPLE NO.		5T %	ASH %	V.M.%	F.C.%	F.S.1.	C.V.
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Ш			100-00		****				dept	-									
\vdash		111.92	138.00	26.00	IGN	White, chalky looking igneous rock felspors		-	├──										
						weather to clay forming pits/ some quartz visible			├─					 					
						massive	┝				 	 	-		-				
 -				\vdash		coarse crystalline text	-	1	 	 	·			 			-		
₩	i					gives a high gamma response sampled for thin section	_		 	-									
 						Sampled for cittle seccion	<u> </u>	 	 	╁╌┈	 	 							
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		2000	1,11,00			are greys neathered as and in proces	\vdash	· · · ·	 		 	 			1		T		
		141.60	150.25	8.65	SLST	Medium grey massive, occasional conglomerate zone		57°	143.	0	1	 		Ĭ .	1				
\vdash			100,20	1		Testain die y massifes sous faller solle solle solle		1	1										
\Box		150.25	151.75	1.50	CONG.	Grey SS1 matrix, sub angular pebble clasts													L
			L				L												
		151.75	164.90	13.15	SS1	SLST	<u> </u>		↓	<u> </u>	1	ļ <u> </u>	<u> </u>	<u> </u>	ļ		 		—
				ļ	1	Light grey SSI with thin interbedded dark grey	L_	<u> </u>	ــــــ	<u> </u>	↓		<u> </u>	<u> </u>	 		├		<u> </u>
				<u> </u>		siltstone, bioturbation evident some soft sedimer	<u> </u>	₩	 	ļ	ļ	↓		 	<u> </u>	 -	 		
		<u> </u>		<u> </u>	<u> </u>	deformation.	1	-	ļ	-	<u> </u>	 	<u> </u>	. 	 	 	 		
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\square		164.90	170.22	5.32	SSI	Carponaceous	 	630	1,75	 -	╄	 	!	4	+	 	 	 	
		<u> </u>		 	Ь——	Medium grey - massive bedded carbonaceous	₩	103	169.	Ψυ		+			+	 	 	 	\vdash
\vdash		1 70 00		 	550	DOUGLOWER ATT	┼	+	+		+	-	 	- }	1	 	╂──	╁──	├──
1-1		170.22	1/1./2	11.50	225	CONGLOMERATE		+	 	-		╀	 	 	+	! 	 	 	
\mathbf{H}		 		 	 	Medium grey, medium sandstone, minor conglomerate bebbles near bottom		700	71.2	20		+	 	 	+	 	+	-	
\vdash		 	 	├	<u> </u>	penotes hear boccon	+	1/0	1/3.6	· · · · ·		+	 	+	1	 -	 	 	
Н		171.72	170 20	 	L CC1	CERRONECCOUC	 	+	+	 		_	1 -		1	 	† 	 	\vdash
\vdash		. / - / 	179.22	1/-25	1 221	CARBONACFOUS Medium grey massive, minor carbonaceous wisps po			+	+	-	+	 	 	1	1	 	1	
-		 	 	1		bedding .	4-	┪╌┈	1	1	1	 	1	1		†	 	<u> </u>	—
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1		179.22	105 22	16 00	CLCT	551		1	+		+		1	 	1		1	1	1
-		11/3.66	133.66	10.00	/ JEJ I	Dark grey fairly massive stick occasional SSI la	/Lr	700	186.		1	1		1	1	1 .	1	1	1
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 	 	195.22	196 72	1 50	122	552	1-	 -	1		1	1	1	1			T		L
—		127.66	130.72	1 ***	331	Dark grey massive SS1 grades to SS2-SS3 near bot	t.dan.	\top				T				1		1	
	i.					with small pebbles		1										Ī	
	:	1	1																1
	1	196.72	212,40	15.6	SS2	ight grey to chalky white SS2 massive, minor												1	
	1:		I	1		carbonaceous fragments and wisps.							<u> </u>			.ļ			
	li.						\Box						\perp						
	11	212.40	217,50	5,30	D SS1	CARBONACEOUS				1_		4	<u> </u>		_	 	1	<u> </u>	+
	H					ight grey SS1 with wispy carbonaceous stringers				4_		4			+			 	-
	iţ.					wavy bedding, soft sediment, micro faults.	4	—	-	-	┿				 			 	+
	1						ـــــــــــــــــــــــــــــــــــــــ									1			

ALL LINEAR UNITS IN METRES

FF ---- FRACTURE FREQUENCY

A ANGLE MEASURED FROM CORE AXIS

HOLE No.

FILE No BA-207 REVISED Fob. 1981 FORMERLY FILE No. BA-212A

^{# :} MEASURED FROM THE HORIZONTAL PLANE

^{* : •} R &/OR 5 — GOLDER ASSOCIATES HARDNESS CODE

[•] ROD - ROCK QUALITY DESIGNATION (%)

CORE & COAL CORE DESCRIPTION

PROJECT	ZYMOETZ RIVER	HOLE No. 77 30	PAGE 4
AREA	SMITHERS B.C.	CONTINUED ZZ-301	OF4

BOX D	EPTH	DE	7TH			LITHO DESCRIPTION	SEAM		SUMM	ARY GE	OTECH				ANALY	TICAL	DATA		\Box
No.	EPTH T TOP OF BOX	FROM	то	TH.	MAIN	AMPLIFIED (INICLUDE COAL RECOVERY FOR EACH SEAM)	DESIG	ANGLE	HARD- NESS	FRAC FREQ	ROD	SAMPLE NO.		ST % residual	ASH %	V.M.%	F.C.%	F,S.1,	C.V.
	8UA				-	• • • • • • • • • • • • • • • • • • • •		.,,											
		217.70	221.05	3.35	SS1	Pale grey to white massive													
 -		221.05	288,00	<u>66.35</u>	IGN	Identical to igneous unit described above, massi	re		-	ļ									
\vdash		288,0C	204 70	6 70	CC1	SLST			-	 			_						
-		200.00	234170	10-70	331	Light grey SS1 with dark grey SLST rip up clasts	\vdash												
		Ĺ				Light grey SS1 with dark grey SLST rip up clasts evident. Poorly bedued.													
			004 70			510 05 1101 =	<u> </u>	ļ	—	<u> </u>									
-		 	294.70	├─		END OF HOLE	 	├	-					╂	-				
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ALL LINEAR UNITS IN METRES

FF ----- FRACTURE PREQUENCY

A ANGLE MEASURED FROM CORE AXIS

HOLE No.

FILE No BA-267 REVISED Fob. 1981 FORMERLY FILE No. BA-212A

^{# :} MEASURED FROM THE HORIZONTAL PLANE

^{1 :+} R 4./OR 5 - GOLDER ASSOCIATES HARDNESS CODE

[.] RQD - ROCK QUALITY DESIGNATION (%)



B.C. COAL LICENCES TENURE STANDING

PROJECT:	ZYMOETZ RIVER	YEAR:	1983-84	
		DATE		

GROUP						ANNIVERSARY	WORK REQUIREMENT				TOTAL EXPLORATION					
NO.	NO.	LEGAL DESCRIPTION	AREA TOTAL/HA	YEAR	FEES	ANNUAL	TOTAL NEXT ANN.	DATE	EXPIRED	CURRENT	LIC. TERM	EXC. CREDIT	YEAR	AMOUNT	CASH IN LIEU	REMARKS
322	7	NTS 93-L-13	1674		70	8,370	53,520	MAY 9	183,536	71,025		_	1979	116,435		THE LICENCES ARE
	4252	LOT 5554	195	78						9,750	7		1980	782		IN GOOD STANDING
	4253	LOT 5555	195	78						9,750	7		1982	18,233	3,765	ON MAY 9TH, 1984
	4254	LOT 5560	259	78						12,950	7		1984	41,391	3,130	RENT IS PAID FOR
	4255	LOT 5561	259	78					<u> </u>	12,950	7					84-85. THERE IS N
	4257	LOT 5570	259	78						12,950	7					EXCESS CREDIT ON
	6172	LOT 5556	248	80						6,200	5		į		·	THESE LICENCES FOR
	6173	LOT 5571	259	80						6,475	5					1984-85 TERM.
,	†													·		
		<u> </u>														
																
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BA-312



Province of British Columbia Ministry of Energy, Mines and Petroleum Resources

APPLICATION TO EXTEND TERM OF LICENCE

, Leslie V. Gramantik	agent for She	11.Canada.Resources.Limited
P.O. Box 100 (Address)		
61k 4 ·		
Alberta		.2M7 266248
		, 266248
hereby apply to the Minister to extend & 6173, 7 Licences, 1	the term of Coal Licence(s) No(s) 674 Hectares	4232-4233, 4237, 0172
for a further period of one year.		
2. Property name Zymgetz .Ri.v	er, Group #322, Coast Range	. 5. L.D.
3. I am allowing the following Coal Licen	ce(s) No(s), to forfeit NA	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	. ,	• • • • • • • • • • • • • • • • • • • •
4. I have performed, or caused to be perf	ormed, during the period	1983 to
	1984 work to the value o	
on the location of coal licence(s) as fol	lows:	
CATEGORY OF WORK		
	Licence(s) No(s).	Apportioned Cost
Geological mapping		
Surveys: Geophysical		***************************************
Geochemical		
Other		
Road construction	· · · · · · · · · · · · · · · · · · ·	
Surface work	6172	1,300
Underground work	· · · · · · · · · · · · · · · · · · ·	
Drilling	6172	30,831
Logging, sampling, and testing	6172	6.855,
Reclamation	6172	710
Other work (specify)		• • • • • • • • • • • • • • • • • • • •
Off-property costs		
5. I wish to apply \$, of this value of work on Coal Licence	
6. I wish to pay cash in lieu of work in the 6172 & 6173	e amount of \$3,130	, on Coal Licence(s) No(s).
7. The work performed on the location(s) River Geological Repo		
April 10th 184		jaman()
	Acc	istant Landman

GEOLOGIC	CAL MAPPI			Yes			No	⊠	
		Area (Ho	ictares)		_	ical e			Duration
Reconnaiss			 .						
Detail: Su Un	rrace iderground								
Other* (spe	cify)								
						1	otal Co	ost \$	• • • • • • • • • • • • • • • • • • • •
_		HEMICAL SURVEYS		Yes			No	×	
Method									
Grid				• • • • •					
Other* (spe	cify)								
	, .								
ROAD CO	NSTRUCTIO	ON		Yes			No	8	
Length				Width					
On Licence	(s) No.(s)						<i>.</i>		
Access to									
					_				
SURFACE	WORK			Yes	×		No		
		Length		Width	1		Del		Cost
Trenching Seam Traci	1343								
Crosscuttin	-		arara arar Kanzaran						
	ecify)	Helicopter Dri	II Site Co	nstru	ction				
								Total Cost \$.	.1.300
UNDERGR	OW DRUGG	яK		Yes			No	2	
		No. of Adits Ma	ximum Length	No	o. at Hol	les	To	tal Metres	Cost
Test Adits	_								· · · · · · · · · · · · · · · · · · ·
Other work	cin gs"								\$
					-			_	•
DRILLING	ì			Yes	2		No Total	United to	Cost
		Hole Size	•	No. of H	Died		Otal	MINITERS.	COST
	iamond ireline			1					
W	iamond ireline onventional	NQ		1.			29		
W Rotary: Co Ro	ireline onventional everse circula	NQ		1.			29 <i>!</i> 	1.7,	
W Rotary: Co Re Other* (sov	ireline onventional everse circula ecify)	NQ		1.			29 <i>!</i> 	1.7	
W Rotary: Co Ro Other* (spe	ireline onventional everse circula ecity)	NQ	Drill Co.	1.			29	4.7	
W Rotary: Co Ro Other* (spe	ireline onventional everse circula ecity)	ntion	Drill Co.	1.			29	4.7	
W Rotary: Co Ro Other (spe Contractor Where is th	ireline onventional everse circula ecify)	ntion	Drill Co.	1.			29	4.7	
W Rotary: Co Ro Other (spe Contractor Where is th	ireline conventional everse circula ecify)		Drill Co.	Ltdierie.	S		294	Total Cost \$.	30.831
Rotary: Co Ri Other * (spi Contractor Where is th	ireline conventional everse circula ecify)		Drill Co. alley Coll	Ltd. ierie Yes Core sa Density	S	23 23	29!	Total Cost \$.	30,831
Rotary: Co Ri Other * (spi Contractor Where is th	ireline conventional everse circula ecify)		Drill Co. alley Coll	Ltd ierie. Yes Core sa Density	S	 ⊗ ⊠	29!	Total Cost \$.	30,831
Rotary: Co Ri Other * (spi Contractor Where is th	ireline conventional everse circula ecify) y t I t le core stored SAMPLING Lithology: Logs: ecify) Testing:	Thomas Diamond Thomas Diamond Bulkley V G AND TESTING Drill samples Gamma-neutron Proximate analysis	Drill Co.	Ltdierie. Yes Core sa Density	S	3 8	29!	Total Cost \$. Bulk sample	30.831
W Rotary: Co Ric Other* (spe Contractor Where is th LOGGING	ireline conventional everse circula ecify)	Thomas Plamond Bulkley V G. AND TESTING Drill samples Gamma-neutron	Orill Co. alley Coll	Ltd. ierie Yes Core sa Density	S	8 8	294	Total Cost \$ Bulk sample Washability	.30.831
W Rotary: Co Ric Other* (spe Contractor Where is th LOGGING	ireline conventional everse circula ecify)	Thomas Plamond Bulkley V G. AND TESTING Drill samples Gamma-neutron	Orill Co. alley Coll	Ltd. ierie Yes Core sa Density	S	8 8	294	Total Cost \$ Bulk sample Washability	.30.831
W Rotary: Co Ric Other* (spe Contractor Where is th LOGGING	ireline conventional everse circula ecify)	Thomas Diamond Thomas Diamond Bulkley V G AND TESTING Drill samples Gamma-neutron Proximate analysis	Orill Co.	Ltdi.e.r.	mples	8 8	No	Total Cost \$ Bulk sample Washability Plasticity Total Cost \$.30.831
W Rotary: Co Ric Other (specific state) Contractor Where is the LOGGING	ireline conventional everse circula ecify)	NQ	Orill Co.	Ltd., i.e.r.	mples aphie	8 8		Total Cost \$ Bulk sample Washability Plasticity Total Cost \$	30.831
W Rotary: Co Ric Other (specific state) Contractor Where is the LOGGING	ireline conventional everse circula ecify)	Thomas Plamond Bulkley V G. AND TESTING Drill samples Gamma-neutron	Orill Co.	Ltd., i.e.r.	mples aphie	8 8		Total Cost \$ Bulk sample Washability Plasticity Total Cost \$	30.831
W Rotary: Co Ric Other (specific for the specific for the	ireline conventional everse circula ecify)	NQ Thomas Plamond R Bulkley V G AND TESTING Drill samples Gamma-neutron Proximate analysis Carbonization	Drill Co. alley Coll ⊠	Ltd., i.e.r.	ss mples	88 8	No No	Total Cost \$ Bulk sample Washability Plasticity Total Cost \$	30.831
Rotary: Co Ric Other* (spe Contractor Where is th LOGGING Other* (spe Other* (spe RECLAMA Details OTHER W	ireline conventional everse circula ecify)	Thomas Plamond Thomas Plamond Rulkley V G. AND TESTING Drill samples Gamma-neutron Proximate analysis Carbonization	Orill Co. alley Coll .F.S. Requ	Ltd i.e.r.i.e. Yes Core sa Density FSI Petrogr Yes est	mples aphic	88 88 C	No No No	Total Cost \$ Bulk sample Washability Plasticity Total Cost \$ Total Cost \$	30.831 6,855 710 Cost
Rotary: Co Ric Other* (spe Contractor Where is th LOGGING Other* (spe Other* (spe RECLAMA Details OTHER W	ireline conventional everse circula ecify)	NQ	Orill Co. alley Coll .F.S. Requ	Ltd i.e.r.i.e. Yes Core sa Density FSI Petrogr Yes est	mples aphic	88 88 C	No No No	Total Cost \$ Bulk sample Washability Plasticity Total Cost \$	30.831 5
Rotary: Co Ric Other* (spe Contractor Where is th LOGGING Other* (spe Other* (spe RECLAMA Details OTHER W	ireline conventional everse circula ecify)	Thomas Plamond Thomas Plamond Rulkley V G. AND TESTING Drill samples Gamma-neutron Proximate analysis Carbonization	Orill Co. alley Coll .F.S. Requ	Ltd i.e.r.i.e. Yes Core sa Density FSI Petrogr Yes est	mples /	8 8 0 0	No No No	Total Cost \$ Bulk sample Washability Plasticity Total Cost \$ Total Cost \$	30.831 6,855 710 Cost
W Rotary: Co Re Other (specific specific specifi	ireline conventional everse circula ecify)	NO	Drill Co. alley Coll .F.S. Requ	Ltd i.e.r.i.e. Yes Core sa Density FSI Petrogr Yes est Yes	mples aphie	8 8 0 0	No No No	Total Cost \$ Bulk sample Washability Plasticity Total Cost \$ Total Cost \$	30.831
W Rotary: Co Re Other (specific specific specifi	ireline conventional everse circula ecify)	NQ	Drill Co. alley Coll .F.S. Requ	Ltd i.e.r.i.e. Yes Core sa Density FSI Petrogr Yes est Yes	mples aphie	8 8 0 0	No No No	Total Cost \$ Bulk sample Washability Plasticity Total Cost \$ Total Cost \$	30.831
W Rotary: Co Re Other (specific specific specifi	ireline conventional everse circula ecify)	NO	Drill Co. alley Coll .F.S. Requ	Ltd i.e.r.i.e. Yes Core sa Density FSI Petrogr Yes est Yes	mples aphie	8 8	No No No No	Total Cost \$ Bulk sample Washability Plasticity Total Cost \$ Total Cost \$	30.831 6,855 710
W Rotary: Co Ric Other * (specific specific spec	ireline conventional everse circula everse circula ecify) SAMPLING Lithology: Logs: ecify) Testing: ecify) ATION LOD & SCC VORK (Speci	NO	Drill Co. alley Coll .F.S. Requi	Yes Core sa Density Yes Yes Yes Yes Yes Oduct	mples aphic	38 18	No No Total E	Bulk sample Washability Plasticity Total Cost \$ Total Cost \$ Total Cost \$ Total Cost \$	30.831 6,855 .710 Cont
W Rotary: Co Ric Other * (specific specific spec	ireline conventional everse circula everse circula ecify) SAMPLING Lithology: Logs: ecify) Testing: ecify) ATION LOD & SCC VORK (Speci	NO	Drill Co. alley Coll .F.S. Requi	Yes Core sa Density Yes Yes Yes Yes Yes Oduct	mples aphic	38 18	No No Total E	Bulk sample Washability Plasticity Total Cost \$ Total Cost \$ Total Cost \$ Total Cost \$	30.831 6,855 .710 Cont
W Rotary: Co Ric Other * (specific specific spec	ireline conventional everse circula everse circula ecify) SAMPLING Lithology: Logs: ecify) Testing: ecify) ATION LOD & SCC VORK (Speci	NO	Drill Co. alley Coll .F.S. Requi	Yes Core sa Density Yes Yes Yes Yes Yes Oduct	mples aphic	38 18	No No Total E	Bulk sample Washability Plasticity Total Cost \$ Total Cost \$ Total Cost \$ Total Cost \$	30.831 6,855 .710 Cont
W Rotary: Co Ric Other * (specific specific spec	ireline conventional everse circula everse circula ecify) SAMPLING Lithology: Logs: ecify) Testing: ecify) ATION LOD & SCC VORK (Speci	NO	Drill Co. alley Coll .F.S. Requi	Ltdi.e.rie. Yes Core sa Density FSI Petrogra Yes est Yes oduct	mples aphie	8 2 3 3 3 4 3 5 3 3 4 3 3 3 3 3 3 4 3 3 3 3 3 3 3 3 3 3	No No Total E	Total Cost \$ Bulk sample Washability Plasticity Total Cost \$ Total Cost \$ Total Cost \$ Signaturel	30.831 6,855 .710 Cont