

ASSESSMENT REPORT
REPORT ON TRENCHING PROGRAM
ON PARTS OF COAL LICENCES
3986 to 3993 INCLUSIVE
PINE RIVER AREA
LIARD MINING DIVISION
N.T.S. 93 0 9

Latitude 55°36' North
Longitude 122°14' West

by

HAROLD M. JONES, P.Eng.

August 15, 1980

GEOLOGICAL BRANCH
ASSESSMENT REPORT

00 594

G. A. NOEL AND ASSOCIATES
CONSULTING GEOLOGISTS
VANCOUVER, B. C.

OPEN FILE

ASSESSMENT REPORT

REPORT ON TRENCHING PROGRAM
ON PARTS OF COAL LICENCES
3986 to 3993 INCLUSIVE
PINE RIVER AREA
LIARD MINING DIVISION
N.T.S. 93 0 9

Latitude $55^{\circ}36'$ North
Longitude $122^{\circ}14'$ West

Owner of Licences: J.W. MacLeod, P.Eng.
Operator: Semper Resources Inc.
Consultant: H.M. Jones, P.Eng.
G.A. Noel & Associates, Inc.

Author: Harold M. Jones, P.Eng.

Date submitted: August 15, 1980

CONFIDENTIAL

TABLE OF CONTENTS

	<u>Page</u>
SUMMARY	1
INTRODUCTION	3
Location and Access	3
Topography and Vegetation	5
Property	7
History	8
FIELDWORK	10
Mobilization	10
Trenching	11
Geological Mapping	13
Sampling	14
GEOLOGY	14
Regional Geology	14
Local Geology	15
Structural	17
RESULTS	21
Coal Zones	21
Samples and Assays	24
Correlation of Coal Seams	26
RECLAMATION	28
CONCLUSIONS	28
Recommendations	30
Cost Estimate	30
REFERENCES	32
CERTIFICATE	33
APPENDIX I - SUMMARY OF EXPENSES	
APPENDIX II - ASSAY CERTIFICATES	

LIST OF ILLUSTRATIONS

	<u>Page</u>	
FIGURE 1 - Location Map	4	
" 2 - Coal Licence Map	6	
" 3 - Topographic Map showing Location of 1980 Surface Workings	In Pocket	✓
" 4 - Trench 1 - Geology	"	✓
" 5 - Trench 2 - Geology	18	-
" 6 - Trench 3 - Geology	19	/
" 7 - Trench 4 Geology	20	/
" 8 - Trench 5 Geology	In Pocket	✓
" 9 - Trenches 1-4 - Composite Map	"	✓

SUMMARY

Between July 3 and August 3, 1980 G.A. Noel & Associates Inc. conducted an exploration program consisting of backhoe trenching, sampling & geological mapping on selected parts of coal licences 3986 - 3993 inclusive. These licences are located in the Willow Creek area of Pine Valley and are held under option by Semper Resources Inc. Work was conducted by one geologist-supervisor, a backhoe and operator chain saw operator and a cook.

The purpose of the program was to expose by trenching poorly exposed coal seams located during a reconnaissance exploration program on the licences the previous year and to satisfy assessment work requirements.

All work was conducted on coal licences 3987 and 3992. On licence 3987 a total of 763 metres of trenching was completed in 4 trenches while on licence 3992 297 metres of trenching was completed. Four road cuts, totalling 120 metres was also completed.

Coal seams were exposed in all trenches. Those on licence 3987 vary between 0.5 - 2.0 metres in width and vary considerably along strike. Correlation between trenches is difficult. It is thought that at least 4 coal seams are present in this area which average at least 1 metre in width.

On licence 3992 three very significant coal zones were discovered. These contain 2.1, 6.77 and 2.15 metres of coal respectively. Two seams within the latter zones contain coal of or approaching metallurgical grade.

It was concluded that because of the encouragement from the trenching program and the proximity of the licences to rail transportation further work should be conducted.

A program of backhoe trenching and diamond drilling is recommended. Stage I is estimated to cost \$280,000, Stage II \$550,000.00

INTRODUCTION

G.A. Noel & Associates conducted between July 3 and August 3, 1980 a program of backhoe trenching on selected areas within an eight coal licence group in the Pine River Area of North-eastern British Columbia. This work was performed at the request of Semper Resources Inc., optionee of the licences, as a follow-up to a reconnaissance geological mapping program conducted by the writer the previous year on the same coal licences. The crew consisted of one senior geologist, one chain saw operator, a backhoe operator and a cook.

The purpose of the program was to test by backhoe trenching areas of poorly exposed coal seams located during the previous year's work. The work was also conducted to satisfy assessment work requirements.

Location and Access

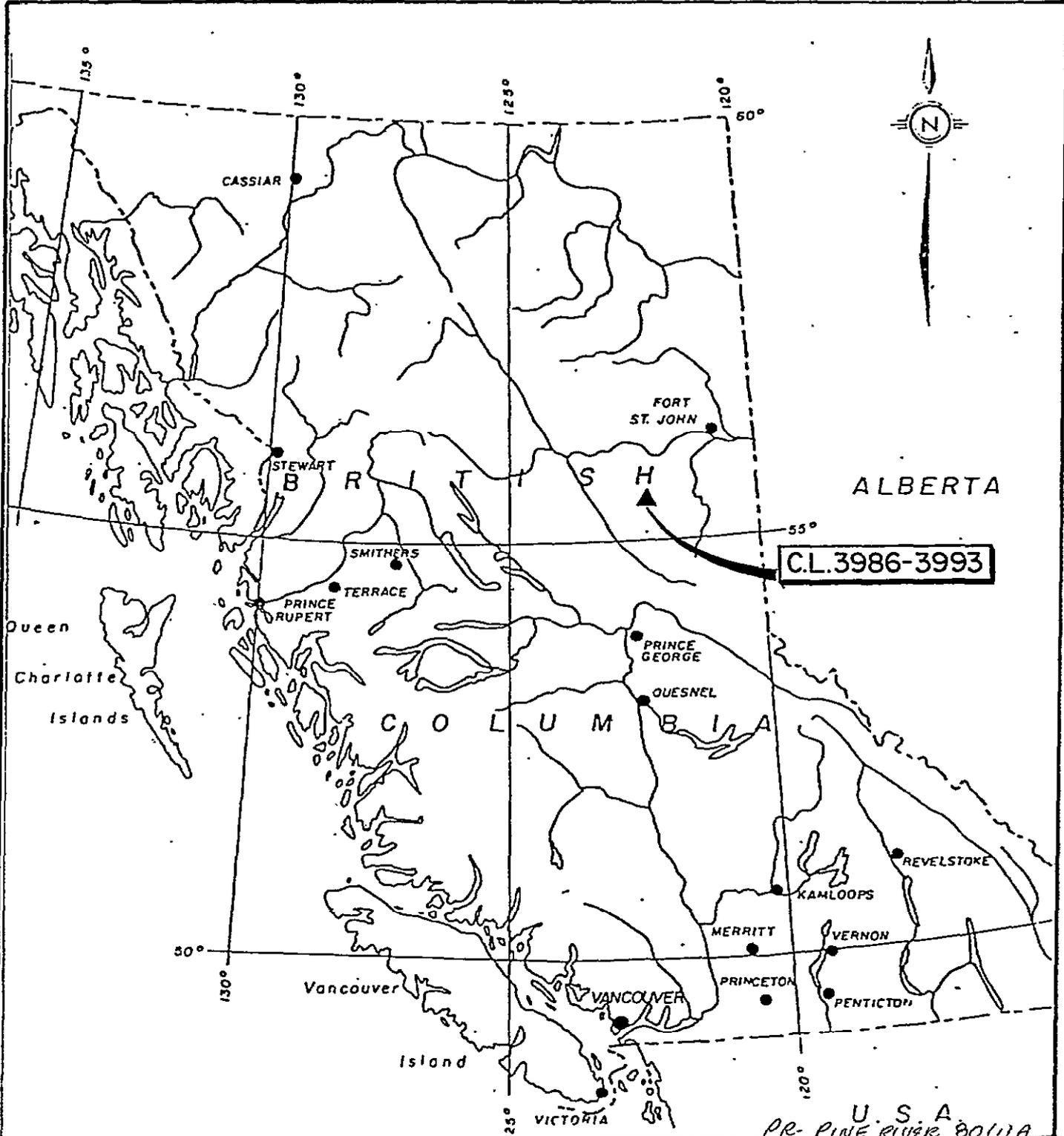
The property is located at the following approximate co-ordinates:

55°36' north latitude
122°14' west longitude

The coal licenses are located in the Peace River district of Northeast British Columbia (see Figure 1). They are situated adjacent to the Pine River approximately 38 km. west of Chetwynd and 190 km. north-northeast of Prince George.

As shown on Figure 2, the coal licences are not contiguous. Seven lie to the south of the Pine River and one to the north. Elevations throughout the licences range from 640 m. in the Pine Valley to 1310 m. on the peak at the head of Brown Creek (coal licence 3991).

Access to the general area is via British Columbia highway 97, which is an all weather road connecting Prince George to Dawson Creek. It passes through Pine Valley and Chetwynd.



C.L. 3986-3993

0 100 200 300 400 500 KILOMETRES

SEMPER RESOURCES INC.		
G.A. NOEL & ASSOCIATES, INC.		VANCOUVER, B.C.
LOCATION MAP COAL LICENCES 3986-3993 PINE RIVER AREA, B.C. LIARD M.D.		
SCALE: 1 cm. = 87 Km	AUGUST 1980	FIG. 1
H. JONES		

B.C. Rail also passes through Pine Valley, with the highway on the north side and the railway on the south side of Pine River. The highway passes just south of licence 3989 while the railway crosses through the northwest corner of licence 3988.

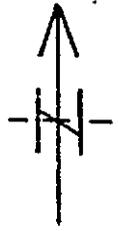
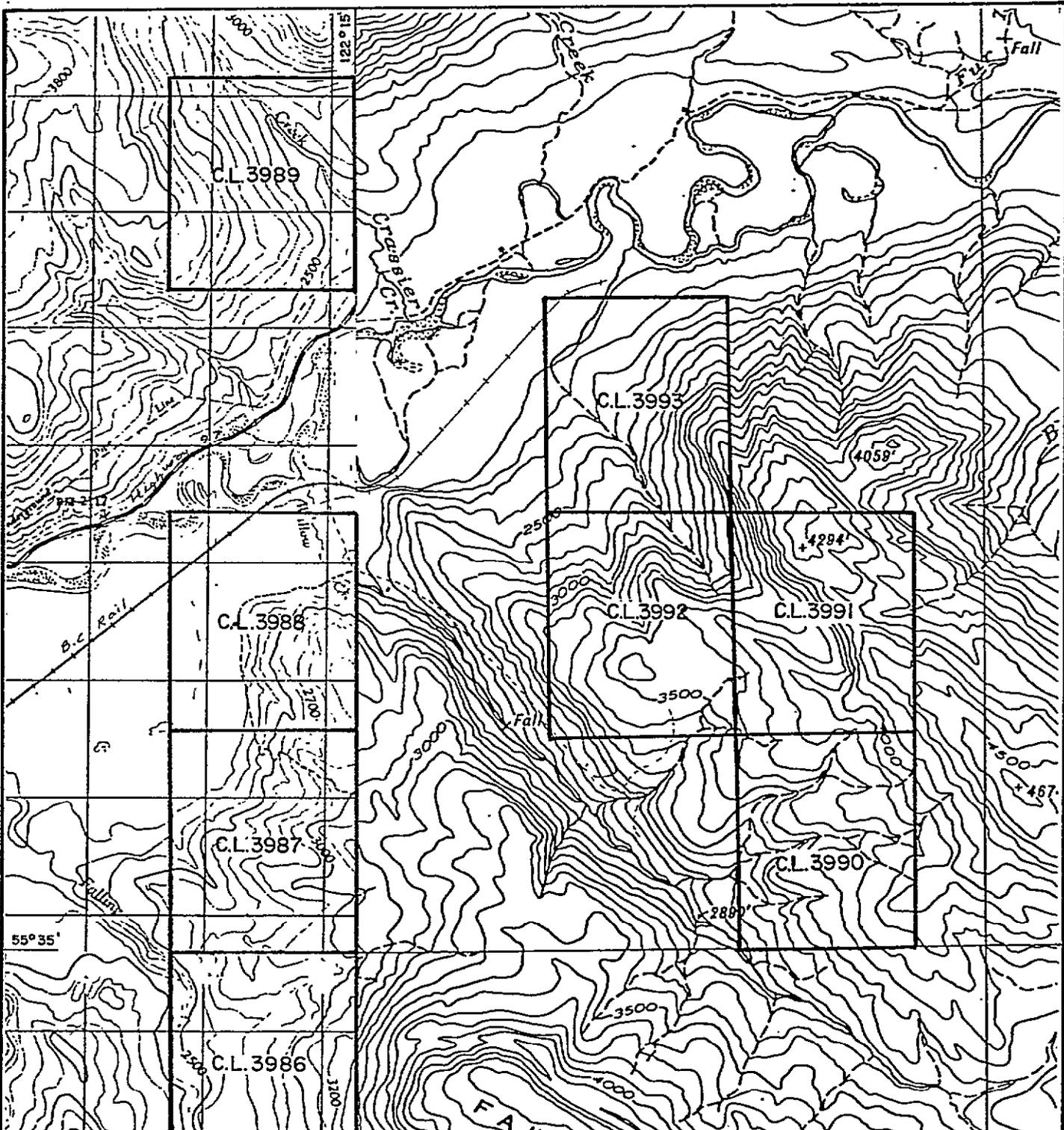
Dawson Creek and Fort St. John, approximately 100 km. and 160 km. respectively north of Chetwynd, are serviced by daily flights by commercial airlines. Numerous helicopters are available at Chetwynd 38 km. to the east.

Access to the one coal licence north of highway 97 is by a good power line service road. The seven licences south of the Pine River are readily accessible by 4 wheel drive vehicles in times of low water by fording the river at Willow Creek. Once across the river good roads provide access to the coal licences.

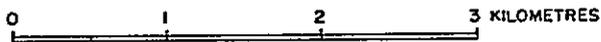
In periods when the Pine River is not fordable, the only access is by helicopter. Landing sites are few due to the relatively thick forest cover. Landings may be made on Willow Creek approximately 0.5 km. south of the B.C. Rail right-of-way, at the capped gas well on Willow Creek near the southwest corner of licence 3992 and at several small clearings along the seismic line which runs northeasterly through licences 3987, 3991 and 3992.

Topography and Vegetation

The coal licences are located on the eastern foothills of the Rocky Mountains. The area is characterized by relatively low, rounded, northwest-southeast trending ridges and valleys dissected by the northeast trending 1.5 km. wide Pine River



David A. Jones



SEMPER RESOURCES INC.		
G.A. NOEL & ASSOCIATES, INC.		VANCOUVER, B.C.
COAL LICENCE MAP C.L. 3986 - 3993 PINE RIVER AREA, B.C. LIARD M.D. <i>PE-PINE RIVER 80(1)A</i>		
SCALE: 1:50,000	AUGUST 1980	FIG. 2
H. JONES		

Valley. In the licences area there is a change in elevation relative to the Pine Valley of only 670 metres (Figure 3).

All coal licences are well forested by jackpine and minor spruce. Poplar stands are common in low areas, like Pine Valley, and in wet areas, such as creeks and seepages.

Most of the forested terrain may be classified as open forest, i.e. with little or no underbrush. The exception to this is in wet areas where willows and devil's club are common.

Property

The property consists of eight coal licences (Figure 2). They are:

<u>Coal Licence</u>	<u>Hectares</u>	<u>Expiry Date</u>
3986	293.0	August 8, 1981
3987	292.0	"
3988	292.6	"
3989	292.2	"
3990	292.6	"
3991	292.6	"
3992	292.6	"
3993	292.6	"
Total area	2341 Hectares	

The coal licences are owned by:

J.W. MacLeod, P.Eng.
1220 Arbutus Street
Vancouver, B.C.

They are presently held under option by:

Semper Resources Inc.
1010 - 474 Howe Street
Vancouver, B.C.

History:

Coal in the Peace River district of northeastern British Columbia was known for many years. The better known coal area was the Peace River Canyon coal field where coal was first noted along the canyon walls by Alexander Mackenzie in 1793. The first coal licences in the Peace River district were acquired in this area in 1908.

From 1908 to the late 1960's very limited tonnages of coal were mined intermittently from four mines, three of which were located in or near the Peace River Canyon and one 15 km. south of the Pine River.

Between 1946 and 1951 the Coal Division of the B.C. Department of Lands and Forests conducted a coal exploration program in the Peace River district adjacent to the proposed (at that time) right-of-way of the Pacific Great Eastern Railway (now B.C. Rail). This work was carried out in the Pine River area. The project area extended from several kilometres northwest of Pine River to approximately 25 km. southeast of it.

Their program consisted of geological mapping, bulldozer trenching, diamond drilling and sampling (McKechnie 1955). Eighty-one holes were diamond drilled totalling 14,829 metres of which coal seams 0.3 m. or thicker accounted for 428 m. of the total.

Their program tested three areas. These areas and their estimated tonnages are:

Hasler Creek	8	million short tons
Willow Creek	23.8	" " "
Noman Creek	9.0	" " "

The above estimates were made using only seams of 1.2 m. or greater in thickness.

Coal licences 3986 to 3992 inclusive fall mostly within the above Willow Creek area.

The Government work tested only parts of the above areas. It did not include the coal area at Crassier Creek (licence 3989) nor did it include coal in some of the more structurally disturbed areas. No serious work was carried out after the government's program in the Pine River area until 1969 when Bremeda Resources Ltd. conducted a trenching and drilling program on the Noman Creek coal seams. They drilled 22 holes totalling 4567 metres and traced two main seams for approximately 3 km. to the northwest of the highway. While the grade of the coal was high, tight folding and limited tonnage made the property unattractive. The writer supervised this program.

Also, in 1969, Bremeda Resources Ltd., at the writer's recommendation, commenced work on the Bullmoose coal field located approximately 55 km. southeast of the Pine River area. Early work in this area quickly indicated the potential of the Bullmoose area as a major coal field. This initiated a coal exploration "boom" in the Peace River district which is still continuing.

Two major coal deposits have now been proven up. They are the Bullmoose and Quintette properties, each a multimillion ton deposit of metallurgical grade sub-bituminous coal. When rail transportation is available, both deposits will be put into production.

In 1979 the writer conducted a reconnaissance program on coal licences 3986-3993.

FIELDWORK

The object of the field program was to expose by backhoe trenching, areas of poor coal outcrops observed during the geological mapping program in 1979 (Jones, 1979). It was also planned to explore in the vicinity of the poor coal exposures for additional coal seams.

Due to a restricted budget an attempt was made to obtain a reasonable amount of information within a limited area rather than explore over the entire eight coal licences. For this reason most of the work was conducted on selected areas on coal licences 3987 and 3992.

A base map, on a scale of 1:5000 and contours at 20 metre intervals, was prepared as a pencil manuscript last year by Pacific Survey Corporation. When printed, many of the contour lines were "lost". This season these contours were redrafted in ink. This map (Figure 3) accompanies the report and shows the location of all 1980 surface work:

Mobilization

On commencement of the program the Pine Valley area was struck

by a torrential rain storm. Overnight, the Pine River rose an estimated 60 cm. and prevented fording the river by both the backhoe and the 4 wheel drive vehicle. Two days were lost waiting for the water level to drop sufficiently for the backhoe to cross. The truck could not cross for another week.

It was very quickly learned that while the property is readily accessible it maybe awkward to reach. No arrangement could be made with B.C. Rail regarding transporting the backhoe and vehicle to the property and with high water fording was difficult. The final solution to get the truck to the Willow Creek area was to ford the river 1.5 km. upstream of Willow Creek and drive back on the B.C. Rail tracks.

A camp was set up on the north side of the Pine River opposite the mouth of Willow Creek. This provided a handy location to the property and also to highway 97. A 3.6 metre aluminum boat equipped with a 9.9 H.P. outboard motor provided the transportation across the river. A 250 m. trail was cut from the south side of the river to the B.C. Rail right-of-way. The vehicle was parked at the B.C. Rail Willow Creek bridge approximately 300 metres east along the tracks from the cut trail. The truck was used for transporting personnel and fuel to the trenching area.

Transportation to Chetwynd and Prince George for supplies and spare parts were by pick-up truck loaned from S. Brewer, backhoe contractor.

Trenching

Trenching was carried out by a John Deere 450C crawler-type combination front end loader-backhoe owned and operated by

Mr. Stan Brewer of Vernon, B.C. The machine was transported to the camp area by Mr. Brewer in his International dump truck, then forded across the river and walked to the working areas.

Trenches were laid out in the areas of interest by running a flagged compass line down the proposed center line of the trench. Then one man, equipped with a Homolite XL 12 chain saw with 16 inch bar, proceeded to fall all timber along the trench right-of-way and buck it into 2-3 metre lengths. He also fell any "leaners" in the trench area, whether caused by our program or not.

After all trees were fallen and bucked, the trench area was cleared to a width of 4-5 m. using the front bucket on the loader as a blade. All debris was windrowed along one side. Trenching then commenced close to one edge of the clearing leaving ample room to store the excavated material.

Depth of overburden was variable from 0.2 metres to greater than 3.5 metres. Most trenches averaged 1.0 - 1.5 m. in depth except in significant coal seams which were deepened to at least 2 m. in search of fresher coal.

Each trench had sections where the overburden was too deep to permit exposing. In all trenches but one these areas occurred at the ends of the trenches, often in topographic depressions.

When bedrock was lost due to deep burial several step-out test pits were dug to approximately 4 m., the limit of the equipment. If no bedrock was encountered trenching was terminated.

When each trench was completed the chain saw operator cleared up any timber disturbed by the excavating.

A total of 5 trenches were dug. Two utilized parts of existing roads on licence 3987. These were trenches 3 and 4. In both cases the front end loader was used to excavate 1 to 2 metres into the cut-bank to develop very good continuous exposures of bedrock. Trenching totalled 1,060 m., road-cuts 120 m.

On licence 3992 a series of trenches, all grouped as Trench 5, were excavated along the existing bulldozed seismic line. This location was used for two reasons: first, it was ideally situated geologically; second, work here did not damage the environment.

In addition to the above trenches, four road cuts were made. These were areas where coal seams were poorly exposed along existing roads. Using the front end bucket, the operator excavated up to 3 m. into the bank to provide, in most cases, good exposures.

Before any of the above road cuts were made, the chain saw operator felled and bucked any trees which would be undermined by the excavating.

Geological Mapping

Geology was mapped as soon as sufficient trench was completed to permit safe working conditions. This was essential because water seeps in various parts of the trenches would cause sluffing of the walls soon after they were exposed.

Geology was mapped in notebook form, then plotted on a map

on a scale of 1:500. An attempt was made to plot all data while in the trenches but this proved futile because the writer's hands were so covered in brown mud or coal that the paper quickly took on the colour of the surroundings and became illegible. The "Duksbak" waterproof notebook proved up to the task.

A compass and nylon chain survey was made along the road on coal licence 3987 tying all trenches together. This survey was plotted on a scale of 1:1000 (Figure 9). A similar survey was made from the capped gas near the southeast corner of licence 3992 to trench 5. This road was not completely mapped on the original base map manuscript.

Sampling

All significant coal zones were sampled. Seams approximately 75 cm. or greater were sampled if they were either free from or contained very minor partings. Several coal zones contained two or more coal seams separated by shale or mudstone beds. In these cases, only the coal sections were sampled and combined as one sample.

GEOLOGY

Regional Geology

The Rocky Mountains consist of a complex series of closely folded, faulted and thrustured blocks of sedimentary rocks ranging in age from Proterozoic to Lower Cretaceous. To the east of

the Rockies the deformation decreases gradually, resulting in the formation of low amplitude simple folds.

Lower Cretaceous coal bearing beds outcrop extensively along the Foothills of Alberta and Northeast British Columbia. They occur in sediments assigned to the Blairmore, Bullhead, and Fort St. John groups.

Bullhead and Fort St. John Formations outcrop in the Pine River area on and in the vicinity of coal licence 3986-3993. In this area they occur in a broad anticlinorium near the eastern limit of the strong Foothills deformation. Considerable literature is available on the Foothills belt of northeast British Columbia. This includes:

- a) Regional studies by the Geological Survey of Canada and published as Stott (1968) and Stott (1971).
- b) Several localized stratigraphic and mapping projects have been completed within the area by both the British Columbia Department of Mines and the Geological Survey of Canada. These are documented by Hughes (1964), Hughes (1967), McLean and Kindle (1950), McKechnie (1955), and Spivak (1944).
- c) A series of compilation maps were prepared by the British Columbia Department of Mines by Gilchrist (1978).

The above literature is listed under "References" in this report.

Local Geology

Reconnaissance geology conducted on these coal licences in 1979 found that outcrop was generally sparse and restricted to cliffs, road cuts and an occasional creek gully. For this reason, the trenching program was proposed for 1980 to expose favourable geology and related coal seams.

All trenches and road cuts exposed similar geology. The rocks may be grouped as follows:

(a) Mudstone (claystone), siltstone, and sandstone - these are all fine grained rocks, brown to grey brown, usually soft, calcareous and finely bedded to massive. The two extreme ends of this rock group are distinctive. The mudstone is consistently soft, dark brown to yellow-brown, calcareous and massive to concretionary. The sandstone is brown to grey-brown on the weathered surface, grey on fresh surfaces, fine grained, finely bedded, calcareous, and hard. Weathered sandstone is soft, yellow-brown, and approaches mudstone in appearance. In many cases faint fine bedding is preserved. Coaly plant remains and fine coal seams occur on some bedding planes. Locally, ripple marks are preserved.

The writer reserved siltstone for very fine grained, grey, usually massive beds, often shaly. These rocks are very fine grained but coarser than mudstone. They are non-concretionary and usually non-calcareous.

All rocks in this group are strongly weathered. Hard, resistant sandstone beds are few. As a result, in field note taking, terms such as silty mudstone, silty siltstone, sandy siltstone, etc. were used based on the fine gritty nature of the weathered rocks. In plotting the geology, these various rocks were assigned to definite rock types.

(b) Carbonaceous shale - very dark grey to black, strong shaly texture, with or without fine to coarse coal seams. When appreciable coal seams are present, the rocks were mapped as coaly shale.

(c) Coal - always soft, crumbly, weathered, but usually with bright vitrain bands. It may contain bands of carbonaceous and/or coaly shales.

Structural Geology

Two tightly folded structures were noted in the trenches. At the southwest end of trench no.4 an anticline is well defined by the new trenching. The axial plane of the fold strikes northwesterly, with the limbs dipping at 15° - 20° to the northeast and 55° to the southwest. Due to a scarcity of outcrop, this structure is poorly defined. However, it is thought to persist to the southeast as a local "wrinkle" on the otherwise westerly dipping limb of the Willow Creek anticline. Evidence for this is the apparent displacement to the east of the Blue Sky conglomerate, which marks the Gething Fm. - Moosebar Fm. contact. The contact location as exposed in trench no.3 is thought to be due to repetition of the geology by the above fold.

A northwest trending syncline is indicated in trench 5 at the intersection of the access road with the seismic line. To the southwest of this point, all dips are 20° - 40° to the northeast, while immediately east of this point, dips are 45° - 70° to the southwest. Unfortunately, due to deep overburden, the trough of the fold could not be exposed. The fact that the coal seam exposed in this area does not appear to the east of the inferred axial plane suggests faulting on or near the axial plane.

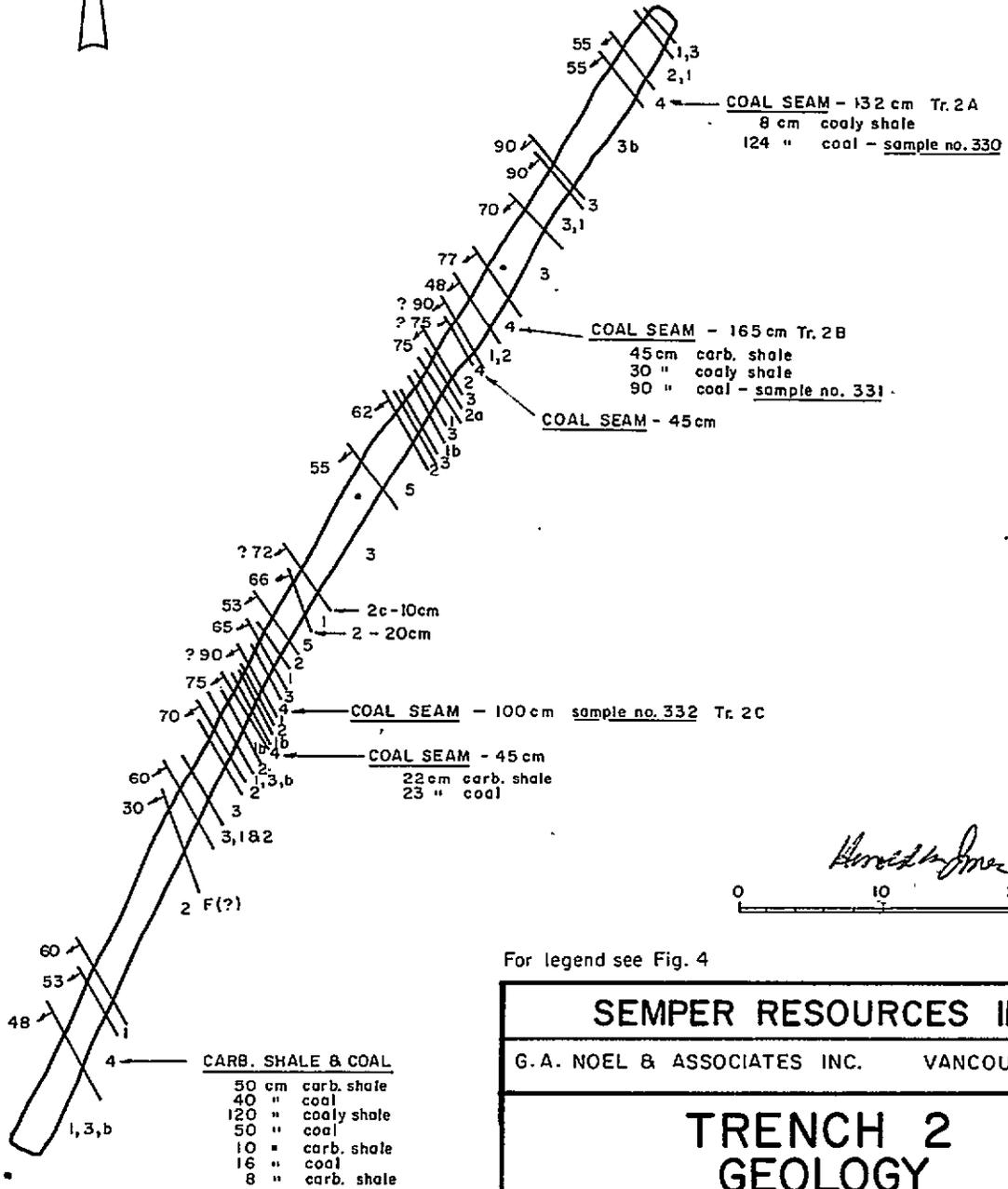
In trench no.3, approximately 15' m. south of the road switch-back, a northwest trending fault shows a 1.5 m. uplift of strata on its southwest side. Beds adjacent to the fault show warping.

Dips measured on foot and hanging walls of some seams differ, in some cases, by a considerable amount. This may be due to tight folding or surface slumping.(?)



Test pit in overburden 11x2x4m
no outcrop

Test pit in overburden 4.5x2x4m
no outcrop



For legend see Fig. 4

SEMPER RESOURCES INC.

G. A. NOEL & ASSOCIATES INC. VANCOUVER, B.C.

**TRENCH 2
GEOLOGY**

COAL LICENCES 3986-3993

PINE RIVER AREA, B.C.

LIARD M.D.

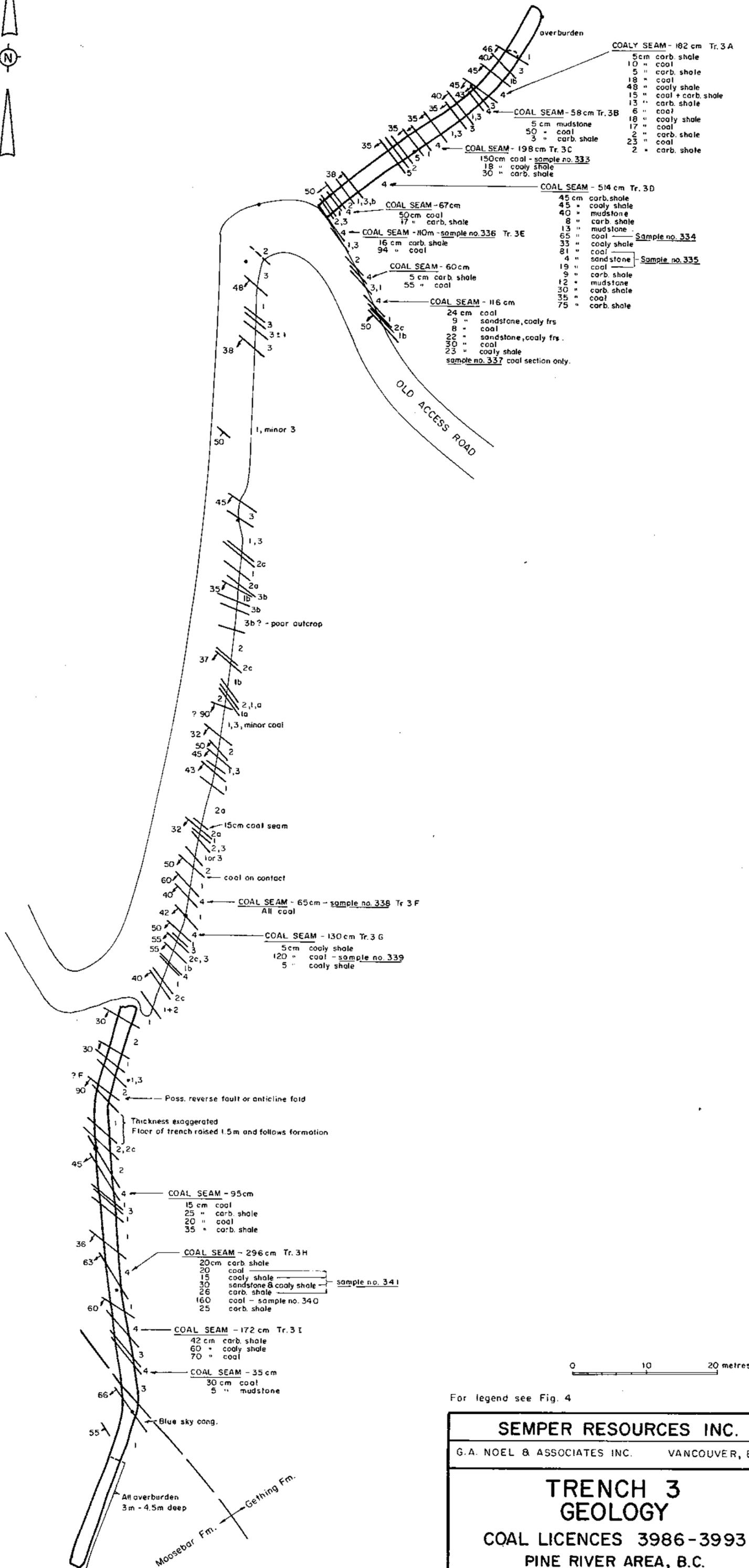
PR - PINE RIVER 80(1)A

SCALE 1:500

AUGUST 1980

FIG 5

H. JONES



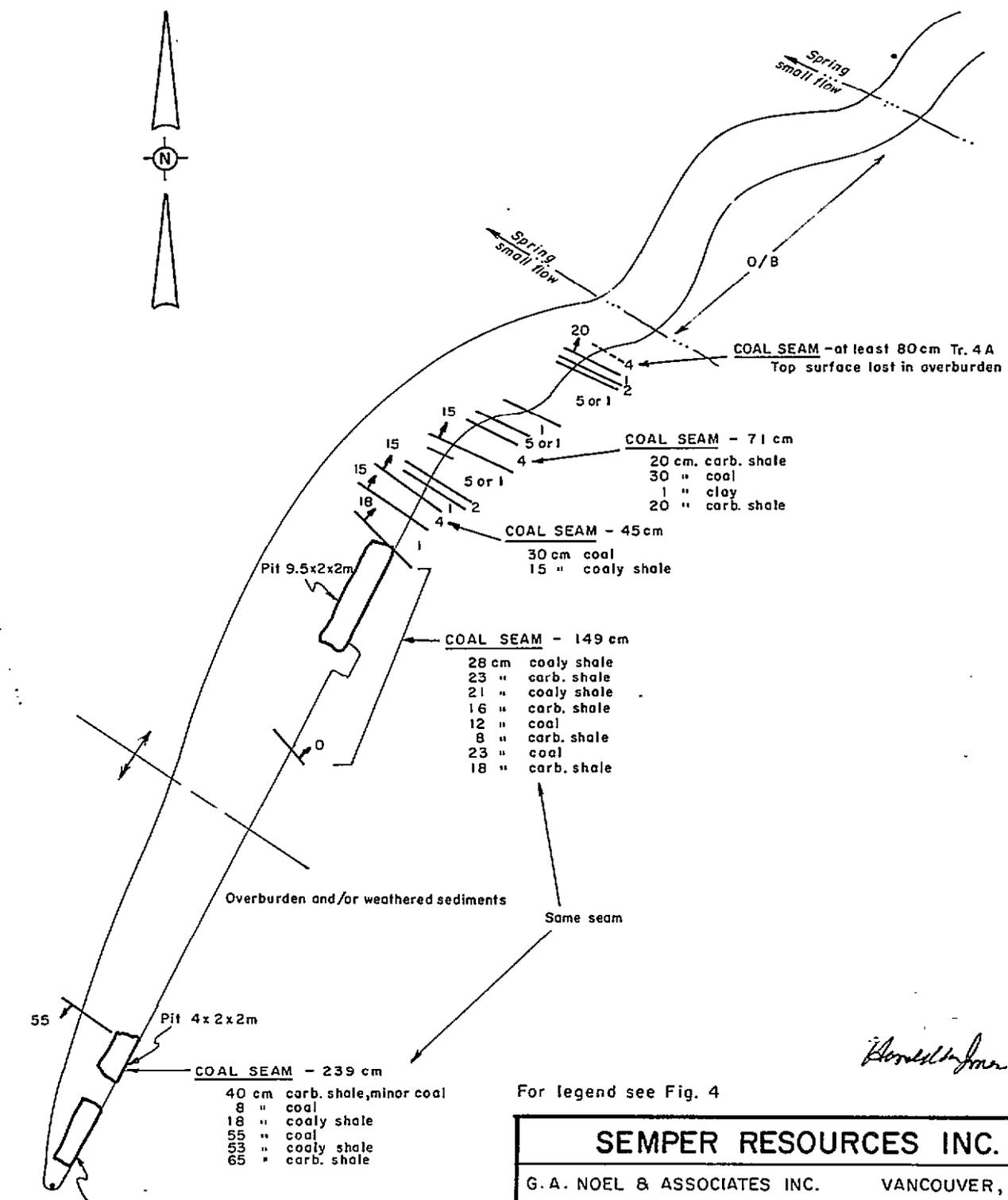
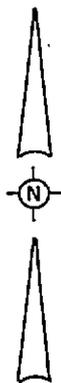
SEMPER RESOURCES INC.
 G.A. NOEL & ASSOCIATES INC. VANCOUVER, B.C.

**TRENCH 3
 GEOLOGY**

COAL LICENCES 3986-3993
 PINE RIVER AREA, B.C.
 LIARD M.D.
PR - PINE RIVER 80 (1A)

SCALE 1:500	AUGUST 1980	FIG. 6
H. JONES		

Should to Jones



For legend see Fig. 4

SEMPER RESOURCES INC.

G. A. NOEL & ASSOCIATES INC.

VANCOUVER, B. C.

**TRENCH 4
GEOLOGY**

COAL LICENCES 3986 - 3993

PINE RIVER AREA, B. C.

LIARD M. D.

PR-PINE RIVER 80(1)A

SCALE 1:500

AUGUST 1980

FIG. 7

H. JONES



RESULTS

Coal Zones

Numerous coal bearing sections were encountered in all trenches. These are shown on Figures 4 - 9 as coal seams. They more correctly should be called coal zones since they may contain not only coal seams but coaly shale, shale, mudstone, etc.

An attempt was made in the field to measure the true thickness of all coal zones and coal seams. Due to variable attitudes of the coal zones in relation to the strike of the trenches, variations in dip of foot and hanging walls, etc. thicknesses recorded may be subject to some error.

The following table lists all significant coal zones and their contained coal seams. Only coal zones approximately 75 cm. or greater are listed.

The character of each coal zone is described. Sections listed as coal are essentially all coal with no significant partings unless specified. All coal zones are described in ascending order from the apparent footwall to hanging wall. For convenience, each seam is numbered according to which trench it is located in and its position in the trench relative to its northeast end, e.g. TR1B is a seam in trench no.1, and second from the northeast end (see Figures 4 - 9).

<u>Coal Zone</u>	<u>True width of Zone (cm)</u>	<u>Dip</u>	<u>Character of Coal Zone</u>	<u>Total Coal in Zone (cm) and Sample No.</u>
Tr 1A	210	35°SW	All coal	216
Tr 1B	120	40°SW	113 cm. coal seam 7 cm. carb. shale	113
Tr 1C	237	45°SW	14cm coaly shale 13 cm coal seam 18 cm coaly sandstone (50% coal) 110 cm coal seam 3 cm carb. shale 64 cm coal seam 15 cm carb shale	205
Tr 1E	95	35°-50°SW	All coal seam	95
Tr 1F	85	43°SW	20 cm carb. shale 65 cm coal seam	65
Tr 2A	132	55°SW	8 cm coaly shale 124 cm coal seam -- may have 15 cm coaly shale at upper contact - badly weathered	109-124
Tr 2B	165	48°-77°SW	45 cm carb. shale 30 cm coaly shale 90 cm coal seam	90
Tr 2C	100	50°-90°SW	All coal seam - Dip is not clear	100
Tr 3C	198	35°SW	150 cm coal seam 18 cm coaly shale 30 cm carb. shale	150
Tr 3D	514	35°SW	Within this wide seam (see Figure) have the following section 65 cm coal seam 38 cm coaly shale 81 cm coal seam 44cm sandstone 19 cm coal	146
Tr 3G	130	42°-50°SW	5 cm coaly shale 120 cm coal seam 5 cm coaly shale	120

<u>Coal Zone</u>	<u>True width of Zone (cm)</u>	<u>Dip</u>	<u>Character of Coal Zone</u>	<u>Total Coal in Zone (cm) and Sample No.</u>
Tr 3H	296	36°-63°SW	20 cm carb shale 20 cm coal seam 15 cm coaly shale 30 cm sandstone & coaly shale 26 cm carb shale 160 cm coal seam 25 cm carb shale	160
Tr 3I	172	60°	42 cm carb shale 60 cm coaly shale 70 cm coal seam	70
Tr 4A	80+	20°	80 cm coal seam exposed immediately beneath overburden. Hanging wall eroded.	80+
Tr 5A	431	27°	50 cm carb shale 40 cm sandstone, coaly plant & remains 215 cm coal seam 40 cm carb shale 20 cm coal seam 50 cm carb shale 16 coal seam	215
Tr 5B1			(60 cm carb shale (90 cm coal seam (5 cm mud- from surface (45 cm coal seam (8 cm carb shale (32 cm coal seam (7 cm carb shale 25 cm sandstone 50 cm carb shale & mudstone	167
	247	40°		
Tr 5B2		40°	(140 cm coal seam (23 cm coaly shale (280 cm coal seam (70 cm coaly shale (90 cm coal seam (20 cm carb shale	510
	623			
Tr 5C	338	27°	39 cm coal with 2 cm parting 9 cm carb shale 9 cm coal 41 cm carb shale 210 cm coal 30 cm coaly shale	258

In addition to the above coal zones and coal seams others are exposed in road cuts 1, 2 and 4. The first two should correlate with ones seen in trench no.1 and are thought to be the northwestern continuation of seams Tr 1B and Tr 1C.

Road cut no.4 exposed a one metre (+) bank of coal resting on glacial boulder till. This coal must have sluffed from higher on the hill and is most likely the southeast continuation of seam Tr 5B, which should be in subcrop in the vicinity of road cut no.4.

Samples and Assays

Twenty samples were taken from the various trenches. Their locations are shown on Figures 4 - 8. In all cases, the coal sampled was soft and weathered although, in many cases, bright and shiny. The character of the coal is somewhat lowered by the effects of weathering.

The following are lists of all assay results and sample descriptions:

Assay Results

<u>Sample No.</u>	<u>As Rec'd.</u>	<u>Dry Basis</u>			<u>BTU/lb.</u>	<u>Sulphur</u>
	<u>Moisture</u>	<u>Ash</u>	<u>Volatile</u>	<u>Fixed Carbon</u>		
326	21.69	43.31	22.11	34.58	6562	0.44
327	20.86	13.18	29.57	57.25	10409	0.42
328	29.17	14.34	33.46	52.20	9844	0.63
329	19.28	14.39	30.96	54.65	9937	0.49
330	24.91	18.09	31.89	50.02	9137	0.48
331	18.38	10.30	31.37	58.33	11227	0.59
332	26.45	15.71	31.60	52.69	9900	0.62
333	9.06	61.42	15.46	23.12	4120	0.61
334	13.06	50.85	18.84	30.31	5557	0.67
335	21.08	18.76	29.49	51.75	9931	0.37
336	15.09	14.79	27.54	57.67	11189	0.28
337	12.32	22.27	21.57	56.16	10097	0.28
338	15.41	7.76	28.59	63.65	11517	0.69
339	20.60	9.91	38.15	51.94	10421	0.62
340	22.73	12.38	31.87	55.75	10419	0.56
341	15.65	62.21	16.56	21.23	3409	0.34
342	6.18	15.88	16.23	67.89	12761	0.80
343	16.62	10.19	20.47	69.34	12799	0.63
344	34.53	12.54	30.91	56.55	10280	0.33
345	24.72	10.55	31.51	57.94	10712	0.49

<u>Sample Descriptions</u>					
<u>Sample No.</u>	<u>Trench</u>	<u>Seam</u>	<u>Width</u> (cm)		<u>Description</u>
326	1	Tr 1E	95		all coal
327	1	Tr 1C	205		Includes 18cm coaly sandstone and 3cm carb shale.
328	1	Tr 1B	113		all coal
329	1	Tr 1A	210		includes 4cm parting
330	2	Tr 2A	111		all coal
331	2	Tr 2B	90		all coal
332	2	Tr 2C	100		all coal
333	3	Tr 3C	150		all coal
334	3	Tr 3D	65		all coal, part of wide zone
335	3	Tr 3D	100		separated from above by 38cm coaly shale, sample includes 4cm sandstone
336	3	Tr 3E	94		all coal
337	3	-	62		combination of three seams - 24, 8 & 30 cm
338	3	Tr 3F	65		all coal
339	3	Tr 3G	120		all coal
340	3	Tr 3H	160		all coal
341	3	Tr 3H	91		poor part of seam Tr3, mixture coal & coaly shale
342	5	Tr 5C	210		all coal
343	5	Tr 5B1	167		all coal, omitted partings of 5cm & 8cm
344	5	Tr 5B2	510		all coal, omitted partings of 23 cm & 70cm
345	5	Tr 5A	215		all coal

Correlation of Coal Seams

At the time of writing, correlation of coal seams is not completed. The cyclical nature of the sediments and coal seams, the apparent variation of sediments along strike, and the variations in thickness and character of the coal zones made correlation difficult. This is compounded by the complete lack of outcrop between trenches and road cuts.

On coal licences 3987 coal zones Tr 1B, R2A and Tr 2B are thought to be the same, as are Tr 1C, R2B and Tr 2C (see Figure 9). Coal zone Tr 1D appears similar to Tr 2D. The

character of the above coal zones and their contained coal seams are similar but their geology does not necessarily correlate very well. The latter could be due to rapid changes along strike due to the lensing out of sedimentary beds.

The assay certificates accompany the report in Appendix I. A review of these results indicate a wide variation in the character of the coals.

Two assays are very encouraging. These are samples 342 and 343 which were taken from Trench 5, coal zones Tr 5B1 and Tr 5C. These are two of the more interesting zones, both because of favourable dips and widths. These two assays are in the approximate range of metallurgical coal now being shipped overseas.

Samples 344, which is from a part of the same coal zone as sample 343, is somewhat lower in grade. However, this could be upgraded in washing.

In summary, coal zones Tr 5B1, B2 & C are indicated by assay results to contain coal seams of metallurgical grade.

Assays from the other seams are somewhat lower in grade. However, since these results are from weathered, unwashed coal, they are lower than from fresh coal. Many of the seams, with treatment, could probably be upgraded to either metallurgical coal or thermal coal.

RECLAMATION

Since the work program is planned to be on-going, most trenches were left open so that company personnel and others could examine the coal zones and geology.

A limited amount of back-filling was carried out. All deep test pits in overburden were filled, as were the southwest portion of trench no.1, the northeast end (beyond coal seam Tr 5A) of trench 5, and that portion of trench 5 between coal seams Tr 5B to Tr 5A. It is understood by Semper Resources Inc. that the remaining open trenches must be reclaimed at a later date.

CONCLUSIONS

The results of the trenching program indicate that appreciable amounts of coal are present within coal licences 3987. Each trench intersected a number of coal zones, some or all of which are continuous throughout the trenching area. Due to difficulties in correlating the various zones, it is not certain how many are present. Some, such as at the southwest end of trench 4, are definitely repeated by local folding. Some of the other numerous coal exposures could also be repeated by tight folding or faulting. It is probably safe to assume that there are at least four coal zones on licence 3987 with continuity which contain coal seams 1 metre or more wide. Whether these same seams are repeated by structural events will only be known by conducting further exploration.

Three very significant coal zones were encountered on licence 3993. These are shown on Figure 8 as Tr 5A, B & C. Zone

Tr 5A is 431 cm. wide containing a 215 cm. seam of clean coal. Zone Tr 5B is 945 cm. wide and contains one 280 cm. seam of clean coal and five lesser seams totalling 397 cm. of coal. Coal zone Tr 5C contains 210 cm. of clean coal. These combined zones contain seams totalling 11 metres of coal. They dip at 27° - 40° as compared to those on licence 3987 which dip from 40° - 60° .

A probable fault occurs slightly east of coal zone Tr 5A on or near the axial plane of a synclinal fold. With this structure setting the above seams could be repeated if the eastern section was down faulted. More work is definitely warranted in this area to explore for these seams.

While it is far too early to calculate tonnages of coal, zones Tr 5B1, B2 and Tr 5C could contain a total of 1.5 million tons. This is based on a possible strike length of 800 metres and a dip extension of 140 m. and 213 m. respectively to the possible fault. Coal seam Tr 5A is not included in this calculation since its down dip extent could be very limited if it is terminated against a fault.

Assay results indicate that the character of coal is variable as would be expected from weathered, unwashed coal. However, samples from coal zone Tr 5B1 and C assay in the range of metallurgical coal* now being exported. That from seam Tr 5B2 is lower grade but by beneficiation could probably be upgraded. Most of the other seams also could probably be upgraded to thermal or metallurgical grade coal.

*based on Proximate analysis. Coking characteristics not known.

It is concluded that these coal licences contain significant amounts of coal in seams of mineable widths, at least two of which are of metallurgical grade, located on the only rail line in northeastern British Columbia. These two factors alone make this property worthy of further exploration. Also work has been done on only a very small part of the total coal licences area. Coal is known to be present over a much larger area than has been explored to date.

RECOMMENDATIONS

It is recommended that additional exploration be conducted on coal licences 3990 - 3993 inclusive to further test the encouraging seams located in trench 5. This work should include backhoe trenching and diamond drilling.

COST ESTIMATE OF PROPOSED WORK

Stage I

Backhoe trenching - John Deere 450 @ \$38/hr. one month, say	\$ 15,000.00
Diamond drilling - 1220 metres H.Q. @ \$148/m. including camp costs	180,560.00
Bulldozer - for drill roads and moves, say one month	10,000.00
Vehicle, 4x4 @ \$900/mo + fuel, 1½ months	1,500.00
Assaying & metallurgical tests	10,000.00
Geophysical down hole logging	12,000.00
Geology, engineering, supervision, 1½ months @ \$250/day	11,250.00

Travel	1,000.00
Compilation of all data, report writing, etc.	<u>2,000.00</u>
	\$243,310.00
Contingencies @ 15%	<u>36,496.00</u>
	\$279,806.00
Say	<u>\$280,000.00</u>

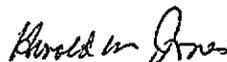
The cost of Stage I could be reduced only if backhoe trenching were postponed and the amount of drilling reduced. Neither are recommended.

Stage II

Contingent on the results of Stage I, the second stage would be mostly diamond drilling and would require a much larger expenditure. Assuming 20 holes totalling 3600 metres of H.Q. drilling @ \$148/metre the total cost would be \$532,000.00

Say \$550,000.00

Respectfully submitted,



August 14, 1980

HAROLD M. JONES, P.Eng.

REFERENCES

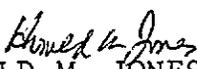
- Gilchrist, R.D. (1978): Coal Resources, Peace River Coal Field, Northeastern British Columbia; B.C. Min. of Mines and Pet. Resources, Preliminary Maps.
- Hughes, J.E. (1964): Jurassic and Cretaceous Strata of the Bullhead Succession in the Peace and Pine River Foothills; B.C. Dept. of Mines and Pet. Res., Bull: No.51.
- Hughes, J.E. (1967): Geology of the Pine Valley, Mount Wabi to Solitude Mountain, Northeastern British Columbia; B.C. Dept. of Mines & Pet. Res., Bull. No.52.
- Jones, H.M. (1979): Report on the Geological Mapping Program on Parts of Coal Licences 3986-3993 inclusive. Pine River Area, Liard M.D.; Assess. Report.
- McLearn, F.H. and Kindle, E.D. (1950): Geology of Northeastern British Columbia; Geol. Surv. Can., Mem.259.
- McKecknie, N.D. (1955): Coal Reserves of the Hasler Creek-Pine River Area; B.C. Dept. of Mines, Bull. No.36.
- Stott, D.A. (1960): Lower Cretaceous Bullhead and Fort St. John Groups, between Smokey and Peace Rivers, Rocky Mountain Foothills, Alberta and British Columbia; Geol. Surv. Can. Bull. No.152, pp.279.
- Stott, D.A. (1971): Lower Cretaceous Bullhead Group between Bullmoose Mountain and Tetsa River, Rocky Mountain Foothills, Northeastern British Columbia; Geol. Surv. Can., Open File Report.
- Stott, D.A. (1974): Lower Cretaceous Coal Measures of Foothills of West Central Alberta and Northeastern British Columbia; C.I.M. Bull. Sept. 1974.

CERTIFICATE

I, Harold M. Jones, of the City of Vancouver, British Columbia do hereby certify that:

1. I am a Consulting Engineer, and a partner in the firm of G.A. Noel & Associates, Inc.
2. I am a graduate of the University of British Columbia in Geological Engineering, 1956.
3. I am a registered Professional Engineer of the Province of British Columbia and also a member of the Canadian Institute of Mining and Metallurgy.
4. I have practised my profession continuously since 1956 in mining exploration in British Columbia, Saskatchewan, Yukon and Northwest Territories, Alaska, Arizona and Australia.
5. I have reviewed all the data listed under References in this report as well as worked on coal licences 3986 - 3993 inclusive from July 3 to August 3, 1980.
6. I have not received, nor do I expect to receive any interest, direct or indirect in the coal licences or in the securities of Semper Resources Inc.
7. Semper Resources Inc. is hereby given permission to reproduce this report, or any part of it, for the purposes of a financial prospectus; provided, however, that no portion may be used out of context in such a manner as to convey a meaning differing materially from that set out in the whole.

DATED at VANCOUVER, B.C. this 13th day of August, 1980.


HAROLD M. JONES, P.Eng.
G. A. NOEL & ASSOCIATES INC.
CONSULTING GEOLOGISTS

A P P E N D I X I

Summary of Expenses

APPENDIX I

SUMMARY OF EXPENSES

Wages:

H.M. Jones, P.Eng. Geologist-supervisor - 33½ days @ \$250/day	\$8,375.00	
C. Patterson Chain saw operator 32½ days @ \$100/day	3,250.00	
D. Brewer part-time cook & expeditor	<u>500.00</u>	\$12,125.00

Backhoe Trenching:

S. Brewer, Contractor - 268 hours @ \$38/hr.	\$10,184.00	
- mobilization: Vernon-Chetwynd & return	1,900.00	
- equipment damage due to river crossing	<u>500.00</u>	12,584.00

Camp - food 900.00

Field Equipment 723.00

Transportation:

4x4 vehicle @ \$675/mo. & canopy rent & gas	\$ 1,116.00	
outboard motor & boat	<u>150.00</u>	1,266.00

Camp Servicing - vehicle expenses, etc. 302.00

Assays - 20 proximate analysis @ \$35/assay 700.00

Mobilization & Transportation:

Vancouver-Chetwynd return - 2 men 464.00

Report Preparation including drafting 1,550.00

\$30,614.00

Approved by Jones

A P P E N D I X I I

Assay Certificates

COMMERCIAL TESTING & ENGINEERING

DIVISION OF PEABODY INTERNATIONAL CORPORATION (CANADA) LTD.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

▶ G. A. NOEL & ASSOCIATES INC.
622-510 W. Hastings Street
VANCOUVER, BC
V6B 1L8

August 14, 1980

Sample identification
by
Commercial Test. & Engr. Co.

Kind of sample reported to us Coal - #326
Sample taken at -----
Sample taken by -----
Date sampled -----
Date received August 5/80

Analysis report no. 64-19607

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	21.69	xxxxx
% Ash	33.92	43.31
% Volatile	17.31	22.11
% Fixed Carbon	27.08	34.58
	<u>100.00</u>	<u>100.00</u>
BTU	5139	6562
% Sulphur	0.34	0.44

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING

Division of Peabody International Corporation (Canada) Ltd.

S. Morrin
S. Morrin
Regional Manager



Charter Member

COMMERCIAL TESTING & ENGINEERING

DIVISION OF PEABODY INTERNATIONAL CORPORATION (CANADA) LTD.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

▶ G. A. NOEL & ASSOCIATES INC.
622-510 W. Hastings Street
VANCOUVER, BC
V6B 1L8

August 14, 1980

Sample identification
by
Commercial Test. & Engr. Co.

Kind of sample reported to us Coal - #327
Sample taken at ----
Sample taken by ----
Date sampled ----
Date received August 5/80

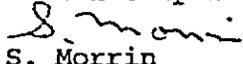
Analysis report no. 64-19608

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	20.86	xxxxxx
% Ash	10.43	13.18
% Volatile	23.40	29.57
% Fixed Carbon	45.31	57.25
	<u>100.00</u>	<u>100.00</u>
BTU	8238	10409
% Sulphur	0.33	0.42

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING

Division of Peabody International Corporation (Canada) Ltd.


S. Morrin
Regional Manager



Charter Member

COMMERCIAL TESTING & ENGINEERING

DIVISION OF PEABODY INTERNATIONAL CORPORATION (CANADA) LTD.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

August 14, 1980

G. A. NOEL & ASSOCIATES INC.
622-510 W. Hastings Street
VANCOUVER, BC
V6B 1L8

Sample identification
by
Commercial Test. & Engr. Co.

Kind of sample reported to us Coal - #328

Sample taken at -----

Sample taken by -----

Date sampled -----

Date received August 5/80

Analysis report no. 64-19609

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	29.17	xxxxxx
% Ash	10.16	14.34
% Volatile	23.70	33.46
% Fixed Carbon	36.97	52.20
	<u>100.00</u>	<u>100.00</u>
BTU	6973	9844
% Sulphur	0.45	0.63

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING

Division of Peabody International Corporation (Canada) Ltd.

S. Morrin
S. Morrin
Regional Manager



Charter Member

COMMERCIAL TESTING & ENGINEERING

DIVISION OF PEABODY INTERNATIONAL CORPORATION (CANADA) LTD.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

August 14, 1980

G. A. NOEL & ASSOCIATES INC.
622-510 W. Hastings Street
VANCOUVER, BC
V6B 1L8

Sample identification
by
Commercial Test. & Engr. Co.

Kind of sample reported to us Coal - #329
Sample taken at -----
Sample taken by -----
Date sampled -----
Date received August 5/80

Analysis report no. 64-19610

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	19.28	XXXXX
% Ash	11.62	14.39
% Volatile	24.99	30.96
% Fixed Carbon	44.11	54.65
	<u>100.00</u>	<u>100.00</u>
BTU	8021	9937
% Sulphur	0.40	0.49

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING

Division of Peabody International Corporation (Canada) Ltd.

S. Morrin
S. Morrin
Regional Manager



Charter Member

BILLINGS, MT • BIRMINGHAM, AL • CHARLESTON, WV • CLARKSBURG, WV • CLEVELAND, OH • CONNEAUT, OH • DENVER, CO • GOLDEN, CO • HELPER, UT • HENDERSON, KY • HOUSTON, TX • JASPER, AL
MIDDLESBORO, KY • MOBILE, AL • NEW BETHLEHEM, PA • NEW ORLEANS, LA • NORFOLK, VA • PALISADE, CO • PIKEVILLE, KY • SALINA, UT • SO. HOLLAND, IL • TOLEDO, OH • VANCOUVER, B.C. CAN.
PRINTED IN U.S.A.

COMMERCIAL TESTING & ENGINEERING

DIVISION OF PEABODY INTERNATIONAL CORPORATION (CANADA) LTD.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

G. A. NOEL & ASSOCIATES INC.
622-510 W. Hastings Street
VANCOUVER, BC
V6B 1L8

August 14, 1980

Sample identification
by
Commercial Test. & Engr. Co.

Kind of sample reported to us Coal - #330
Sample taken at -----
Sample taken by -----
Date sampled -----
Date received August 5/80

Analysis report no. 64-19611

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	24.91	XXXXXX
% Ash	13.58	18.09
% Volatile	23.95	31.89
% Fixed Carbon	37.56	50.02
	<u>100.00</u>	<u>100.00</u>
BTU	6861	9137
% Sulphur	0.36	0.48

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING

Division of Peabody International Corporation (Canada) Ltd.

S. Morrin
S. Morrin
Regional Manager



Charter Member

COMMERCIAL TESTING & ENGINEERING

DIVISION OF PEABODY INTERNATIONAL CORPORATION (CANADA) LTD.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

August 14, 1980

G. A. NOEL & ASSOCIATES INC.
622-510 W. Hastings Street
VANCOUVER, BC
V6B 1L8

Sample identification
by

Commercial Test. & Engr. Co.

Kind of sample reported to us Coal - #331
Sample taken at ----
Sample taken by ----
Date sampled ----
Date received August 5/80

Analysis report no. 64-19612

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	18.38	XXXXXX
% Ash	8.41	10.30
% Volatile	25.60	31.37
% Fixed Carbon	47.61	58.33
	<u>100.00</u>	<u>100.00</u>
BTU	9163	11227
% Sulphur	0.48	0.59

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING

Division of Peabody International Corporation (Canada) Ltd.

S. Morrin
S. Morrin
Regional Manager



Charter Member

COMMERCIAL TESTING & ENGINEERING

DIVISION OF PEABODY INTERNATIONAL CORPORATION (CANADA) LTD.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

G. A. NOEL & ASSOCIATES INC.
622-510 W. Hastings Street
VANCOUVER, BC
V6B 1L8

August 14, 1980

Sample identification
by
Commercial Test. & Engr. Co.

Kind of sample reported to us Coal - #332
Sample taken at ----
Sample taken by ----
Date sampled ----
Date received August 5/80

Analysis report no. 64-19613

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	26.45	XXXXX
% Ash	11.55	15.71
% Volatile	23.24	31.60
% Fixed Carbon	38.76	52.69
	<u>100.00</u>	<u>100.00</u>
BTU	7281	9900
% Sulphur	0.46	0.62

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING

Division of Peabody International Corporation (Canada) Ltd.

S. Morrin
S. Morrin
Regional Manager



Charter Member

BILLINGS, MT · BIRMINGHAM, AL · CHARLESTON, WV · CLARKSBURG, WV · CLEVELAND, OH · CONNEAUT, OH · DENVER, CO · GOLDEN, CO · HELPER, UT · HENDERSON, KY · HOUSTON, TX · JASPER, AL
MIDDLESBORO, KY · MOBILE, AL · NEW BETHLEHEM, PA · NEW ORLEANS, LA · NORFOLK, VA · PALISADE, CO · PIKEVILLE, KY · SALINA, UT · SD. HOLLAND, IL · TOLEDO, OH · VANCOUVER, B.C. CAN.

PRINTED IN U.S.A.

COMMERCIAL TESTING & ENGINEERING

DIVISION OF PEABODY INTERNATIONAL CORPORATION (CANADA) LTD.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

August 14, 1980

G. A. NOEL & ASSOCIATES INC.
622-510 W. Hastings Street
VANCOUVER, BC
V6B 1L8

Sample identification
by
Commercial Test. & Engr. Co.

Kind of sample reported to us Coal - #333
Sample taken at ----
Sample taken by ----
Date sampled ----
Date received August 5/80

Analysis report no. 64-19614

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	9.06	xxxx
% Ash	55.86	61.42
% Volatile	14.06	15.46
% Fixed Carbon	21.02	23.12
	<u>100.00</u>	<u>100.00</u>
BTU	3747	4120
% Sulphur	0.55	0.61

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING

Division of Peabody International Corporation (Canada) Ltd.

S. Morrin
S. Morrin
Regional Manager



Charter Member

BILLINGS, MT · BIRMINGHAM, AL · CHARLESTON, WV · CLARKSBURG, WV · CLEVELAND, OH · CONNEAUT, OH · DENVER, CO · GOLDEN, CO · HELPER, UT · HENDERSON, KY · HOUSTON, TX · JASPER, AL
MIDDLESBORO, KY · MOBILE, AL · NEW BETHLEHEM, PA · NEW ORLEANS, LA · NORFOLK, VA · PALISADE, CO · PIKEVILLE, KY · SALINA, UT · SO. HOLLAND, IL · TOLEDO, OH · VANCOUVER, B.C. CAN.

PRINTED IN U.S.A.

Original Copy Watermarked
For Your Protection

COMMERCIAL TESTING & ENGINEERING

DIVISION OF PEABODY INTERNATIONAL CORPORATION (CANADA) LTD.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

G. A. NOEL & ASSOCIATES INC.
622-510 W. Hastings Street
VANCOUVER, BC
V6B 1L8

August 14, 1980

Sample identification
by

Commercial Test. & Engr. Co.

Kind of sample reported to us Coal - #334
Sample taken at ----
Sample taken by ----
Date sampled ----
Date received August 5/80

Analysis report no. 64-19615

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	13.96	XXXXXX
% Ash	43.75	50.85
% Volatile	16.21	18.84
% Fixed Carbon	26.08	30.31
	<u>100.00</u>	<u>100.00</u>
BTU	4781	5557
% Sulphur	0.58	0.67

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING

Division of Peabody International Corporation (Canada) Ltd.

S. Morrin
S. Morrin
Regional Manager



Charter Member

BILLINGS, MT - BIRMINGHAM, AL - CHARLESTON, WV - CLARKSBURG, WV - CLEVELAND, OH - CONNEAUT, OH - DENVER, CO - GOLDEN, CO - HELPER, UT - HENDERSON, KY - HOUSTON, TX - JASPER, AL
MIDDLESBORO, KY - MOBILE, AL - NEW BETHLEHEM, PA - NEW ORLEANS, LA - NORFOLK, VA - PALISADE, CO - PIKEVILLE, KY - SALINA, UT - SO. HOLLAND, IL - TOLEDO, OH - VANCOUVER, B.C. CAN.
PRINTED IN U.S.A.

COMMERCIAL TESTING & ENGINEERING

DIVISION OF PEABODY INTERNATIONAL CORPORATION (CANADA) LTD.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

August 14, 1980

G. A. NOEL & ASSOCIATES INC.
622-510 W. Hastings Street
VANCOUVER, BC
V6B 1L8

Sample identification
by
Commercial Test. & Engr. Co.

Kind of sample reported to us Coal - #335
Sample taken at ----
Sample taken by ----
Date sampled ----
Date received August 5/80

Analysis report no. 64-19616

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	21.08	xxxxxx
% Ash	14.81	18.76
% Volatile	23.27	29.49
% Fixed Carbon	40.84	51.75
	<u>100.00</u>	<u>100.00</u>
BTU	7838	9931
% Sulphur	0.29	0.37

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING

Division of Peabody International Corporation (Canada) Ltd.

S. Morrin
S. Morrin
Regional Manager



Charter Member

BILLINGS, MT • BIRMINGHAM, AL • CHARLESTON, WV • CLARKSBURG, WV • CLEVELAND, OH • CONNEAUT, OH • DENVER, CO • GOLDEN, CO • HELPER, UT • HENDERSON, KY • HOUSTON, TX • JASPER, AL
MIDDLESBORO, KY • MOBILE, AL • NEW BETHLEHEM, PA • NEW ORLEANS, LA • NORFOLK, VA • PALISADE, CO • PIKEVILLE, KY • SALINA, UT • SO. HOLLAND, IL • TOLEDO, OH • VANCOUVER, B.C. CAN.

PRINTED IN U.S.A.

COMMERCIAL TESTING & ENGINEERING

DIVISION OF PEABODY INTERNATIONAL CORPORATION (CANADA) LTD.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 • AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

August 14, 1980

G. A. NOEL & ASSOCIATES INC.
622-510 W. Hastings Street
VANCOUVER, BC
V6B 1L8

Sample identification
by
Commercial Test. & Engr. Co.

Kind of sample reported to us Coal - #336
Sample taken at ----
Sample taken by ----
Date sampled ----
Date received August 5/80

Analysis report no. 64-19617

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	15.09	XXXXX
% Ash	12.56	14.79
% Volatile	23.38	27.54
% Fixed Carbon	48.97	57.67
	<u>100.00</u>	<u>100.00</u>
BTU	9501	11189
% Sulphur	0.24	0.28

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING

Division of Peabody International Corporation (Canada) Ltd.

S. Morrin
S. Morrin
Regional Manager



Charter Member

BILLINGS, MT • BIRMINGHAM, AL • CHARLESTON, WV • CLARKSBURG, WV • CLEVELAND, OH • CONNEAUT, OH • DENVER, CO • GOLDEN, CO • HELPER, UT • HENDERSON, KY • HOUSTON, TX • JASPER, AL
MIDDLESBORO, KY • MOBILE, AL • NEW BETHLEHEM, PA • NEW ORLEANS, LA • NORFOLK, VA • PALISADE, CO • PIKEVILLE, KY • SALINA, UT • SO. HOLLAND, IL • TOLEDO, OH • VANCOUVER, B.C. CAN.

PRINTED IN U.S.A.

COMMERCIAL TESTING & ENGINEERING

DIVISION OF PEABODY INTERNATIONAL CORPORATION (CANADA) LTD.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

G. A. NOEL & ASSOCIATES INC.
622-510 W. Hastings Street
VANCOUVER, BC
V6B 1L8

August 14, 1980

Sample identification
by

Commercial Test. & Engr. Co.

Kind of sample reported to us Coal - #337
Sample taken at ----
Sample taken by ----
Date sampled ----
Date received August 5/80

Analysis report no. 64-19618

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	12.32	xxxxxx
% Ash	19.53	22.27
% Volatile	18.91	21.57
% Fixed Carbon	49.24	56.16
	<u>100.00</u>	<u>100.00</u>
BTU	8853	10097
% Sulphur	0.25	0.28

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING

Division of Peabody International Corporation (Canada) Ltd.

S. Morrin
S. Morrin
Regional Manager



Charter Member

BILLINGS, MT • BIRMINGHAM, AL • CHARLESTON, WV • CLARKSBURG, WV • CLEVELAND, OH • CONNEAUT, OH • DENVER, CO • GOLDEN, CO • HELPER, UT • HENDERSON, KY • HOUSTON, TX • JASPER, AL
MIDDLESBORO, KY • MOBILE, AL • NEW BETHLEHEM, PA • NEW ORLEANS, LA • NORFOLK, VA • PALISADE, CO • PIKEVILLE, KY • SALINA, UT • SO. HOLLAND, IL • TOLEDO, OH • VANCOUVER, B.C. CAN.

PRINTED IN U.S.A.

COMMERCIAL TESTING & ENGINEERING

DIVISION OF PEABODY INTERNATIONAL CORPORATION (CANADA) LTD.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

August 14, 1980

G. A. NOEL & ASSOCIATES INC.
622-510 W. Hastings Street
VANCOUVER, BC
V6B 1L8

Sample identification
by
Commercial Test. & Engr. Co.

Kind of sample reported to us Coal - #338
Sample taken at ----
Sample taken by ----
Date sampled ----
Date received August 5/80

Analysis report no. 64-19619

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	15.41	xxxxxx
% Ash	6.56	7.76
% Volatile	24.18	28.59
% Fixed Carbon	53.85	63.65
	<u>100.00</u>	<u>100.00</u>
BTU	9742	11517
% Sulphur	0.58	0.69

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING

Division of Peabody International Corporation (Canada) Ltd.

S. Morrin
S. Morrin
Regional Manager



Charter Member

COMMERCIAL TESTING & ENGINEERING

DIVISION OF PEABODY INTERNATIONAL CORPORATION (CANADA) LTD.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 - AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

August 14, 1980

G. A. NOEL & ASSOCIATES INC.
622-510 W. Hastings Street
VANCOUVER, BC
V6B 1L8

Sample identification
by
Commercial Test. & Engr. Co.

Kind of sample reported to us Coal - #339
Sample taken at -----
Sample taken by -----
Date sampled -----
Date received August 5/80

Analysis report no. 64-19620

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	20.60	xxxxxx
% Ash	7.87	9.91
% Volatile	30.29	38.15
% Fixed Carbon	41.24	51.94
	<u>100.00</u>	<u>100.00</u>
BTU	8274	10421
% Sulphur	0.49	0.62

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING

Division of Peabody International Corporation (Canada) Ltd.

S. Morrin
S. Morrin
Regional Manager



Charter Member

Copy Watermarked
Your Protection

BILLINGS, MT • BIRMINGHAM, AL • CHARLESTON, WV • CLARKSBURG, WV • CLEVELAND, OH • CONNEAUT, OH • DENVER, CO • GOLDEN, CO • HELPER, UT • HENDERSON, KY • HOUSTON, TX • JASPER, AL
MIDDLESBORO, KY • MOBILE, AL • NEW BETHLEHEM, PA • NEW ORLEANS, LA • NORFOLK, VA • PALISADE, CO • PIKEVILLE, KY • SALINA, UT • SO. HOLLAND, IL • TOLEDO, OH • VANCOUVER, B.C. CAN.

PRINTED IN U.S.A.

COMMERCIAL TESTING & ENGINEERING

DIVISION OF PEABODY INTERNATIONAL CORPORATION (CANADA) LTD.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

G. A. NOEL & ASSOCIATES INC.
622-510 W. Hastings Street
VANCOUVER, BC
V6B 1L8

August 14, 1980

Sample Identification
by

Commercial Test. & Engr. Co.

Kind of sample reported to us Coal - #340
Sample taken at -----
Sample taken by -----
Date sampled -----
Date received August 5/80

Analysis report no. 64-19621

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	22.73	xxxxx
% Ash	9.57	12.38
% Volatile	24.63	31.87
% Fixed Carbon	43.07	55.75
	<u>100.00</u>	<u>100.00</u>
BTU	8051	10419
% Sulphur	0.43	0.56

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING

Division of Peabody International Corporation (Canada) Ltd.

S. Morrin
S. Morrin
Regional Manager



Charter Member

BILLINGS, MT • BIRMINGHAM, AL • CHARLESTON, WV • CLARKSBURG, WV • CLEVELAND, OH • CONNEAUT, OH • DENVER, CO • GOLDEN, CO • HELPER, UT • HENDERSON, KY • HOUSTON, TX • JASPER, AL
MIDDLESBORO, KY • MOBILE, AL • NEW BETHLEHEM, PA • NEW ORLEANS, LA • NORFOLK, VA • PALISADE, CO • PIKEVILLE, KY • SALINA, UT • SO. HOLLAND, IL • TOLEDO, OH • VANCOUVER, B.C. CAN.

PRINTED IN U.S.A.

Copy Watermarked
Your Protection

COMMERCIAL TESTING & ENGINEERING

DIVISION OF PEABODY INTERNATIONAL CORPORATION (CANADA) LTD.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

G. A. NOEL & ASSOCIATES INC.
622-510 W. Hastings Street
VANCOUVER, BC
V6B 1L8

August 14, 1980

Sample identification
by

Commercial Test. & Engr. Co.

Kind of sample reported to us Coal - #341
Sample taken at ----
Sample taken by ----
Date sampled ----
Date received August 5/80

Analysis report no. 64-19622

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	15.65	XXXXXX
% Ash	52.47	62.21
% Volatile	13.97	16.56
% Fixed Carbon	17.91	21.23
	<u>100.00</u>	<u>100.00</u>
BTU	2875	3409
% Sulphur	0.29	0.34

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING

Division of Peabody International Corporation (Canada) Ltd.

S. Morrin
S. Morrin
Regional Manager



Charter Member

COMMERCIAL TESTING & ENGINEERING

DIVISION OF PEABODY INTERNATIONAL CORPORATION (CANADA) LTD.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

August 14, 1980

G. A. NOEL & ASSOCIATES INC.
622-510 W. Hastings Street
VANCOUVER, BC
V6B 1L8

Sample identification
by
Commercial Test. & Engr. Co.

Kind of sample reported to us Coal - #342
Sample taken at -----
Sample taken by -----
Date sampled -----
Date received August 5/80

Analysis report no. 64-19623

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	6.18	XXXX
% Ash	14.90	15.88
% Volatile	15.23	16.23
% Fixed Carbon	63.69	67.89
	<u>100.00</u>	<u>100.00</u>
BTU	11972	12761
% Sulphur	0.75	0.80

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING

Division of Peabody International Corporation (Canada) Ltd.

S. Morrin
S. Morrin
Regional Manager



Charter Member

BILLINGS, MT · BIRMINGHAM, AL · CHARLESTON, WV · CLARKSBURG, WV · CLEVELAND, OH · CONNEAUT, OH · DENVER, CO · GOLDEN, CO · HELPER, UT · HENDERSON, KY · HOUSTON, TX · JASPER, AL
MIDDLESBORO, KY · MOBILE, AL · NEW BETHLEHEM, PA · NEW ORLEANS, LA · NORFOLK, VA · PALISADE, CO · PIKEVILLE, KY · SALINA, UT · SO. HOLLAND, IL · TOLEDO, OH · VANCOUVER, B.C. CAN.

PRINTED IN U.S.A.

Original Copy Watermarked
or Your Protection

COMMERCIAL TESTING & ENGINEERING

DIVISION OF PEABODY INTERNATIONAL CORPORATION (CANADA) LTD.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

G. A. NOEL & ASSOCIATES INC.
622-510 W. Hastings Street
VANCOUVER, BC
V6B 1L8

August 14, 1980

Sample identification
by

Commercial Test. & Engr. Co.

Kind of sample reported to us Coal - #343
Sample taken at ----
Sample taken by ----
Date sampled ----
Date received August 5/80

Analysis report no. 64-19624

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	16.62	xxxxx
% Ash	8.50	10.19
% Volatile	17.07	20.47
% Fixed Carbon	57.81	69.34
	<u>100.00</u>	<u>100.00</u>
BTU	10672	12799
% Sulphur	0.53	0.63

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING

Division of Peabody International Corporation (Canada) Ltd.

S. Morrin
S. Morrin
Regional Manager



Charter Member

BILLINGS, MT • BIRMINGHAM, AL • CHARLESTON, WV • CLARKSBURG, WV • CLEVELAND, OH • CONNEAUT, OH • DENVER, CO • GOLDEN, CO • HELPER, UT • HENDERSON, KY • HOUSTON, TX • JASPER, AL
MIDDLESBORO, KY • MOBILE, AL • NEW BETHLEHEM, PA • NEW ORLEANS, LA • NORFOLK, VA • PALISADE, CO • PIKEVILLE, KY • SALINA, UT • SO. HOLLAND, IL • TOLEDO, OH • VANCOUVER, B.C. CAN.

PRINTED IN U.S.A.

Original Copy Watermarked
for Your Protection

COMMERCIAL TESTING & ENGINEERING

DIVISION OF PEABODY INTERNATIONAL CORPORATION (CANADA) LTD.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

G. A. NOEL & ASSOCIATES INC.
622-510 W. Hastings Street
VANCOUVER, BC
V6B 1L8

August 14, 1980

Sample identification
by

Commercial Test. & Engr. Co.

Kind of sample reported to us Coal - #344
Sample taken at -----
Sample taken by -----
Date sampled -----
Date received August 5/80

Analysis report no. 64-19625

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	34.53	xxxxxx
% Ash	8.21	12.54
% Volatile	20.24	30.91
% Fixed Carbon	37.02	56.55
	<u>100.00</u>	<u>100.00</u>
BTU	6730	10280
% Sulphur	0.22	0.33

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING

Division of Peabody International Corporation (Canada) Ltd.

S. Morrin
S. Morrin
Regional Manager



Charter Member

COMMERCIAL TESTING & ENGINEERING

DIVISION OF PEABODY INTERNATIONAL CORPORATION (CANADA) LTD.
GENERAL OFFICES: 228 NORTH LA SALLE STREET, CHICAGO, ILLINOIS 60601 · AREA CODE 312 726-8434



PLEASE ADDRESS ALL CORRESPONDENCE TO:
147 RIVERSIDE DRIVE, NORTH VANCOUVER, B.C.
V7H 1T6, CANADA
OFFICE TEL. (604) 929-2228

G. A. NOEL & ASSOCIATES INC.
622-510 W. Hastings Street
VANCOUVER, BC
V6B 1L8

August 14, 1980

Sample identification
by

Commercial Test. & Engr. Co.

Kind of sample reported to us Coal - #345
Sample taken at ----
Sample taken by ----
Date sampled ----
Date received August 5/80

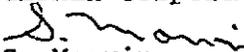
Analysis report no. 64-19626

PROXIMATE ANALYSIS

	<u>As Rec'd.</u>	<u>Dry Basis</u>
% Moisture	24.72	xxxxxx
% Ash	7.94	10.55
% Volatile	23.72	31.51
% Fixed Carbon	43.62	57.94
	<u>100.00</u>	<u>100.00</u>
BTU	8064	10712
% Sulphur	0.37	0.49

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING

Division of Peabody International Corporation (Canada) Ltd.

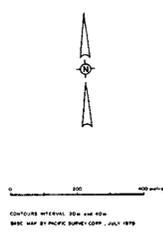
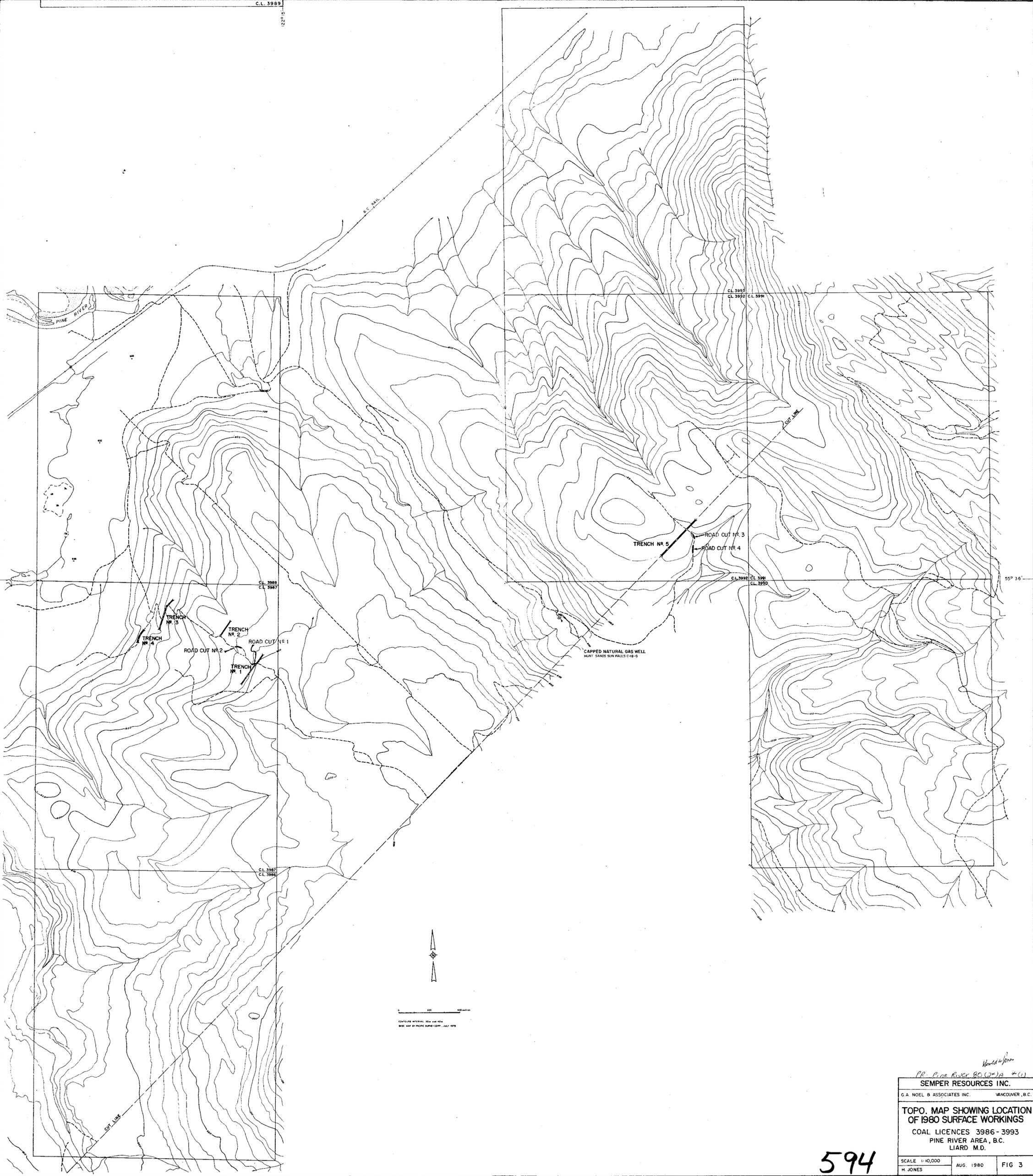

S. Morrin
Regional Manager



Charter Member

C.L. 3989

122° 15'



Handwritten: PR - Pine River 80 (27)A # (1)

SEMPER RESOURCES INC.

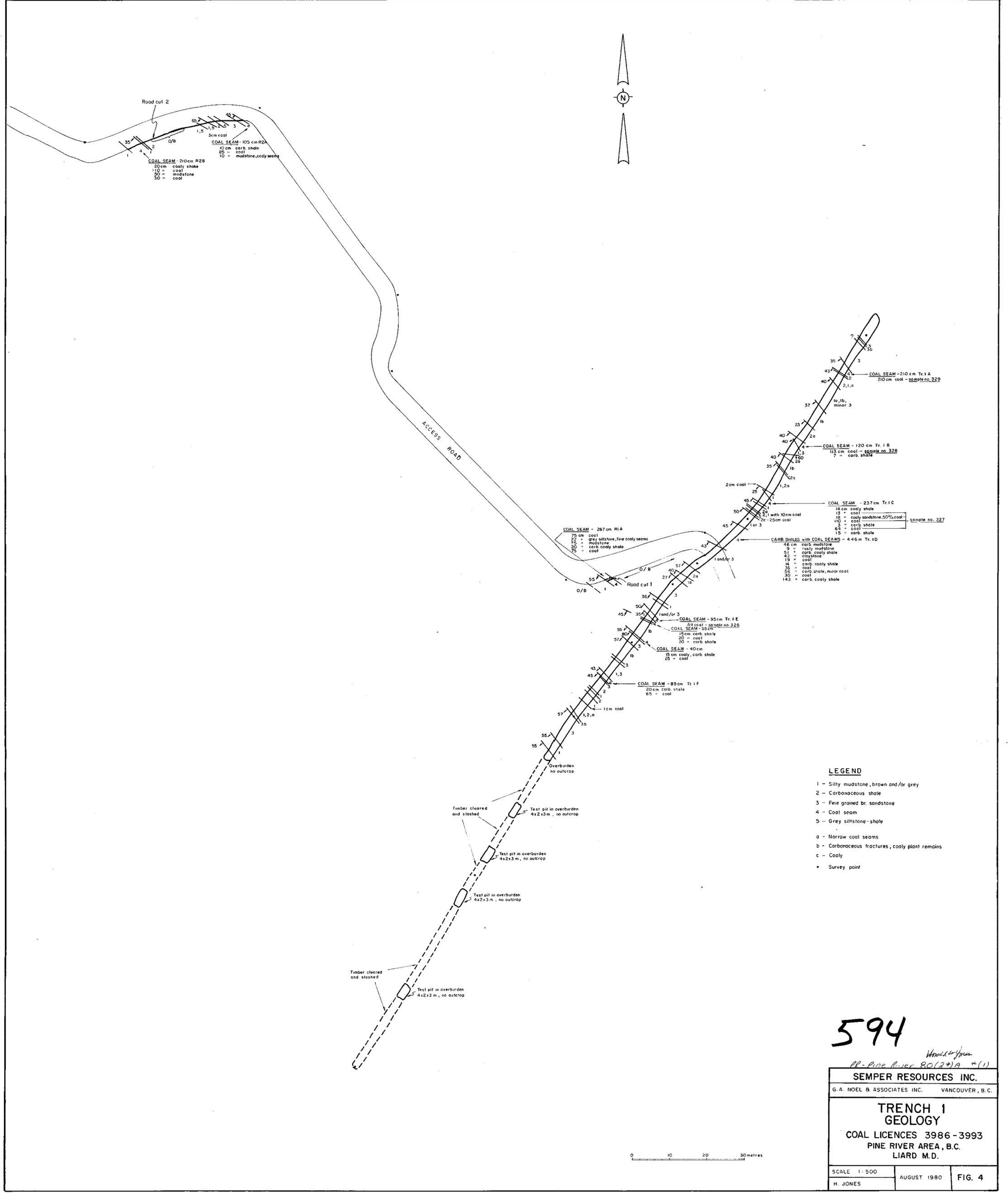
G. A. NOEL & ASSOCIATES INC. VANCOUVER, B.C.

TOPO. MAP SHOWING LOCATION OF 1980 SURFACE WORKINGS

COAL LICENCES 3986 - 3993
PINE RIVER AREA, B.C.
LIARD M.D.

SCALE 1:40,000	AUG. 1980	FIG 3
H. JONES		

594



Road cut 2

COAL SEAM - 210cm R2B
 20cm coaly shale
 110 " coal
 50 " mudstone
 50 " coal

COAL SEAM - 105cm R2A
 10cm carb. shale
 85 " coal
 10 " mudstone, coaly seams

COAL SEAM - 210cm Tr. 1 A
 210cm coal - sample no. 329

COAL SEAM - 120cm Tr. 1 B
 115cm coal - sample no. 328
 7 " carb. shale

COAL SEAM - 237cm Tr. 1 C
 14cm coaly shale
 13 " coal
 18 " coaly sandstone, 50% coal
 110 " coal
 3 " carb. shale
 6 " coal
 15 " carb. shale

CARB. SHALES with COAL SEAMS - 446cm Tr. 1 D
 46cm carb. mudstone
 9 " rusty mudstone
 41 " carb. coaly shale
 42 " claystone
 19 " coal
 14 " carb. coaly shale
 36 " coal
 56 " carb. shale, minor coal
 30 " coal
 143 " carb. coaly shale

COAL SEAM - 267cm R1A
 75cm coal
 22 " grey siltstone, fine coaly seams
 75 " mudstone
 20 " carb. coaly shale
 72 " coal

COAL SEAM - 95cm Tr. 1 E
 All coal - sample no. 326

COAL SEAM - 55cm
 15cm carb. shale
 20 " coal
 20 " carb. shale

COAL SEAM - 40cm
 15cm coaly, carb. shale
 25 " coal

COAL SEAM - 85cm Tr. 1 F
 20cm carb. shale
 65 " coal

- LEGEND**
- 1 - Silty mudstone, brown and/or grey
 - 2 - Carbonaceous shale
 - 3 - Fine grained br. sandstone
 - 4 - Coal seam
 - 5 - Grey siltstone - shale
 - a - Narrow coal seams
 - b - Carbonaceous fractures, coaly plant remains
 - c - Coaly
 - Survey point

Timber cleared and slashed

Test pit in overburden 4x2x3 m, no outcrop

Overburden no outcrop

Test pit in overburden 4x2x3 m, no outcrop

Test pit in overburden 4x2x3 m, no outcrop

Test pit in overburden 4x2x3 m, no outcrop

Timber cleared and slashed

Test pit in overburden 4x2x3 m, no outcrop

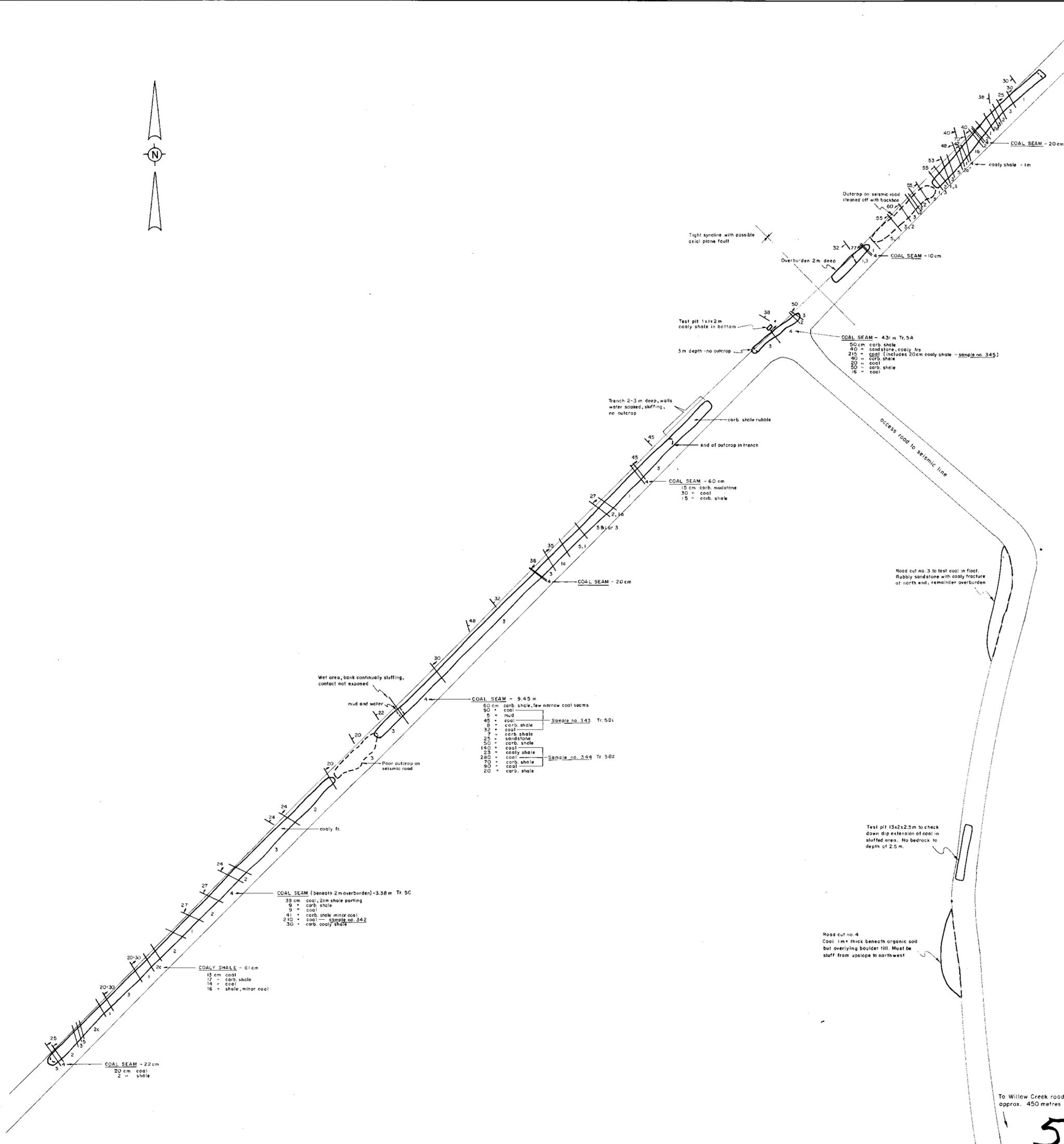
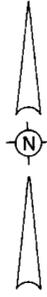
594

Handwritten signature

*RR-Pine River 80(2*1)A *(1)*

SEMPER RESOURCES INC.	
G.A. NOEL & ASSOCIATES INC. VANCOUVER, B.C.	
TRENCH 1 GEOLOGY	
COAL LICENCES 3986-3993	
PINE RIVER AREA, B.C.	
LIARD M.D.	
SCALE 1:500	AUGUST 1980
H. JONES	FIG. 4





Bulldozed seismic line

COAL SEAM - 20 cm

coaly shale - 1m

Outcrop on seismic road cleaned off with backhoe

COAL SEAM - 10 cm

Tight syncline with possible axial plane fault

Overburden 2m deep

Test pit 1x1x2 m coaly shale in bottom

3m depth - no outcrop

COAL SEAM - 43 m Tr. 5A

50 cm carb. shale
40 " sandstone, coaly frs
215 " coal (includes 50cm coaly shale - sample no. 345)
40 " carb. shale
50 " coal
50 " carb. shale
16 " coal

Trench 2-3 m deep, walls water soaked, shuffling, no outcrop

carb. shale rubble

end of outcrop in trench

COAL SEAM - 60 cm
15 cm carb. mudstone
30 " coal
15 " carb. shale

access road to seismic line

Road cut no. 3 to test coal in float. Rubbly sandstone with coaly fracture at north end, remainder overburden

Wet area, bank continually stuffing, contact not exposed

COAL SEAM - 9.45 m

60 cm carb. shale, few narrow coal seams
90 " coal
5 " mud
45 " coal
8 " carb. shale
32 " coal
7 " carb. shale
25 " sandstone
50 " carb. shale
140 " coal
23 " coaly shale
280 " coal
70 " carb. shale
90 " coal
20 " carb. shale

Sample no. 343 Tr. 5D1

Sample no. 349 Tr. 5B2

Poor outcrop on seismic road

COAL SEAM (beneath 2m overburden) - 3.58 m Tr. 5C

39 cm coal, 2cm shale parting
9 " carb. shale
9 " coal
41 " carb. shale minor coal
210 " coal - Sample no. 342
30 " carb. coaly shale

COALY SHALE - 61 cm
13 cm coal
17 " carb. shale
14 " coal
16 " shale, minor coal

COAL SEAM - 22 cm
20 cm coal
2 " shale

Test pit 13x2x2.5m to check down dip extension of coal in stuffed area. No bedrock to depth of 2.5 m.

Road cut no. 4
Coal 1 m thick beneath organic soil but overlying boulder hill. Must be stuff from upslope to northwest

To Willow Creek road approx. 450 metres



For legend see Fig 4 RR Pine River 80(2)A (1)

SEMPER RESOURCES INC.
 G.A. NOEL & ASSOCIATES INC. VANCOUVER, B.C.

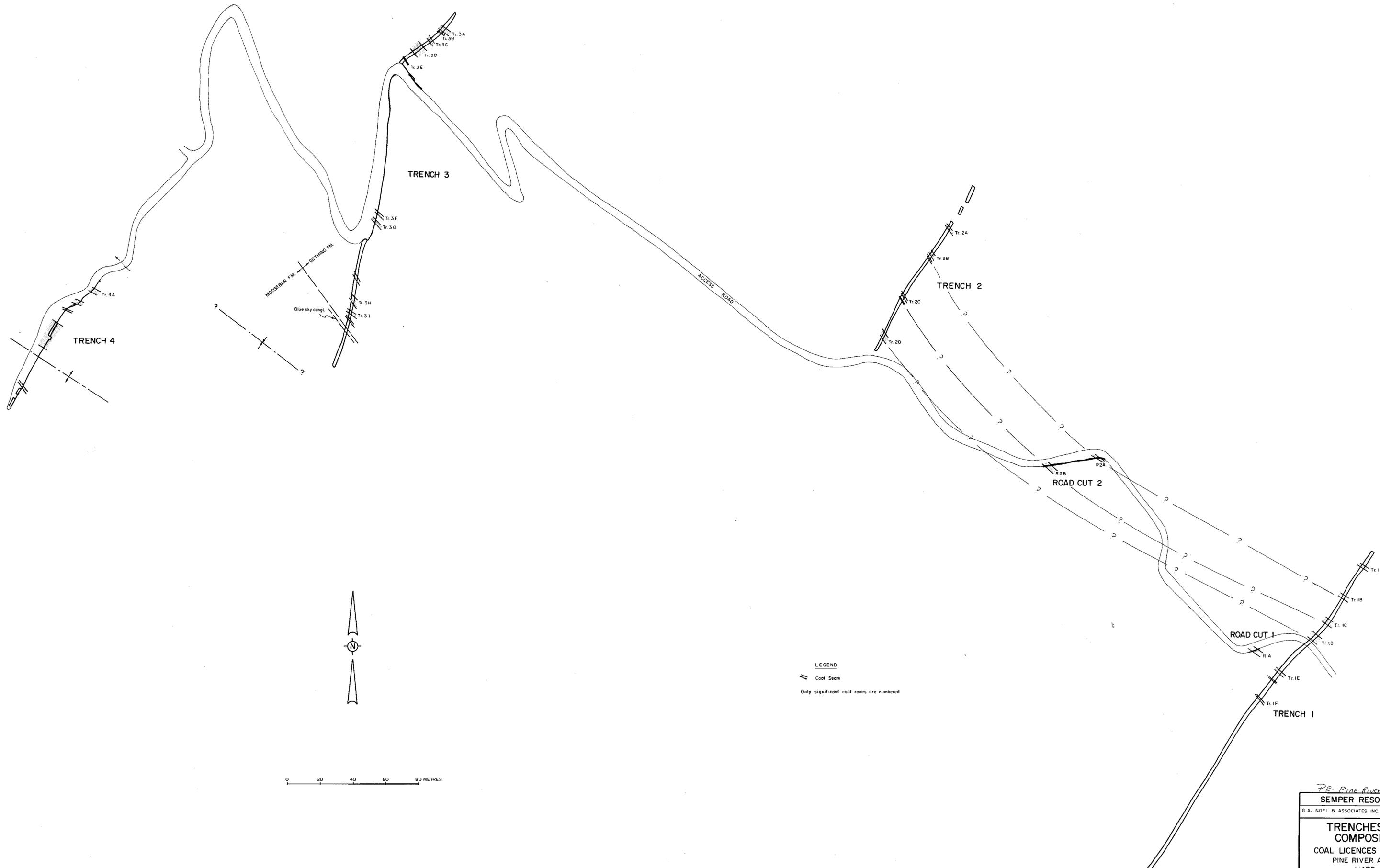
TRENCH 5 GEOLOGY
 COAL LICENCES 3986 - 3993
 PINE RIVER AREA, B.C.
 LIARD M.D.

SCALE 1:500
 H. JONES

AUGUST 1980

FIG. 8

594



LEGEND
 // Coal Seam
 Only significant coal zones are numbered

0 20 40 60 80 METRES

594

Handed in from
 PR- Pine River 800710 40

SEMPER RESOURCES INC.		
G. A. NOEL & ASSOCIATES INC. VANCOUVER, B.C.		
TRENCHES 1 - 4		
COMPOSITE MAP		
COAL LICENCES 3986 - 3993		
PINE RIVER AREA, B.C.		
LIARD M.D.		
SCALE 1:1000	AUGUST 1980	FIG. 9
H. JONES		