PR - WILLOW CREEK 81/12A

DIAMOND DRILLING AND TRENCHING REPORT
ON COAL LICENSES 3986 TO 3993 INCLUSIVE, 6792, 7191 AND 7192
~~PINE RIVER AREA~~ WILLOW CREEK
LIARD MINING DIVISION
NTS 93 O/9

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

Owner of Licenses: J.N. MacLeod, P.Eng.

Operator: David Minerals Ltd.

Consultant: G.A. Noel & Associates, Inc.

Author: A.S. Marton, B.Sc.,
Project Geologist

OPEN FILE

Date: December 15, 1981

GEOLOGICAL BRANCH
ASSESSMENT REPORT

00 690

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

DIAMOND DRILLING AND TRENCHING REPORT ON COAL LICENSES 3986 TO 3993 INCLUSIVE, 6792, 7191 AND 7192 PINE RIVER AREA LIARD MINING DIVISION NTS 93 O/9

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

Owner of Licenses: J.W. MacLeod, P.Eng.

Operator: David Minerals Ltd.

Consultant: G.A. Noel & Associates, Inc.

Author: A.S. Marton, B.Sc.,
Project Geologist

Date: December 15, 1981

G. A. NOEL & ASSOCIATES INC.
CONSULTING GEOLOGISTS

TABLE OF CONTENTS

FIGURES

Figures

TABLES

SUMMARY

From July 1, 1981 to November 15, 1981 G.A. Noel & Associates Inc., on behalf of David Minerals Ltd., conducted further exploration on the Willow Creek coal licences located 50km SW of Chetwynd, B.C.

Work consisted of diamond drilling, backhoe trenching and mapping conducted to evaluate 8 coal zones. The exploration was concentrated on coal licences 3990, 3991, 3992 and 3993 to define the limits of coal seams 1 to 8 and determine coal quality.

Thirty-four HQ drill holes totalling 9085 metres (29,806ft.) were completed during the 13 week period July 23 to November 3, 1981. Total diamond drilling on the property, Phase I and Phase II, is forty-six drill holes totalling 12,093 metres (39,675ft.).

Results from more than three hundred samples indicate the coal to be mainly of low to moderate volatile bituminous quality with a low ash content. It averages 14,000 BTU's per lb. and 0.6% sulphur.

Calculations from 46 diamond drill hole intercepts and more than 40 trenches indicate a total of 72,562,425 tonnes of coal resources, of which 46,613,190 tonnes are classified as measured resources; 12,927,759 tonnes as indicated resources; and 13,021,476 tonnes as inferred resources.

It was concluded that the property warrants an underground bulk sampling program. To facilitate this work, additional diamond drilling is required in the vicinity of the proposed adit sites to better define the local geology and coal seams. It was also concluded that drilling is warranted

at the south end of the property to explore the coal seams to the property boundary.

It was recommended that a two-stage program costing $2,562,600 be conducted to complete the above mentioned drilling and underground bulk sampling.

INTRODUCTION

David Minerals Ltd. hold eleven contiguous coal licences in the Willow Creek area of the Pine River Valley 49 km west of Chetwynd, B.C. (Fig.1, 2).

G.A. Noel & Associates, Inc., on behalf of the company, conducted geological mapping and backhoe trenching programs on the licenses during the months of July and August of both 1979 and 1980. The above work was successful in locating several significant coal seams on licence 3992.

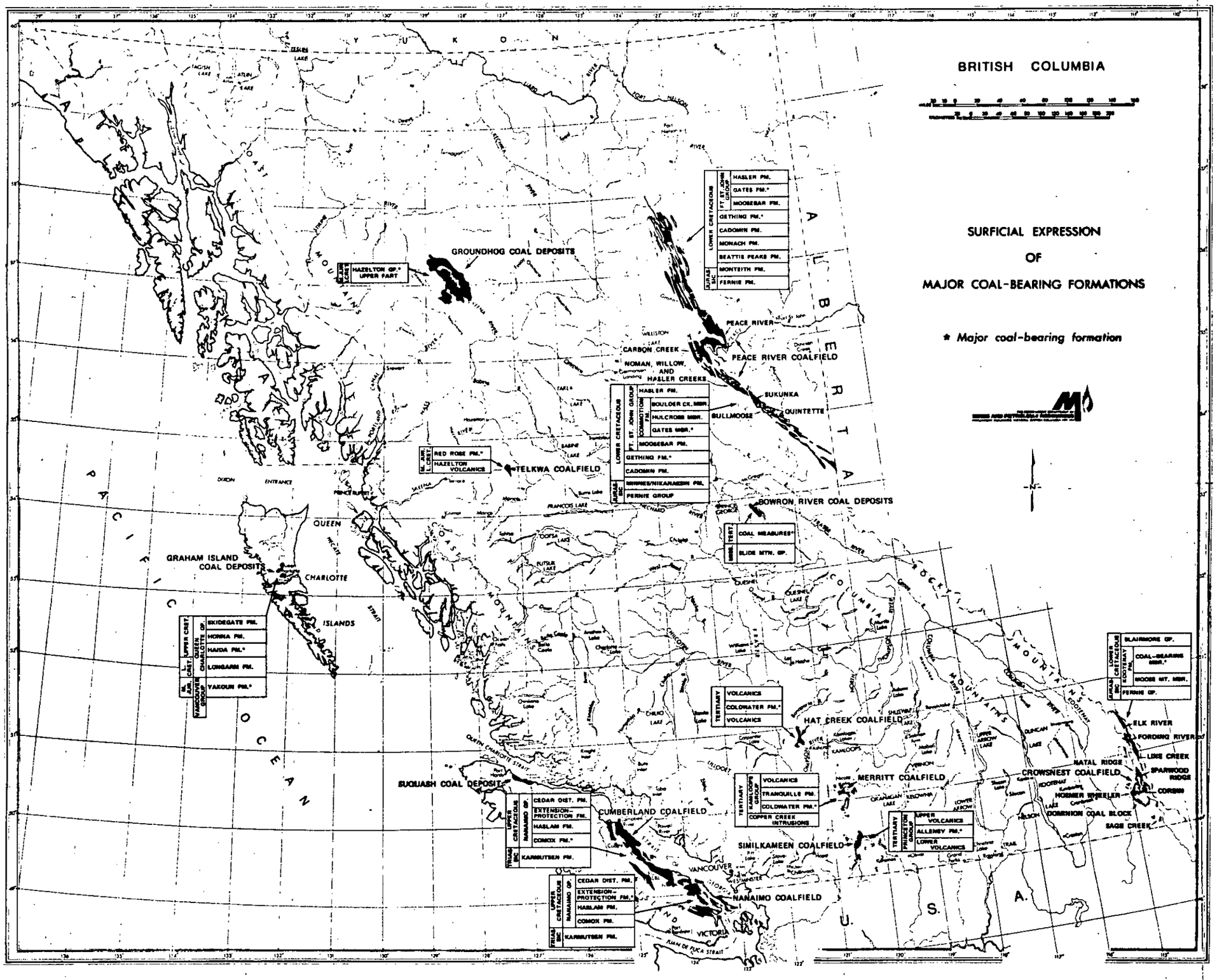
When Semper Resources Inc. financing was finalized in late 1980, a Phase I program consisting of backhoe trenching followed by diamond drilling was undertaken. This work was carried out between October 1, 1980 and March 8, 1981 and is documented in the report by A.S. Marton, B.Sc. and H.M. Jones, P.Eng.(1981).

Following the successful delineation of 8 coal zones in the Phase I exploration program, a Phase II program of more detailed diamond drilling and backhoe trenching was approved during the latter part of June, 1980.

This program commenced in July and field work was completed by November 1981.

During this program Semper Resources Inc. was amalgamated with David Minerals Ltd. and now operate under the latter name.

A permanent 64 m bridge was constructed over the Pine River to give ready access to the licences from highway 97. Pickell Construction Ltd. of Fort St.John under the direct supervision of T.M. Thomson & Associates Ltd., consulting engineers, and management by the author; completed the task between the latter part of August and the middle of October.



DAVID MINERALS LIMITED

WILLOW CREEK PROJECT

COAL LICENCES 3986-3993, 6792, 7191 & 7192

SURFICIAL EXPRESSION OF MAJOR COAL-BEARING FMS.

SCALE : AS SHOWN	NTS BRITISH COLUMBIA	DWG. NO.	
DATE / REVISIONS APRIL 1981 / DEC. 1981		DWG. BY	WORK BY G.A.NOEL & ASSOCIA.

Figure 1

APPENDIX I

APPENDIX I

STATEMENT OF COSTS
Assessment Year August 7/81 to November 1/82

A. ON-PROPERTY COSTS:

Geological Mapping:

Reconnaissance	N/A	
Detail	N/A	
Surface	N/A	
Underground	N/A	
Other (specify)	- Geological Core logging & Supervision	$40,457.70

Geophysical/Geochemical Surveys;

Method		
Grid		
Topographic	- Area flown, map made from photos	
Other (specify)	- ground survey for airphoto control, also baseline laid out, All holes & roads also surveyed	55,589.04

Road Construction:

On licenses Nos.	- 3990-3993, 6792, 7192	220,579.49
Access to	- camp & all drill sites	

Surface Work:

Trenching	- 35 trenches totalling 762 m, average width & depth 1.5 m	5,400.00
Seam tracing	N/A	
Crosscutting	N/A	
Other (specify)	N/A	

Underground Work:

Test adits	N/A	
Other workings	N/A	

Drilling:

Core		
Diamond	N/A	
Wireline	- 17 HQ holes totalling 7493.8 m	838,362.45
Rotary		
Conventional	N/A	
Reverse circulation	N/A	
Other	N/A	

Contractor - Olympic Drilling
Where core stored - Charlie Lake

Appendix I
Statement of Costs
A. On-Property Costs:
Page two

Logging:

Gamma-Neutron, density, caliper, directional, by Roke Oil Enterprises	$102,726.74

Sampling:

Trenches, drill core, cost included in "Testing" below.

Testing:

Above samples for proximate analysis, FSI by commercial Testing & Engineering; Loring Laboratory	22,516.60
Other work N/A	
Reclamation work -seeding	741.74

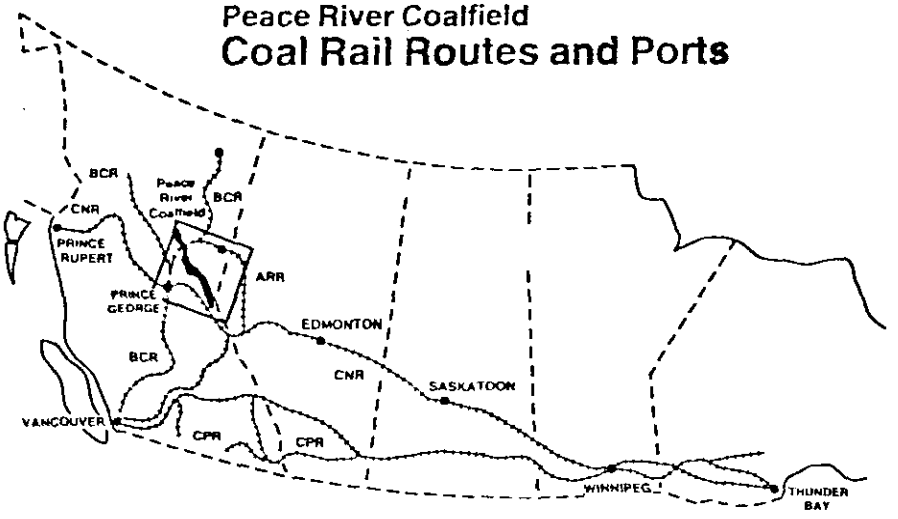
On-Property Costs	total	$1,286,373.76

B. OFF-PROPERTY COSTS:

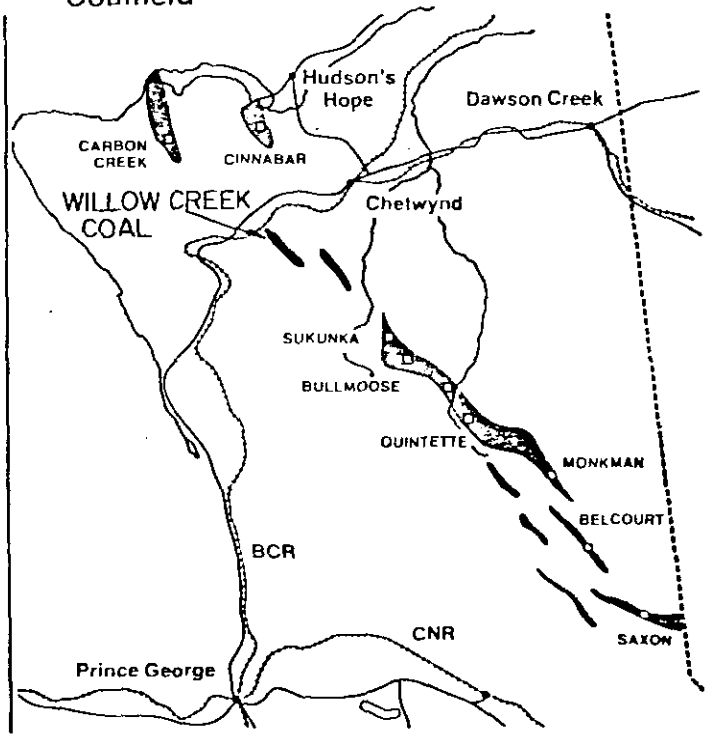
Travel	$3,659.52		
Motel	1,470.19	5,129.71	
Freight - by truck		10,854.02	
Report & map preparation		27,420.00	
Off-Property Costs	total	-	$ 43,403.73

TOTAL ALL COSTS $1,329,777.49

Peace River Coalfield
Coal Rail Routes and Ports



Northeast Region
Peace River Coalfield



— Existing Roads
— Existing Railways
• Existing Communities
□ Proposed Mines

Peace River Coalfield
Coal Resources

Resource	Millions of Tonnes
Measured	300
Indicated	285
Inferred	7,720

Metallurgical - 85% Thermal - 15%

Figure 2

Property

The property consists of eleven coal licences (Figures 3, 5). They are:

Coal Licence	Hectares	Expiry Date
3986	292.64	August 8, 1981
3987	292.50	"
3988	292.40	"
3989	292.12	"
3990	292.50	"
3991	292.40	"
3992	292.40	"
3993	292.26	"
6792	292.40	December 5, 1981
7191	292.26	September 8, 1982
7192	292.76	"
	3216.64 Ha.	

Coal Licences 3986 - 3993 are owned by:

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

They are presently under option by:

David Minerals Ltd.
1010 - 475 Howe Street
Vancouver, B.C.

David Minerals Ltd. is the owner of licences 6792, 7191 and 7192.

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 1.5 km wide Pine

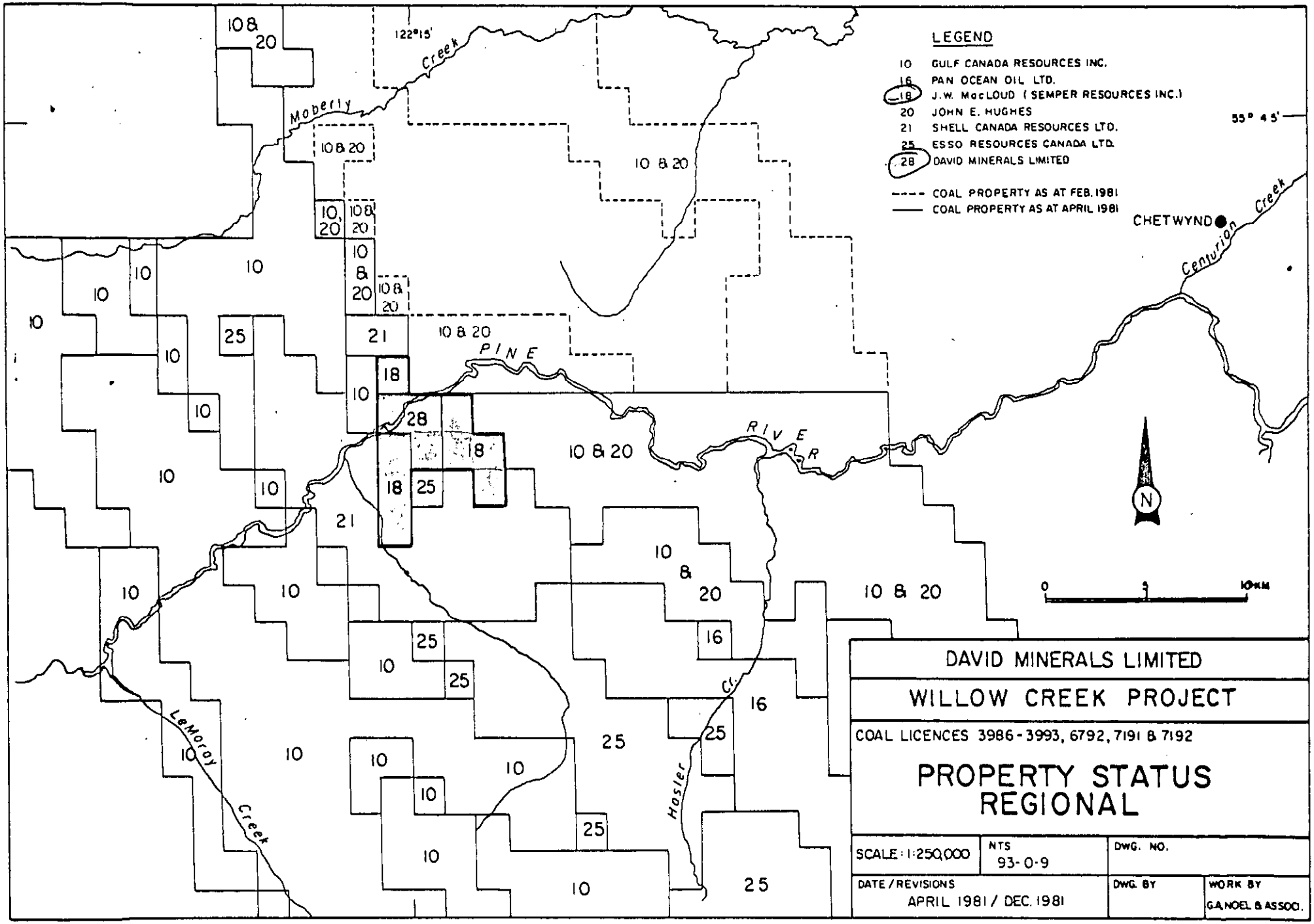

LEGEND
10 GULF CANADA RESOURCES INC.
16 PAN OCEAN OIL LTD.
18 J.W. MacLOUD (SEMPER RESOURCES INC.)
20 JOHN E. HUGHES
21 SHELL CANADA RESOURCES LTD.
25 ESSO RESOURCES CANADA LTD.
28 DAVID MINERALS LIMITED
COAL PROPERTY AS AT FEB. 1981
COAL PROPERTY AS AT APRIL 1981
122°15'
55° 45'
Moberly Creek
CHETWYND
Centurion Creek
PINE RIVER
LeMoray Creek
Hasler Cr.
N
0 5 10 KM
DAVID MINERALS LIMITED
WILLOW CREEK PROJECT
COAL LICENCES 3986-3993, 6792, 7191 & 7192
PROPERTY STATUS REGIONAL
SCALE: 1:250,000
NTS 93-O-9
DWG. NO.
DATE / REVISIONS APRIL 1981 / DEC. 1981
DWG. BY
WORK BY G.A. NOEL & ASSOC.

Figure 3

River Valley. In the licences area there is a change in elevation relative to the Pine Valley of only 670 metres (Figures 4a, b, c, 5).

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.

Location and Access

The property is located at the following approximate co-ordinates: 55°36'north latitude; 122°14'west longitude.

The coal licences are located in the Peace River district of northeast British Columbia (see Figure 1). They are situated adjacent to the Pine River, approximately 50 km west of Chetwynd and 190 km north-northwest of Prince George.

Access to the general area is via British Columbia highway 97, which is an all weather road connecting Prince George to Dawson Creek, and passes through the Pine Valley and Chetwynd. B.C. Rail also passes through the Pine Valley (see Figure 2) with the highway on the north side and the railway on the south side of the river. B.C. Rail crosses through parts of licences 3988, 3993, 7191 and 7192. The abandoned Falls railway siding is located on the northwest corner of licence 3988 (see Figure 3).

Dawson Creek and Fort St. John, approximately 100 km and

160 km respectively north of Chetwynd, are serviced with daily flights by commercial airlines. Rental vehicles are available at both airports.

With the construction of a permanent bridge, the major access problem of crossing the Pine River has been eliminated.

The West Coast Transmission pipeline right-of-way (with their permission) served as a temporary road bed that connected the southern bridge abutment to the exploration camp and working areas.

During the Phase II exploration program 13 km of additional diamond drill access roads were constructed (Fig. 6).

History

Coal in the Peace River district of northeastern British Columbia was known of 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 Forest 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 only using seams of 1.2 m or greater in thickness.

Coal licences 3986 to 3993, 6792, 7191 and 7192 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 structurally disturbed areas. No serious work was carried out after the government's program in the Pine River area until 1969 when Brameda 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 at that time.

Also, in 1969, Brameda Resources Ltd. commenced work on the Sukunka deposit located approximately 55 km southeast of the Pine River area. Early work in this district quickly indicated the potential of the Bullmoose Mountain area as a major coal field. Three deposits are now proven in this area and are scheduled for production by 1983. They are the Sukunka, Bullmoose and Quintette deposits (see Figure 2).

In 1979 Semper Resources Inc. acquired coal licences 3986-3993 and conducted reconnaissance geological mapping on parts of the licences. Areas of interest located during the above were tested by backhoe trenching during July and August, 1980. This work was reported by Jones (1979 & 1980).

The work referred to above was successful in exposing three significant coal seams on licence 3992. As a result of this encouragement Semper Resources Inc. resumed backhoe trenching in October 1980, then followed up with a diamond drill program. The object of the additional exploration was to further expose, along strike, the significant coal seams on licence 3992, explore for additional seams, and test the seams at depth by drilling. This Phase I diamond drilling and trenching work was reported by Marton and Jones, 1981.

JULY-NOVEMBER 1981 - PHASE II EXPLORATION

Mobilization

The backhoe and drilling equipment were moved to the property via highway transport to the river crossing, then forded across and moved to coal licence 3992.

The two diamond drill rigs were skidded to and between

drill sites using a D6C and D7G for the Longyear 38 and Longyear 44 respectively. The Longyear 38 was used for the shorter/shallower holes on the northern part of the property and was easier to maneuver around the tight switch-backs on the ridge road (Figure 6).

The Longyear 44 was used for the deeper holes on the eastern and southern part of the property. It was heavier, less maneuverable, but was moved less frequently.

Accomodation

On site accomodation for 24 men was established to maximize exploration time and reduce costs. Seven Atco supplied trailers with full facilities and a cooking staff provided by Crown Catering from Edmonton resulted in a comfortable and convenient camp.

The trailers were brought from Prince George and Fort St. John by Atco personnel. The trailers, mounted on wheels, were dragged across the Pine River by bulldozer and positioned onto a previously prepared location 1 km away.

The generator and incinerator was leased from Crown Camp Services. Power hook-up was completed by Niels Electric of Chetwynd. Water, sewer and propane hookups were contracted to Beck's Plumbing also of Chetwynd.

Trenches for water and sewer, a well and large septic sump were dug using a backhoe from Little Giant Excavating of Chetwynd.

Early September brought the threat of frost. This resulted in the winterizing (skirting) of trailers by ATCO Pacific from Prince George.

At the termination of the program the entire camp was dismantled, and the site restored.

Road Construction

Access to the property was well established from the Phase I program. 13 km of additional drill site access roads were constructed during the course of the thirty-four hole Phase II program. Road construction along the ridge to the north also exposed coal seams which were mapped and sampled. After the approximate surface trace of seams was determined from roadcut and drill hole projections, backhoe trenching confirmed seam locations where necessary and provided further samples (Figures 4a, b, c).

Control Surveying

All work completed to the end of the first phase of drilling was surveyed with a 'compass and chain' degree of accuracy. With the need for a higher level of accuracy, McElhanney Surveying and Engineering Ltd. from Vancouver was contracted to generate base maps from aerial photography and establish a local mine grid base line using a ground survey.

Instrument surveys were made by Semper Resources to tie Phase I and Phase II diamond drill holes into the local mine grid, establish collar elevations, as well as survey in roads constructed after the aerial photography was flown. At the termination of the program McElhanney was again asked to collar co-ordinates and elevations for the last drill holes.

This work provided David Minerals Ltd. with:

a) 1:5000 scale base map with 10m contours (see Figure 29)

b) 1:2500 scale base map with 5m contours (see Figures 4a,b,c)

c) An accurately surveyed baseline for a 5000m by 5000m grid (See Figure 6).

d) Accurately surveyed drill holes, collar elevations and roads from both the Phase I and Phase II programs (see Figures 4a,b,c).

e) UTM co-ordinates and latitude and longitude for all McElhanney survey points enabling generation of coal lease boundaries (see Figure 6).

Trenching

Trenching was carried out by a John Deere 450 crawler type combination front end loader-backhoe owned by Tor Tor Trucking of Chetwynd, B.C.

Trenches were laid out along drill access roads to locate and sample coal seams. (See Figures 4a,b,c). Location and coal quality are tabulated in Table 4. Thirty-five trenches and roadcuts were dug totalling 762 m in length.

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

When bedrock was lost due to deep burial several stepout test pits were dug to approximately 4m, the limit of the equipment.

Geological Mapping

Geology was mapped along road cuts, in stable trenches and interpolated from diamond drill hole projections.

It was mapped in notebook form then plotted on a map on a scale of 1:500 and 1:2000. The surface geology was later transferred to the McElhanney base maps 1:2500 and 1:5000 (Figures 4a,b,c, & 29). Coal seams were later transferred to a 1:2500 scale plan and cross sections (Figures 7-25).

Diamond Drilling

Thirty-four HQ diamond drill holes were completed by Olympic Drilling Co., using Longyear Super 38 and Longyear 44 drills (Table 3). They were moved from site to site with a D6C and D7G respectively.

Water was a major problem during the Phase II drilling program. The summer and fall of 1981 was unusually dry and all local water sources dried up. Hauling water became mandatory, using numerous local contractors including Juanita, and F. Ollenberger - Rolla, B.C.; Big Jim's - Dawson Creek.; and various other short term contractors.

In August, due to extreme fire hazard conditions, B.C.Forest Service imposed work restrictions on the project. For three weeks drilling was limited to two 8-hour shifts, one in the morning and one in the evening. This reduced production and morale and increased overhead costs.

Following the hot summer, the water table was never recharged to normal and water hauling was continued to the end of the program in mid-November. Drilling water was trucked initially from various local 'marginal' sources and finally 3-5 km from the Pine River.

All drill core was geologically logged on the appropriate forms and plotted as both stratigraphic columns and as drill hole sections (Figures 27 & 28).

Geophysical Surveys

Roke Oil Enterprises Limited of Calgary were contracted once again to conduct down hole geophysical surveys on each hole upon completion of drilling. Data recorded included Gamma-ray neutron, sidewall densilog, caliper and directional surveys.

Data from these surveys aided the writer in interpreting the coal content of the seams and interpreting between seams. The logs were also valuable in the interpretation of seams in which core losses have occurred.

Down hole directional surveys indicated a steepening of the majority of drill holes by one degree every thirty metres.

Bridge Construction

Initially, access to the working area was from highway 97 via a ford across the Pine River. Fluctuations in the river level often made this crossing impassible to 4x4 vehicles, so a small boat was used to ferry the crew over the river. When the river began to freeze and temperatures dropped to $-20^{\circ}C$ to $-40^{\circ}C$ neither fording nor boat travel were possible.

This problem was solved last winter by construction of a temporary wood bridge. It was removed upon termination of the Phase I program.

With the implementation of the larger Phase II program it was decided that a permanent access bridge was necessary. Pickell Construction of Fort St. John was contracted to erect

the 'EZ' type bridge under the direct supervision of T.M. Thomson & Associates Ltd. of Victoria, B.C. and managed by the author.

The period of construction was lengthened somewhat by delays in the shipping of lumber as a result of a B.C. Forest Industry strike.

After spring break-up in 1982, the bridge approaches will have to be upgraded. Also, the temporary road utilizing the West Coast Transmission pipeline right-of-way must be re-located. Approximately 5 km of road upgrading are required to provide reliable access to the licenses and the proposed portal sites (Figure 29)

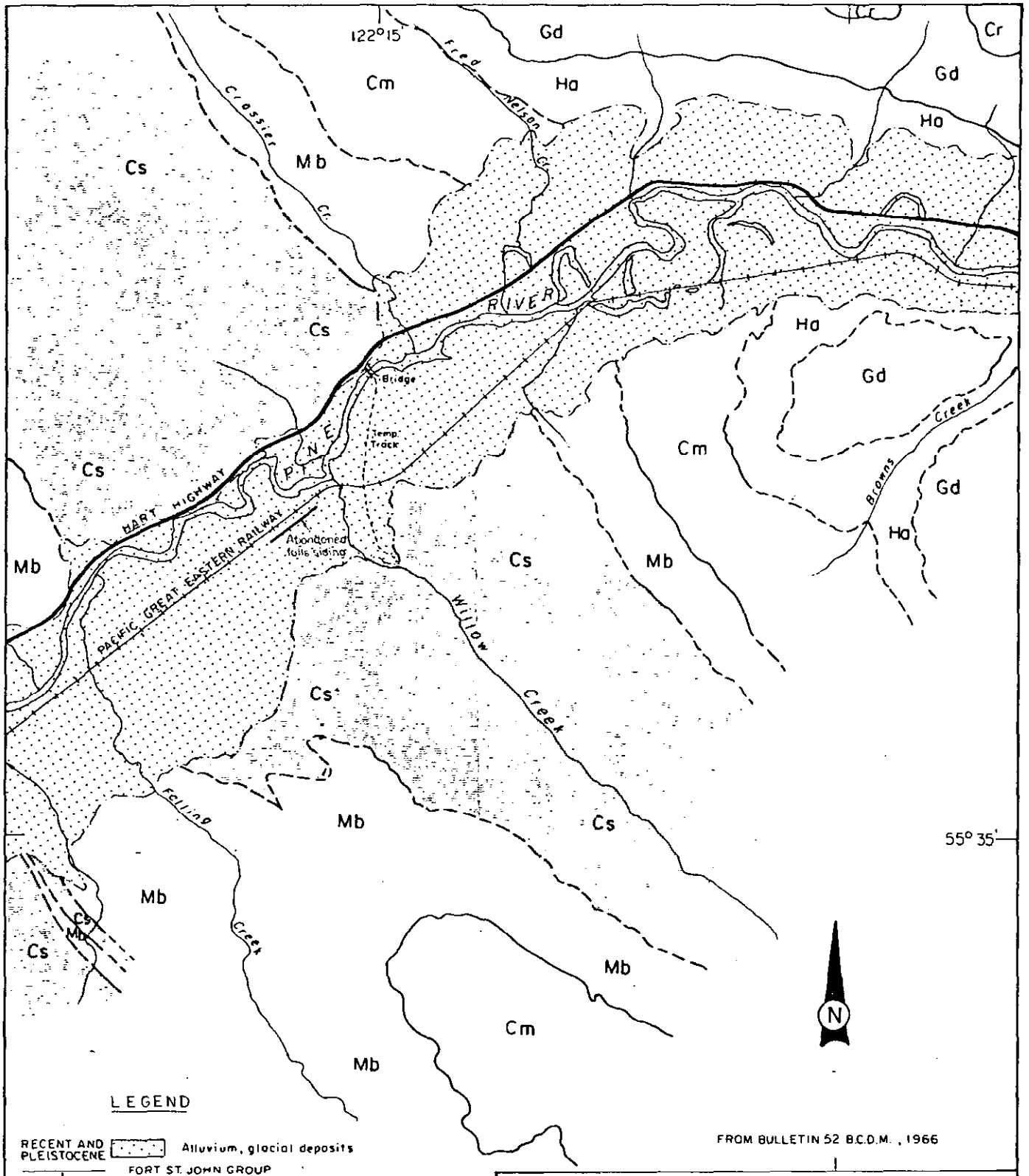
GEOLOGY

Regional Geology

The Rocky Mountains consist of a complex series of closely folded, faulted and thrusted 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 (Table 1 , Figure 26).

Bullhead and Fort St. John Formations outcrop in the Pine



FROM BULLETIN 52 B.C.D.M., 1966

DAVID MINERALS LIMITED

WILLOW CREEK PROJECT

COAL LICENCES 3986-3993, 6792, 7191 & 7192

REGIONAL GEOLOGY PINE VALLEY AREA

SCALE: 1:63,360	NTS 93-O-9	DWG. NO.	
DATE / REVISIONS APRIL 1981 / DEC. 1981		DWG. BY	WORK BY G. A. NOEL & ASSOCIA.

Figure 26

TABLE 1

TABLE OF FORMATIONS

Series	Group				
Upper Cretaceous	Fort St. John		Dunvegan (350-1,200)		Fine- to coarse-grained sandstone, conglomerate; carbonaceous shale and coal
			Dunvegan	300-1200	Marine and non-marine sandstone and shale
		Shaftesbury 400-900'	Cruiser Fm.[1]	350-800	Dark grey marine shale with sideritic concretions; some sandstone
			Goodrich Fm.[1]	50-1350	Fine-grained, crossbedded sandstone; shale and mudstone
			Hasler Fm.[1]	500?-1500	Silty, dark grey marine shale with sideritic concretions; siltstone and sandstone in the lower part; minor conglomerate
Lower Cretaceous		Commotion 1080-1600'	Boulder Creek Member	240-560	Fine-grained, well sorted sandstone; massive conglomerate; non-marine sandstone and mudstone
			Hulcross Member	0-450	Dark grey marine shale with sideritic concretions
			Gates Member	220-900	Fine-grained, marine and non-marine sandstones; conglomerate; coal; shale and mudstone
			Moosebar	100-1000	Dark grey marine shale with sideritic concretions; glauconitic sandstone and pebbles at base
Lower Cretaceous	Bullhead Group 0-2,500 feet (0-750 m)		Gething Formation	0-1,800 feet (0-540 m)	Fine-grained, cherty to quartzose sandstone; rusty weathering shale; carbonaceous mudstone and coal seams; minor conglomerate
			Cadomin Formation	0-770 feet (0-230 m)	Massive chert conglomerate and coarse-grained sandstone; carbonaceous shale; minor coal

Regional erosional unconformity; bevels rocks of succeedingly older age northward and eastward

TABLE 2

LIMITS OF SURFACE WEATHERING

Diamond Drill Hole D.D.H.	Limit of Over-Burden (m)	Dip ° From Directional	Approximate Limit of Oxidization from Geological Log		Accepted Limit (m)	Standing Water Level From Gamma-Ray/Neutron Log. (m)
			Apparent Distance (m)	True Distance (m)		
80-1	7.4	-55	10.0	8.2	10.0	N.D.
80-2	3.7	vertical	N.D.	-	N.D.	34.5
80-3	12.2	-60	17.0	14.7	20.0	N.D.
81-4	5.2	-62	12.0	10.6	15.0	N.D.
81-5	5.2	-65	16.0	14.5	20.0	3.0
81-6	6.7	-60	17.0	14.7	20.0	N.D.
81-7	3.7	-58	14.5	12.3	15.0	54.0
81-8	7.9	-57	9.0	7.5	10.0	13.0
81-9	4.0	-59	16.0	13.7	20.0	31.5
81-10	4.6	-58	10.0	8.5	10.0	10.0
81-11	4.9	-55	9.0	7.4	10.0	1.0
81-12	4.6	-57	10.0	8.4	10.0	11.0
81-13	3.4	-60	15.0	9.9	20.0	32.0
81-14	3.7	vertical	6.0	6.0	10.0	31.0
81-15	4.0	-60	23.0	15.2	25.0	making water
81-16	4.6	vertical	30.0	30.0	30.0	23.5
81-17	7.9	-60	6.0	4.0	10.0	17.0
81-18	6.0	-57	7.0	4.4	10.0	35.0
81-19	37.2	-62	N.D.	-	N.D.	0.0
81-20	6.6	-60	N.D.	-	10.0	8.0
81-21	8.5	-62	N.D.	-	N.D.	making water
81-22	3.0	-60	N.D.	-	N.D.	not logged
81-23	3.4	-61	11.5	7.8	15.0	0.0
81-24	4.0	-60*	10.0	6.6	15.0	54.3
81-25	25.0	-61	N.D.	-	N.D.	not logged
81-26	2.9	-60	23.0	15.6	25.0	19.0
81-27	8.8	-60	N.D.	-	N.D.	making water
81-28	3.2	-60	N.D.	-	N.D.	making water
81-29	26.2	-60	N.D.	-	N.D.	not logged
81-30	5.0	-60	N.D.	-	N.D.	making water
81-31	6.7	-61	N.D.	-	N.D.	0.0
81-32	7.5	-60	21.5	14.2	25.0	47.0
81-33	18.7	-61	31.0	21.0	35.0	0.
81-34	3.5	-61	6.0	4.1	10.0	77.0
81-35	4.5	-60	18.0	11.9	20.0	0.
81-36	10.1	-60*	N.D.	-	N.D.	35.0
81-37	3.5	-61	18.0	12.2	20.0	0.
81-38	3.1	-60	24.0	15.8	25.0	61.0
81-39	9.8	-60	11.0	7.3	15.0	0.
81-40	6.9	-60	6.0	4.0	10.0	0.
81-41	3.5	vertical*	6.0	6.0	10.0	36.0
81-42	3.4	vertical	9.0	9.0	10.0	N.D.
81-43	3.2	vertical	12.5	12.5	15.0	N.D.
81-44	3.4	-89	12.5	12.4	15.0	20.0
81-45	3.1	-57	7.0	4.4	10.0	8.0
81-46	11.0	vertical*	18.0	18.0	20.0	0.

*approximate

N.D. not determined

TABLE 3

DRILL HOLES SUMMARY

	Hole Number	Co-ordinates N / E	Coal License	Bearing Local Grid	Inclination °	Collar Elevation (m)	Total Depth (m)	Date Started	Date Finished	Coal Zones Intersected
	80-1	5003.0/5125.0	3992	West	-55	1092.0	248.2	Nov.19/80	Nov.24/80	5,6,7,8,10
	80-2	5006.0/5274.2	3992	-	Vertical	1112.8	260.0	Nov.25/80	Nov.30/80	5,6,7,8
	80-3	5002.3/5704.	3992	West	-60	1133.7	346.5	Jan. 8/81	Jan.17/81	1,2,3,4,5,6,7
	81-4	5398.4/5665.2	3992	West	-62	1100.1	295.7	Jan.18/81	Jan.22/81	1,2,4,5,6,7,8
	81-5	5596.5/5640.4	3992	West	-65	1083.5	282.5	Jan.23/81	Jan.28/81	1,2,4,5,6,7,8
	81-6	4799.4/5710.4	3991	West	-60	1129.3	323.1	Jan.29/81	Feb. 5/81	1,2,3,4,5,6,7
	81-7	5400.0/5120.0	3992	West	-58	1095.0	252.1	Feb. 6/81	Feb.13/81	5,6,7,8,9,10
PHASE	81-8	5600.0/5080.0	3992	West	-57	1088.7	136.2	Feb.14/81	Feb.16/81	5,6,7,8
	81-9	4397.1/5638.5	3991	West	-59	1158.8	328.3	Feb.18/81	Feb.23/81	1,2,3,4,5,6,7
I	81-10	3997.3/5679.8	3991	West	-58	1161.3	316.1	Feb.24/81	Mar. 2/81	1,2,3,4,5,6,7
	81-11	5003.2/5611.2	3992	West	-55	1121.0	154.5	Mar. 3/81	Mar. 5/81	1,2,4
	81-12	5005.9/5488.4	3992	West	-57	1113.8	66.1	Mar. 6/81	Mar. 7/81	4
	81-13	5203.3/5698.5	3992	West	-60	1129.8	352.3	Jul.22/81	Jul.27/81	1,4,5a,5b,6,7
	81-14	5197.0/5266.0(*)	3992	-	Vertical	1106.9	261.2	Jul.23/81	Jul.28/81	5,6,7
	81-15	4595.7/5698.6	3991	West	-60	1137.0	343.2	Jul.28/81	Aug. 2/81	1,3,4,5,6,7
	81-16	5404.5/5280.0	3992	-	Vertical	1083.2	297.4	Jul.29/81	Aug. 3/81	5,6,7
	81-17	4196.8/5767.1	3991	West	-60	1155.4(*)	337.1	Aug. 3/81	Aug. 7/81	1,3,4,5,6,7a,7b
PHASE	81-18	5814.0/5820.7	3992	West	-57	986.4	261.2	Aug. 4/81	Aug.10/81	1,4,5,6,7
	81-19	4997.7/6002.7	3991	West	-62	1105.4	513.6	Aug. 9/81	Aug.20/81	1,3,4,5,6,7
II	81-20	6006.5/5993.2	3992	West	-60	891.7	262.7	Aug.11/81	Aug.18/81	1a,1b,4,6,7
	81-21	6201.9/6088.3	3993	West	-62	851.8	299.3	Aug.19/81	Aug.25/81	1a,1b,4a,4b,4c,7a,7b
	81-22	4602.7/6059.5	3991	West	-60	1127.0	498.6	Aug.22/81	Sep. 2/81	1a,1b,4,5,6,7a,7b
34	81-23	6414.9/6142.5	3993	West	-61	823.4	285.6	Aug.26/81	Aug.31/81	1,4a,4b,"A",7a,7b
	81-24	6603.1/5905.7	3993	West	-60(*)	821.4	246.0	Sep. 1/81	Sep. 5/81	6,7a
	81-25	4794.2/6036.3	3991	West	-61	1113.1	540.1	Sep. 3/81	Sep.13/81	1,3,4,6,7,8
	81-26	6799.0/5900.0	3993	West	-61	794.1	178.0	Sep. 6/81	Sep. 8/81	5
	81-27	6806.0/6217.3	3993	West	-60	771.9	300.8	Sep. 9/81	Sep.13/81	1a,1b,3,4a,4b,4c,5,6,7a,7b
	81-28	6611.5/6202.9	3993	West	-60	795.9	251.7	Sep.14/81	Sep.20/81	1a,1b,4a,4b,"A",7a,7b
	81-29	5202.4/6025.8	3991	West	-60	1065.0	419.4	Sep.14/81	Sep.21/81	1,3,4,5,6,7
	81-30	6993.4/6198.1	3993	West	-60	748.4	255.1	Sep.21/81	Sep.24/81	1a,1b,4a,4b,"A",5,6,7a,7b
	81-31	5399.1/5937.6	3992	West	-61	999.0	361.2	Sep.23/81	Sep.29/81	1,3,4,6,7
	81-32	6402.0/5868.5	3992	West	-60	863.4	206.3	Sep.25/81	Sep.29/81	4a,4b,5,6,7a,7b
	81-33	5600.0/5895.0(*)	3992	West	-61	985.6(*)	294.4	Sep.30/81	Oct. 5/81	1,4,5,6,7
	81-34	6199.8/5777.0	3992	West	-61	909.3	191.1	Oct. 1/81	Oct. 4/81	4a,4b,5,6,7
	81-35	6003.3/5734.1	3992	West	-60	993.2	87.5	Oct. 5/81	Oct. 7/81	4
	81-36	5202.8/5517.1	3992	West	-60(*)	1099.3	385.9	Oct. 6/81	Oct.13/81	4,5,6,7
	81-37	6003.8/5731.0	3992	West	-61	993.2	239.9	Oct. 8/81	Oct.12/81	4,5,6,7
	81-38	5801.3/5609.8	3992	West	-60	1070.2	239.9	Oct.13/81	Oct.21/81	4,6,7
	81-39	5202.5/5519.9	3992	West	-60	1099.3	38.4	Oct.14/81	Oct.15/81	4
	81-40	4794.0/5256.6	3992	West	-60	1073.3	187.1	Oct.16/81	Oct.22/81	6,7a,7b
	81-41	7198.9/5934.5	3993	-	Vertical(*)	729.5	145.0	Oct.22/81	Oct.24/81	6,7
	81-42	4598.2/5328.5	3991	-	Vertical	1109.9(*)	120.7	Oct.23/81	Oct.25/81	5,6,7
	81-43	7400.0/5932.3	3993	-	Vertical	690.2	161.2	Oct.25/81	Oct.28/81	-
	81-44	4396.4/5401.5	3991	-	-89	1133.0(*)	157.3	Oct.26/81	Oct.29/81	5,6,7
	81-45	7400.4/6101.8	3993	West	-57	689.9	166.7	Oct.29/81	Nov. 1/81	7a,7b
	81-46	4208.1/5392.4	3990	-	Vertical	1141.3(*)	158.5	Oct.30/81	Nov. 4/81	5,6,7
							12,093.7			

(*) = approximate

TABLE 4

TRENCHING SUMMARY

Trench Number (Approx. Grid Northing)	Trench Length (m)	Sample Number	Seam True Width (m)	Coal Zone	Ash	Volatile Matter	Fixed Carbon	Sulphur	F.S.I.	B.T.U./lb	B.T.U./lb Dry	Analysis Report Number
					Dry Assay Results %							
7617	102.0	018079	0.7	-	14.66	19.89	65.45	0.68	0	10863	12340	22770
7575	4.6	018075	1.15	-	10.66	27.44	61.9	0.7	0	8235	11297	22744
7177	6.0	018076)	)	-	15.1	28.46	56.44	0.63	0	7758	10264	22744
		018077)	2.65)	1	11.16	27.62	61.22	0.54	0	8394	11212	22744
		018078)	)		47.62	19.55	32.83	0.39	0	4730	6098	22744
7060	56.3	018175	0.75	-	15.09	28.58	56.33	0.56	0	8116	10315	22677
		018176)			43.67	20.98	35.35	0.37	0	5755	6746	22677
		018177)	2.75	7a	12.27	24.21	63.52	0.56	0	9986	11467	22677
		018178 T			45.8	20.74	33.46	0.34	0	4805	6086	22677
		018179)	2.25	7b	20.01	26.17	53.82	0.53	0	7585	9883	22677
6960		018195	0.55)		20.07	29.55	50.38	0.56	0	7572	9531	22677
		018196	1.16)		12.79	30.5	56.71	0.52	0	8532	10763	22677
6959	58.0	018192	0.4)	7	47.74	17.98	34.28	0.33	0	5497	6156	22677
		018193	1.0)		12.09	25.49	62.42	0.56	0	7824	11220	22677
		018194	0.5)		23.69	24.92	51.39	0.63	0	7941	9548	22677
6940		018171	0.5 T		20.35	27.31	52.34	0.59	0	7200	9533	22636
		018172	1.2	5	14.81	29.65	55.54	0.54	0	7571	10212	22636
		018173	1.55		10.95	17.00	72.05	0.47	0	9321	11318	22636
		018174	1.35		33.73	21.61	44.66	0.56	0	6728	7981	22636
6592	70.2	018170	1.3	-	11.1	30.58	58.32	0.44	0	7644	10488	22636
6560		018169	1.05		16.79	25.33	57.88	0.43	0	8354	10765	22636
		018168	1.9	4	14.97	28.61	56.42	0.42	0	7380	10289	22677
		018167	1.2		11.1	30.58	58.32	0.44	0	7644	10488	22636
6500	30.0	018162	1.0	-	10.54	21.51	67.95	0.54	1.5	13033	13461	22636
		018163	1.0	-	13.66	22.06	64.28	0.51	1.0	11969	12891	22636
		018189			35.51	21.18	43.31	0.35	0	6202	7750	22677
		018190	2.8	1	7.7	27.08	65.22	0.44	0.5	10590	13045	22677
		018191			56.1	14.55	29.35	0.32	0	5325	5893	22677
6393		018166	0.6		28.02	27.88	44.1	0.71	0	6019	8417	22636
6377	20.0	018164	1.0	Part	13.2	19.71	67.09	0.43	0.5	12145	13020	22636
		018165	1.0	of 4	3.02	19.78	77.2	0.43	0	13275	14442	22636
6198		018160	1.1	-	16.89	27.4	55.71	0.43	0	7512	10216	22636
6174	105.0	018156			8.35	29.15	62.5	0.36	0	9053	12496	22636
		018157	4.5	4	8.3	24.38	67.32	0.33	0	8325	12608	22636
		018158			8.87	24.38	66.75	0.35	0	10581	12721	22636
		018159			9.98	23.88	66.14	0.36	0.5	11074	13011	22636
		018155	1.8		22.21	30.25	47.53	0.41	0	5642	8453	22636
		018161	1.1		21.22	28.6	50.18	0.51	0	6566	9213	22636
6120	13.0	018188	0.9	-	28.75	25.08	46.17	0.61	0	6371	8615	22677
		018187	1.0	-	12.74	30.11	57.15	0.59	0	7496	10583	22677
6095		018186	1.0	-	16.5	28.01	55.49	0.59	0	7908	10643	22677
6040	22.0	018183	0.7		24.94	31.29	43.77	0.53	0	6425	8962	22677
		018184	0.7	1	11.81	29.84	58.35	0.57	0	7949	11056	22677
		018185	2.9		13.1	29.43	57.47	0.34	0	7585	10840	22677
6000		018182	0.9	-	19.3	28.15	52.55	0.8	0	7376	10064	22677
5983	8.0	018180	0.7	-	13.37	29.44	57.19	0.68	0	8040	11015	22677
		018181	0.6	-	15.86	29.3	54.86	0.65	0	7033	10305	22677
5979		018151	1.1	-	11.41	30.23	58.36	0.53	0	7546	10765	22636
5976		018152	2.6	1	8.77	27.72	63.51	0.38	0	10720	12497	22636
5974	42.5	018153	0.75	-	13.26	29.04	57.7	0.66	0	8316	10991	22636
5961		018154	0.75	-	17.48	30.68	51.84	0.67	0	6921	9864	22636
5920		018062	0.8	-	14.97	23.1	61.93	0.57	0	7746	10613	22710
5910	11.0	018059			7.57	30.13	62.30	0.34	0	9138	11620	22677
		018060	2.75	1	4.46	27.72	67.82	0.34	0	10830	13062	22677
		018061			2.07	28.37	69.56	0.39	0	12250	13816	22677
5870	10.0	018057	0.6	-	15.47	30.01	54.52	0.49	0	7157	9929	22677
		018058	0.4	-	6.43	26.53	67.04	0.67	0	10599	12805	22677
5850		018055	0.6	-	15.42	30.51	54.07	0.47	0	6900	9902	22677
	12.5	018056	0.53	-	18.17	29.58	52.25	0.56	0	7011	9848	22677
5830		018053	0.8	-	16.79	30.13	53.08	0.52	0	6710	9564	22677
		018054	0.57	-	17.25	30.39	52.36	0.64	0	6285	9655	22677
5800	3.0	018197	0.45	-	12.33	30.08	57.59	0.87	0	8905	11546	22677
		018198	0.45	-	22.05	24.44	53.51	0.73	0	8865	10457	22677
5796		018199	0.55	-	13.06	29.66	57.28	0.5	0	7445	10284	22677
		018200	0.4	-	9.23	30.66	60.11	0.67	0	9411	11888	22677
5790	20.5	018051	2.95	1	13.76	31.34	54.9	0.42	0	6991	9997	22677
		018052			8.97	28.84	62.19	0.39	0	9093	11674	22677
5080	9.0	018073	0.55	Part	22.05	25.74	52.21	0.63	0	6757	9679	22710
		018074	0.5	of 1	15.14	26.97	57.89	0.63	0	7087	10280	22710
4616	4.0	018066	0.45		15.08	22.43	62.49	0.55	0	7602	10267	22710
		018067	0.45	1	25.22	25.08	49.7	0.48	0	6561	8791	22710
		018068	0.6		18.42	27.49	54.09	0.41	0	6877	9437	22710
		018069	0.6		9.15	28.79	62.06	0.52	0	8508	11292	22710
4320	23.0	018070			11.86	24.96	63.18	0.39	0	9004	11117	22710
		018071	2.65	1	6.1	25.54	68.36	0.39	0	11094	13169	22710
		018072			15.07	22.03	62.9	0.4	0.5	11122	12385	22710
3800	131.0	018063			20.7	22.73	56.57	0.31	0	8258	10529	22710
		018064	3.0	1	10.7	22.55	66.75	0.38	1.0	11429	13146	22710
		018065			34.31	17.06	48.63	0.35	1.0	8559	9601	22710
	761.6m											

River area on and in the vicinity of coal licences 3986-3993, 6792, 7191, 7192 (see Figure 6). 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).

Local Geology

The David Minerals Ltd. coal licences cover the northern part of the Willow Creek anticlinorium and are underlain mostly by rocks of the Lower Cretaceous Gething Formation, the coal bearing upper member of the Bullhead Group. (see Table 1) The anticlinorium is defined by rocks of the Bullhead and Fort St.John Groups. The contact between the groups is marked by a thin bed of chert pebble conglomerate (Blue Sky Conglomerate) which is well exposed on licence 3987 in trench 3 (Jones, 1980) and on licence 3992 in outcrop and in most of the eastern diamond drill holes (Fig. 4a,b,c). This conglomerate marker bed designates the top of the Gething Formation and was used in correlating drill hole intersections on the property (see Figure 29)

Down hole geophysics enabled good correlation between coal zones. This data has been plotted on sections drawn at 200 m intervals from 4000N to 7600N (see Figures 7-25)

Interpretation of the geology from the above work indicates a small, gentle fold on the east limb of the much broader Willow Creek Anticline. (see section 5000N, Fig.20) The synclinal axis is marked by a fault/shear zone that is visible in a road cut 20m east of DDH80-1 and in drill hole 81-26. A north-south trending gulley is its topographic expression.

Overburden thickness ranges from 1 to 9 metres over most of the area where holes were collared into the Gething Formation. Holes collared into the overlying Moosebar Formation mudstones indicated a greater quantity of overburden (10-38m) (Table 2)

Bedrock appears to be oxidized to 35m in places but averages 15 metres from the surface (Table 2)

Coal Development

Eight major coal zones (greater than/equal to 1.5m) were found by trenching and drilling. Coal zones 1, 4 & 7 show the most continuity along strike and dip and are traceable from 4000N to 7600N. Coal zones 5 and 6 show a slightly shorter strike length while zones 2, 3 and 8 are the least continuous (see Figures 7-25 and 29)

The term 'coal zone' was used to separate coal seams with waste partings from clean 'coal seams'. (see Figures 7-24)

The correlation charts summarize the geology in the drilling area and illustrate the size and location of the major coal zones (Figures 27, 28)

A summary of the size, recovery and quality of the eight major coal zones is tabulated in Tables 5, 6a, 6b.

COAL QUALITY

Sampling Procedure

Coal zone intervals were documented (geological and geophysical logging) immediately after the drillings shifts. The coal was sampled from the hanging wall to the footwall in its entirety if the coal seam was $\geq$ 1.5m wide or, if narrower, but near a major coal zone. If it was larger than 1.5m it was sampled to the end of the first run length, the next sample to the end of the next run length, etc. Large partings ($>$10cm) were omitted from the sample but recorded in the geological logs in all cases.

When sampling from each hole was completed, they were sent by Greyhound bus to Loring Laboratories of Calgary. A sample result turnaround period for a sample shipment averaged 3 weeks.

A summary of the coal quality has been tabulated in two tables (see Table 6A and 6B). Table 6A is documented on a sample by sample basis whereas Table 6B is an average of coal quality by seam number.

Coal Resources

The Bumines and U.S.G.S. definition and classification scheme for total resources was used for resource calculations (Appendix I, Phase I report, Marton and Jones 1980). Table 7 illustrates the data used to determine the measured, indicated and inferred resources (Figure 30)

The widths of all coal seams and zones were noted when logging the drill core, then tabulated (Table 5). Using

TABLE 5

SUMMARY OF COAL ZONE DIMENSIONS

Local Grid Northing	Diamond Drill Hole	Geological Log Apparent Width (m)	Recovery %	Geophysical Log Apparent Width (m)	Accepted Coal Zone True Width (m)
		ZONE ONE			
7000	81-30	A. 1.6/2.6 B. 1.7	94	A. 1.8/2.5 B. 1.6	A. 1.8/2.5 B. 1.6
6800	81-27	A. 1.9/2.4 B. 1.7	100	A. 1.4/2.3 B. 1.6	A. 1.5/2.3 B. 1.6
6600	81-28	A. 1.6/1.9 B. 2.0	84	A. 1.6/1.9 B. 1.6	A. 1.6/1.9 B. 1.6
6400	81-23	3.8/4.3	100	3.7/4.2	3.8/4.2
6200	81-21	A. 1.0 B. 2.7	66	A. 1.0 B. 2.8	A. 1.0 B. 2.8
6000	81-20	A. 1.5 B. 3.8	65	A. 1.7 B. 3.4	A. 1.8 B. 3.4
5800	81-18	1.5	83	2.7	2.7
5600	81-5 81-33	1.0 2.8	90 95	4.2/5.9 3.1	4.2/5.9 3.1
5400	81-4 81-31	2.3 2.9	87 95	2.7 3.0	2.7 3.0
5200	81-13 81-29	2.5 2.9	95 100	2.4 2.4	2.2 2.4
5000	80-3 81-11 81-19	2.25 3.1 2.3	77 55 87	2.6 2.5 2.8	2.6 2.5 2.8
4800	81-6 81-25	2.9 2.8	94 96	2.9 2.3	2.9 2.3
4600	81-15 81-22	2.5 0.8/1.0	95 87	2.7 1.0	2.7 1.0
4400	81-9	3.2	65	2.6	2.6
4200	81-17	3.0	85	2.4	2.4
4000	81-10	3.45	74	3.5	3.5

TABLE 5 .. continued

Local Grid Northing	Diamond Drill Hole	Geological Log Apparent Width (m)	Recovery %	Geophysical Log Apparent Width (m)	Accepted Coal Zone True Width (m)
		Z O N E T W O			
5600	81-5	1.0	97	2.3	2.3
	81-33	1.8/3.0	98	1.9/3.6	1.9/3.6
5400	81-4	2.3	88	2.0	2.2
	81-31	2.2/2.8	100	1.6/2.6	2.2/2.8
5200	81-13	1.0	98	1.8/2.7	1.8/2.7
	81-29	1.6/2.9	96	1.9/2.5	1.9/2.5
5000	81-11	2.6	90	2.9	2.0
	81-19	1.3/2.3	100	1.7/2.3	1.7/2.3
4800	81-6	1.4/1.6	90	2.5/3.1	2.5/3.1
	81-25	2.2	90	1.5/1.9	1.5/1.9
4600	81-15	1.4	97	1.5/2.0	1.5/2.0
	81-22	1.2	92	1.8	1.8
4400	81-9	1.0	50	1.3	1.3
4200	81-17	1.4/1.7	98	1.9/2.4	1.9/2.4
4000	81-10	0.9	90	1.2	0.6/1.2
		Z O N E T H R E E			
5800	81-27	1.0	100	1.2	1.2
5400	81-31	2.2	79	1.8	1.9
5200	81-29	3.0	83	1.8	1.8
5000	80-3	1.85	69	2.0	2.0
	81-11	2.15	84	1.8	1.8
	81-19	2.6	100	1.8	1.8
4800	81-6	2.6	87	2.0	2.0
	81-25	2.1	73	2.2	2.2
4600	81-15	1.8	100	1.9	1.8
	81-22	2.4	64	2.4	2.4
4400	81-9	1.1	67	2.0	2.0
4200	81-17	2.3	90	2.1	2.1
4000	81-10	4.5	66	4.5	4.5

Local Grid Northing	Diamond Drill Hole	Geological Log Apparent Width (m)	Recovery %	Geophysical Log Apparent Width (m)	Accepted Coal Zone True Width (m)
		Z O N E F O U R			
7000	81-30	A. 1.4 B. 2.0 C. 1.5	78	A. 1.2 B. 2.0 C. 1.5	A. 1.2 B. 2.0 C. 1.5
6800	81-27	A. 1.7/1.8 B. 2.05 C. 1.2/1.7	70	A. 1.7 B. 2.0 C. 1.2/1.6	A. 1.7 B. 2.0 C. 1.2/1.6
6600	81-28	A. 1.5 B. 3.8/5.1	70	A. 2.2 B. 1.7	A. 2.2 B. 1.7
6400	81-23	A. 1.9/2.7 B. 3.5/4.3	93	A. 1.7/2.7 B. 3.4/4.6	A. 1.7/2.7 B. 3.4/4.6
	81-32	no recovery	0	A. 1.0 B. 1.2	A. 1.0 B. 1.2
6200	81-21	A. 0.4 B. 5.8 C. .55/.6	67	A. 1.3 B. 2.5 C. 2.7	A. 1.3 B. 2.5 C. 2.7
	81-34	no recovery	0	A. 1.5 B. 1.1	A. 1.5 B. 1.1
6000	81-20	1.3	93	1.0	1.0
	81-35	3.1/4.6	12	6.8/7.6	6.8/7.6
	81-37	6.7/8.1	27	6.5/7.5	6.5/7.5
5800	81-18	5.4	64	5.4	5.4
	81-38	2.3	78	2.3	2.3
5600	81-5	A. 3.4 B. 3.0	82	A. 3.7 B. 2.5	A. 3.7 B. 2.5
	81-33	3.4/3.8	82	3.6	3.5
5400	81-4	3.85	90	3.8	3.8
	81-31	2.9	85	3.0	3.0
5200	81-13	3.3	86	4.3	4.3
	81-29	4.1	68	3.8	3.8
	81-36	2.85	23	3.0	3.0
	81-39	3.2	100	3.0	3.0
5000	80-3	4.0	32	5.2	5.2
	81-11	4.0	94	3.3	3.3
	81-12	1.9	34	2.5	2.5
	81-19	3.9	93	3.6	3.6
4800	81-6	3.7	70	4.0	4.0
	81-25	3.0	73	3.0	3.0

TABLE 5 .. continued

Local Grid Northing	Diamond Drill Hole	Geological Log Apparent Width (m)	Recovery %	Geophysical Log Apparent Width (m)	Accepted Coal Zone True Width (m)
		Z O N E F O U R cont'd.			
4600	81-15	2.1/3.4	93	2.7/3.2	2.7/3.2
	81-22	2.4	64	3.0	3.0
4400	81-9	1.5	50	A. 0.5 B. 1.3	A. 0.5 B. 1.3
4200	81-17	1.8/2.0	100	1.7/2.0	1.7/2.0
4000	81-10	1.5	65	2.8	2.8
		Z O N E F I V E			
7000	81-30	1.05	100	1.0	1.0
6800	81-26	1.1	100	1.3	1.3
	81-27	.9	100	.8	1.0
6400	81-32	1.1	85	1.6/2.0	1.6/2.0
6200	81-34	1.7/2.2	87	2.2/2.8	2.2/2.8
6000	81-37	2.3	100	2.3	2.5/2.7
5800	81-18	1.8/2.2	90	2.0/2.5	2.0/2.5
5600	81-5	2.3	100	A. 1.1 B. 0.9	A. 1.1 B. 0.9
	81-8	No recovery	0	2.9/3.5	2.9/3.5
	81-33	1.7/2.5	100	1.9/2.8	1.9/2.8
5400	81-4	1.7	100	2.1	2.1
	81-7	1.35	78	2.0	2.0
	81-16	2.8/3.3	100	2.1/2.6	1.9/2.4
5200	81-13	A. 1.7 B. 1.7/1.9	95 82	A. 1.6 B. 1.6/2.0	A. 1.6 B. 1.6/2.0
	81-14	3.8/4.0	82	2.5/2.9	2.1/2.9
	81-29	2.1	87	0.9/1.6	0.9/1.6
	81-36	2.2/2.7	100	1.9/2.2	1.9/2.2
5000	80-1	No recovery	0	2.4	2.1
	80-2	2.0	93	2.3	2.3
	80-3	1.9	95	1.9	1.9
4800	81-6	1.7	95	1.9	1.9

Local Grid Northing	Diamond Drill Hole	Geological Log Apparent Width (m)	Recovery %	Geophysical Log Apparent Width (m)	Accepted Coal Zone True Width (m)
		Z O N E F I V E cont'd.			
4600	81-15	1.6	95	1.6	1.6
	81-22	0.9/1.0	90	1.2	1.2
	81-42	1.7/1.8	87	2.3	1.8/2.1
4400	81-9	0.7	93	Not determined	Not determined
	81-44	1.2	80	2.4	2.4
4200	81-17	0.9	91	1.2	1.2
	81-46	1.2	60	1.8	1.3
4000	81-10	4.3	99	2.5	2.5
		Z O N E S I X			
7200	81-41	2.6	66	2.5	2.4
6800	81-27	0.8	100	1.0	1.0
6600	81-24	1.9	78	1.7	1.7
6400	81-23	1.0	100	0.8	0.8
	81-32	1.0	75	1.2	1.2
6200	81-34	0.7	80	2.2/3.2	1.6/2.3
6000	81-20	1.0	60	1.5/2.8	1.5/2.8
	81-37	2.3/2.5	66	2.4/2.8	2.4/2.8
5800	81-18	2.6/3.2	95	2.9/3.3	2.5/2.9
	81-38	2.1/2.7	88	2.0/2.6	1.5/2.0
5600	81-5	3.45	88	2.7	2.7
	81-8	3.10	94	2.4	2.4
	81-33	2.5/2.7	100	2.4/2.6	2.0/2.6
5400	81-4	2.45	97	2.6	2.6
	81-7	3.0	96	2.9	2.9
	81-16	3.5	100	3.1	2.7
	81-31	1.9	69	2.9	2.4/2.9
5200	81-13	2.6	100	2.9	2.9
	81-14	3.8	98	3.6	3.1
	81-29	2.5	100	2.0	2.0
	81-36	2.85	77	2.7	2.7

Local Grid Northing	Diamond Drill Hole	Geological Log Apparent Width (m)	Recovery %	Geophysical Log Apparent Width (m)	Accepted Coal Zone True Width (m)
		Z O N E S I X cont'd.			
5000	80-1	2.2	68	2.7	2.7
	80-2	3.2	95	3.0	3.0
	80-3	3.5	95	3.5	3.5
	81-19	2.6	90	2.4	2.4
4800	81-6	2.5	100	2.6	2.6
	81-25	2.0	100	2.2	2.2
	81-40	4.4/4.7	62	4.0	3.1
4600	81-15	1.7	88	2.0	2.0
	81-22	1.6	72	1.7	1.7
	81-42	2.6	95	2.8	2.5
4400	81-9	1.8	90	1.1	1.1
	81-44	2.6	100	2.5	2.5
4200	81-17	1.9	93	1.5	1.5
	81-46	5.0	71	5.3	2.0
4000	81-10	2.2	99	1.3	1.3
		Z O N E S E V E N			
7400	81-45	A. 0.85 B. 2.25/2.3	83	A. 0.6 B. 1.6	A. 0.6 B. 1.6
7200	81-41	2.8/3.7	85	2.3/3.7	2.2/3.3
7000	81-30	A. 1.3 B. 2.0/3.4	92	A. 1.1 B. 2.4/3.7	A. 1.1 B. 2.4/3.7
6800	81-27	A. 2.6/4.4 B. 1.0/1.8	100	A. 2.6/3.9 B. 0.8	A. 2.6/3.9 B. 0.8
6600	81-24	A. 2.3 B. 0.7	100	A. 2.0/2.3 B. 0.6	A. 2.0/2.5 B. 0.6
	81-28	A. 2.6/3.5 B. 1.0	80	A. 2.9/3.7 B. 0.9	A. 2.9/3.7 B. 0.9
6400	81-23	A. 2.5 B. 1.2	93	A. 2.4/2.6 B. 1.0	A. 2.6 B. 1.0
	81-32	A. 1.8/3.5 B. No recovery	85	A. 3.6/5.0 B. 1.1	A. 3.6/5.0 B. 1.1
6200	81-21	A. 3.4 B. 0.9	80	A. 3.1/3.4 B. 1.0	A. 3.1/3.4 B. 1.0
	81-34	4.1/5.6	68	3.1/5.0	3.1/5.0

Location Local Grid Northing	Diamond Drill Hole	Sample No.	Geological Interval (m)	Apparent Width (m)	Ash (Dry Basis)	Volatile Matter (Dry Basis)	Fixed Carbon Value (Dry Basis)	Sulphur %	F.S.I.	B.T.U./lb Moist/or As received	B.T.U./lb (Dry)	Analysis Report Number
					SEAM SEVEN continued							
5000	*80-1	405	71.2 - 71.9	7.2	1.49	16.61	81.9	0.64	1.0	15,029	15,356	64-19879
		406	72.5 - 74.1		4.53	16.59	78.88	0.49	1.0	14,212	14,783	64-19880
		407	74.4 - 75.6		3.39	15.61	81.0	0.51	0.5	14,168	15,031	64-19881
		408	77.0 - 78.4		2.96	16.63	80.41	0.72	1.5	14,321	15,040	64-19882
	*80-2	427	124.0 -124.7	6.8	7.33	17.05	75.62	0.7	1.5	14,111	14,415	64-19901
		428	127.2 -128.7		2.02	42.75	55.23	0.47	-	14,656	15,102	64-19902
		429	128.7 -129.4		2.01	16.41	81.58	0.47	-	14,737	15,133	64-19903
		430	129.5 -130.8		1.75	16.09	82.16	0.45	1.0	14,439	14,886	64-19904
	*80-3	450	310.8 -311.5	5.5	5.11	14.82	80.07	0.5	-	13,786	14,575	64-19924
		451	311.5 -312.2		2.38	15.07	82.55	0.42	-	14,190	15,096	64-19925
		452	312.2 -313.0		2.41	16.25	81.34	0.39	1.5	14,620	15,220	64-19926
		453	313.0 -314.6		25.2	13.39	61.41	0.34	0.5	10,762	11,155	64-19927
		454	315.0 -316.3		3.02	15.54	81.44	0.59	1.0	14,420	14,968	64-19928
	81-19	58727	406.1 -407.4	5.5	5.71	15.15	79.14	0.48	-	14,180	14,527	22336
		58728	407.4 -408.8		6.56	6.56	76.88	0.42	1.5	14,125	14,428	22336
		58729	408.8 -410.1		7.82	15.09	77.09	0.39	-	13,874	14,195	22336
		58730	410.3 -411.6						1.5	14,185	14,445	22336
4800	*81-6	97901	290.2 -291.7	5.7	2.12	15.73	82.15	0.4	-	14,590	15,094	64-20059
		97902	291.7 -293.2		20.05	15.53	64.42	0.37	1.0	10,653	11,648	64-20060
		97903	293.2 -294.1		29.16	14.35	56.49	0.5	-	10,277	10,999	64-20061
		97904	294.2 -294.8		9.39	23.25	67.36	0.64	1.0	13,662	14,150	64-20062
		97905	294.95-295.9		4.4	15.97	79.63	0.43	1.0	13,906	14,811	64-20063
	81-25	58812	422.4 -424.3	3.8	9.27	17.66	73.07	0.47	1.5	13,757	14,075	22454
		58813	424.8 -426.2		8.73	17.83	73.44	1.36	2.0	13,422	14,062	22454
	81-40 A	64700	155.4 -156.7	4.4	3.13	14.86	82.01	0.49	0.5	13,634	14,700	22677
		64715	156.7 -158.7		10.37	14.56	75.07	0.44	0.5	13,137	13,820	22677
		64716	158.7 -159.8		3.12	14.82	82.06	0.4	0.5	14,045	15,004	22677
	B	64717	160.5 -162.8	2.3	3.39	16.2	80.41	0.7	1.5	14,236	14,982	22677
4600	81-15	58866	283.5 -284.0	6.7	5.74	15.86	78.40	0.63	1.5	14,524	14,704	22203
		58867	284.5 -286.0		6.5	14.74	78.76	0.44	-	14,059	14,400	22203
		58868	286.0 -287.8		3.38	16.08	80.54	0.42	1.5	14,370	14,717	22454
		58869	288.0 -288.4		25.34	14.4	60.26	0.41	-	11,145	11,357	22454
		58870	288.7 -290.2		1.7	16.19	82.11	0.47	2.0	14,286	14,687	22454
	81-22 A	453	440.4 -441.9	1.5	4.68	15.67	79.65	0.41	0.5	14,422	14,770	22454
	B	454	447.0 -448.2	1.2	3.62	16.60	79.78	0.72	2.0	14,543	14,968	22454
	81-42	64751	95.5 - 98.0	8.1	4.02	15.57	80.41	0.49	1.0	13,975	14,712	22677
		64752	98.0 -100.7		6.02	14.8	79.18	0.42	1.0	13,772	14,468	22677
		64753	101.2 -103.6		2.76	15.76	81.48	0.6	1.0	14,023	15,062	22677
4400	*81-9	97624	265.5 -267.5	5.35	6.03	16.84	77.13	0.38	1.0	13,593	14,389	64-20102
		97625	267.7 -268.0		4.11	16.54	79.35	0.45	1.0	14,063	14,867	64-20103
		97626	269.2 -270.85		2.07	16.33	81.6	0.57	1.0	14,849	15,315	64-20104
	81-44	64757	140.1 -143.3	8.7	4.26	15.57	80.17	0.44	-	13,747	14,685	22710
		64758	143.3 -145.6		6.97	17.48	75.55	0.34	1.5	13,138	14,358	22710
		64759	147.1 -148.9		4.82	16.4	78.78	0.54	2.0	13,896	14,719	22710
4200	81-17 A	59523	283.6 -285.6	4.7	20.19	13.78	66.03	0.59	0.5	12,039	12,356	22269
		59524	285.6 -288.3		2.72	16.47	80.81	0.59	1.0	13,690	15,149	22269
	B	59525	292.8 -294.0	1.2	1.76	15.94	82.3	0.76	1.5	14,907	15,222	22336
	81-46	64769	128.0 -133.2	15.8	1.67	18.06	80.27	1.22	1.0	14,428	15,286	22744
		64770	133.2 -135.9		1.02	18.2	80.78	1.05	2.0	14,356	15,353	22744
		64771	135.9 -139.3		1.59	17.32	81.09	0.85	2.0	14,478	15,324	22744
		64772	139.3 -141.4		1.75	18.37	79.88	0.68	2.0	14,467	15,283	22744
		64773	141.4 -143.8		4.04	20.17	75.79	0.66	2.5	14,234	14,945	22744
4000	*81-10 A	97641	263.6 -264.3	3.65	2.19	19.34	78.47	0.99	1.5	14,904	15,193	64-20125
		97642	264.3 -267.25		3.4	17.88	78.72	1.42	1.0	14,305	14,899	64-20126
	B	97643	273.4 -274.75	1.35	3.66	16.61	79.73	0.76	1.0	14,247	14,926	64-20127
			Average:		7.97	15.63	76.58	0.60	1.0	13,760	14,324	
					SEAM "A"							
7000	81-30	483	145.4 -146.7	1.3	6.75	19.78	73.47	0.58	4.0	13,991	14,379	22516
6800	81-27	58843	167.7 -169.2	1.5	30.62	17.04	52.34	0.51	2.0	9,980	10,469	22454
6600	81-23	58789	160.85-162.5	2.25	10.24	19.84	69.92	0.68	4.5	12,975	13,541	22386
		58790	162.5 -163.1		9.66	19.04	71.3	0.71	4.5	13,483	13,966	22386
6400	81-28	58817	176.2 -177.4	1.2	10.57	18.76	70.67	0.67	3.0	13,420	13,752	22454
6200	81-21	58770	172.0 -172.7	1.8	25.22	17.91	56.87	0.73	5.0	11,665	11,877	22386
		58771	172.9 -173.8		11.8	18.11	70.09	0.71	2.5	13,376	13,670	22386
			Average:		14.98	18.75	66.38	0.66	3.6	12,699	13,093	

TABLE 6B

ADDITIONAL COAL QUALITY CHARACTERISTICS

Seam	Average Thickness Phase I (m)	Average Thickness Phase I (ft)	Average Thickness Phase II (m)	Average Thickness Phase II (ft)	Calorific Value Dry B.T.U. Phase I	Calorific Value Dry B.T.U. Phase II	Total Moisture Phase I	Total Moisture Phase II As Rec'd	Total Moisture Phase II Air Dyed	Fuel Ratio Fe Volatile % I	Fuel Ratio Fe Volatile % II	Ash I	Ash II	Sulphur I	Sulphur II	Nitrogen I	Nitrogen II	Hardgrove Grindability Index I	Hardgrove Grindability Index II	FUSION TEMPERATURE OF ASH Initial Deformation Reducing	Initial Deformation Oxidizing	Softening (H=W) Reducing	Softening (H=W) Oxidizing	Softening (H=½W) Reducing	Softening (H=½W) Oxidizing	Fluid Reducing	Fluid Oxidizing	Ash Composition Na_2O%	F.S.I.	Fluidity
#1	2.6	8.4	2.9	9.5	13,800	14,166		3.44	0.72	3.04	2.95	7.60	8.06	0.46	0.50			79.0	108.0	2300	2532	2397	2588	2478	2640	2560	2677	2.86	4.5	
#2	1.5	4.9	2.0	6.6	11,852	13,202		2.75	0.58	2.79	2.72	25.67	14.49	0.54	0.59				93.0									1.56	5.8	
#3	2.5	8.3	2.5	8.2	13,202	13,912		4.14	0.63	3.09	3.33	11.25	8.71	0.42	0.43			85.5	92.0	2128	2258	2258	2393	2395	2518	2545	2640	0.62	1.7	
#4	3.6	12.0	3.6	11.8	14,345	13,839		4.23	0.76	3.48	3.51	7.15	10.10	0.49	0.48			80.0	94.0	2100	2337	2177	2417	2252	2502	2373	2565	2.07	2.96	
#5	2.2	7.3	2.0	6.6	13,802	14,216		3.46	0.57	4.18	4.38	12.91	8.31	0.63	0.70				82.0									1.37	1.23	
#6	2.8	9.0	2.2	7.2	14,440	14,323		3.90	0.65	4.39	4.69	7.90	7.30	0.60	0.62				65.0									1.66	0.89	
#7	4.7	15.5	4.3	14.1	14,181	14,324		4.00	0.67	4.40	4.90	8.42	7.97	0.61	0.60			62.7	71.0	2387	2455	2507	2602	2617	2673	2680	2700	1.35	1.0	
#8	1.3	4.3	2.4	7.9	12,537	-				4.48	-	18.27	-	0.82	-														-	
"A"			1.5	4.9		13,093		3.10	0.92	-	3.54	-	14.98	-	0.66														3.0	
*Ave.	3.1		2.9		13,962	14,130		3.86	0.66	3.76	3.96	9.20	8.40	0.54	0.56			76.8		2238°F		2341°F		2439°F		2540°F		1.68%	2.1	

*Seams #2, 8 and "A" are not included in calculations of averages.

Fusion Temperature Ash

Test performed on samples from Phase I

**Ash composition tests on samples from Phase II

this data the average width of each seam was calculated for each section and then averaged over the entire drill area.

The average coal seam widths are as follows:

Seam No.	Overall Width (m)	(ft)
1	3.0	9.8
2	2.0	6.6
3	2.5	8.2
4	3.6	11.8
5	2.0	6.6
6	2.2	7.2
7	4.2	13.8
8	2.4	7.9

For tonnage calculations a specific gravity of 1.3 was used from sidewall densilog data.

Total Resources

The following resources were calculated using Table 7. (see Figure 30)

Resources Measured	46,613,190	tonnes
Resources Indicated	12,927,759	"
Resources Inferred	13,021,476	"
Total Coal Resources	72,562,425	"

CONCLUSIONS

Results of the Phase I and Phase II exploration programs on the Willow Creek Coal licences indicate that eight

TABLE 7

TOTAL COAL RESOURCES - CALCULATIONS

Coal Seam	Strike Length From	Strike Length To	Total	Average Dip Length	Average Width	S.G.	Tonnes
#1							
Measured	7300N	3500N	3800m	467m	3.0m	1.3	6,920,940
Indicated	6300N	3200N	3100m	263m	3.0m	1.3	3,179,670
Inferred a	5900N	5300N	600m	47m	3.0m	1.3	109,980
" b	4500N	2600N	1900m	351m	3.0m	1.3	2,600,910
							12,811,500
#2							
Measured	5700N	4100N	1600m	342m	2.0m	1.3	1,422,720
Indicated	4900N	3400N	800m	291m	2.0m	1.3	605,280
Inferred	4500N	2600N	1900m	327m	2.0m	1.3	1,615,380
							3,643,380
#3							
Measured	5500N	3700N	1800m	499m	2.5m	1.3	2,919,150
Indicated	5100N	3400N	1700m	281m	2.5m	1.3	1,552,525
Inferred	4500N	2600N	1900m	310m	2.5m	1.3	1,914,250
							6,385,925
#4							
Measured	7300N	3700N	3600m	550m	3.6m	1.3	9,266,400
Indicated	6100N	3400N	2700m	216m	3.6m	1.3	2,729,376
Inferred	4500N	2600N	1900m	257m	3.6m	1.3	2,285,244
							14,281,020
#5							
Measured	6500N	3700N	2800m	539m	2.0m	1.3	3,923,920
Indicated a	5900N	5300N	600m	137m	2.0m	1.3	213,720
" b	4900N	4500N	400m	90m	2.0m	1.3	93,600
" c	4100N	3400N	700m	300m	2.0m	1.3	546,000
Inferred	4500N	2600N	1900m	148m	2.0m	1.3	731,120
							5,508,360
#6							
Measured	6300N	3700N	2600m	829m	2.2m	1.3	6,164,444
Indicated a	6100N	5300N	800m	116m	2.2m	1.3	265,408
" b	5100N	3400N	1700m	218m	2.2	1.3	1,059,916
Inferred	4500N	2600N	1900m	213m	2.2m	1.3	1,157,442
							8,647,210
#7							
Measured	7500N	3700N	3800m	692m	4.2m	1.3	14,357,616
Indicated a	6100N	5700N	400m	235m	4.2m	1.3	513,240
" b	4700N	3400N	1300N	288m	4.2m	1.3	2,044,224
Inferred a	6500N	6100N	400m	125m	4.2m	1.3	273,000
" b	4500N	2600N	1900m	225m	4.2m	1.3	2,334,150
							19,522,230
#8							
Measured	5900N	4700N	1200m	300m	2.4m	1.3	1,123,200
Indicated	6300N	5900N	400m	100m	2.4m	1.3	124,800
							1,248,000
'A'							
Measured	7300N	6100N	1200m	220m	1.5m	1.3	514,800

Total Measured	=	46,613,190
Total Indicated	=	12,927,759
Total Inferred	=	13,021,476
Total Coal Resources	=	72,562,425

significant coal zones are present. The total of all measured, indicated and inferred coal resources are 72,562,425 tonnes.

Assays indicate the coal to be low to medium volatile bituminous grade, averaging 14,000 BTU's per lb., 0.6% sulphur and low ash.

It is concluded that additional diamond drilling is necessary to better define the locality of coal zones one, four and seven on the northern end of the property near the railroad tracks. This information would aid in the collaring of proposed adits which would be used for bulk sampling of the coal zones.

It is also concluded that the untested southern part of the property should be diamond drilled to extend the coal resources to the property boundary.

It is concluded that underground testing of the coal zones should follow the completion of this drilling.

Recommendations

A two-part third phase program is recommended (Fig. 31)

Part III(A)

1. Construct a year round access road between 'EZ' bridge and portal site before or after spring break-up when the ground is dry.

2. Establish a trailer camp on the property near the proposed portal entrance (Fig. 29)

3. Complete the drilling necessary to accurately locate coal seams 1, 4 and 7 in the vicinity of the portal sites. Conduct backhoe trenching where necessary to help define geology and coal seams. Estimate 1500m of drilling is required.

Part III(B)

1. Drive adits for bulk sampling purposes on the major coal zones. Estimate 760m of drifting.

2. Diamond drill the untested southern portion of the property from section 4000N to 2600N, the property boundary. Estimated 4100m of drilling.

3. Trench coal zones with a backhoe in the southern drill area where necessary for planning the drill program.

Cost Estimate

Phase III(A) approx. 6 week program

Road Construction - 5 km.	$ 200,000
Diamond Drilling - 1500m @ $140/m	210,000
Bulldozing - $80/hr x 45 days	36,000
Backhoeing - 10 days @ $500/day	5,000
Sampling & Assaying	5,000
Downhole Geophysical	35,000
Geological Engineering & Supervision	20,000
Swampers	9,000
Water Haulage	24,000
Camp	20,000
Vehicles	6,000
Fuel	10,000
Travel	5,000
Data Compilation, Reports, Drafting	20,000
Shipping core to core library	5,000
	$ 610,000
Contingency of 20%	122,000
	$ 732,000

Phase III(B) approx. 2 months

Driving Bulk Sampling Adits	
a) Main (Seam 7) 457m @ $820/m	$ 375,000
b) Seam 1 152m @ $820/m	125,000
c) Seam 4 152m @ $820/m	125,000
Diamond Drilling - 4100m @ $140/m	574,000
Bulldozing	75,000
Downhole Geophysical	70,000
Geology, Engineering & Supervision	35,000
Swampers	9,000
Camp	50,000
Travel	5,000
Data Compilation, Reports & Drafting	40,000
Shipping core to core library	10,000
Ground Sampling	10,500
Vehicles	7,000
Fuel	10,000
Backhoe	5,000
	$ 1,525,500
Contingency @ 20%	305,100
	$ 1,830,600

REFERENCES

BU Mines, Survey Revise Definitions of Mineral Terms; Geotimes, September, 1974.

Coal Task Force (1976): Coal in B.C.; A Technical Appraisal

Edwards, K.W. and Banks, K.M. 1977: A Theoretical Approach to the Evaluation of Insitu Coal; paper presented at 6th Formation Evaluation Symposium of the Canadian Well Logging Society, Calgary.

Emkay Canada Natural Resources Ltd., Scurry-Rainbow Oil Limited (1971); Elk River Coal

Gibson, D.W. (1972): Triassic Stratigraphy of the Pine Pass - Smoky River Area, Rocky Mountain Foothills and Front Ranges of B.C. and Alberta; G.S.C. Paper 71-30.

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; Liard Mining Division, Assessment Report.

Jones, H.M. (1980): Assessment Report on the Geological Mapping Program on Parts of Coal Licences 3986-3993 inclusive; Liard Mining Division.

Jones, H.M. (1981): Progress Report of work performed on Coal Licences 3986-3993 inclusive, Pine River Area, Liard Mining Division.

Keys, W.S. and MacLary, L.M. (1971): Application of Borehole Geophysics to Water-Resources Investigations. Collection of Environmental Data Book 2 U.S.G.S. Techniques of Water-Resources Investigations.

McLearn, F.H. and Kindle, E.D. (1950): Geology of Northeastern British Columbia; Geol. Surv. Can., Mem.259.

REFERENCES .. continued

McKechnie, N.D. (1955): Coal Reserves of the Hasler Creek-Pine River Area; B.C. Dept. of Mines, Bull.No.36

Marton, A.S. and Jones, H.M. (1981): Diamond Drilling and Trenching Report on Coal Licences 3986 to 3993 inclusive and 6792, Pine River Area, Liard Mining Division

Ministry of Economic Development, Province of B.C.; B.C. Coal Development

Morris, D.W. (1975): Formation Evaluation using Geophysical Drill Logs: A General Approach in Canadian Well Logging Society Journal; Vol.8, No.1 pp 8596

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, A.S. Marton, of the City of Vancouver, British Columbia, do hereby certify that:

1. I am a consulting geologist with G.A. Noel & Associates, Inc., 622-510 West Hastings Street, Vancouver, B.C.

2. I am a graduate of the University of British Columbia and have been granted the degree of Bachelor of Science in Geology.

3. I have been practising my profession as an Exploration Geologist for 9 years in British Columbia; Yukon, Alaska, Washington, Idaho and Australia.

4. This report is based on eleven months of fieldwork, which I personally supervised, on the Willow Creek Coal property, during 1980-1981.

5. I have no interest, nor do I expect to receive any interest, direct or indirect, in coal licences 3986-3993, and 6792, 7191, 7192 or in any securities of David Minerals Ltd.

6. David Minerals Ltd. is hereby given permission to reproduce this report, or any part of it, for financing purposes; 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.

A.S. MARTON, B.Sc.

Vancouver, B.C.
December 31, 1981

CERTIFICATE

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

1. I am a consulting geological engineer with G.A. Noel & Associates, Inc. 622-510 West Hastings Street, Vancouver, B.C.

2. I am a graduate of the University of British Columbia in Geological Engineering, 1956.

3. I have been practising my profession as a geological engineer for 25 years.

4. I am a member of the Association of Professional Engineers of British Columbia, Registration No.4681.

5. I am familiar with coal licences 3986-3993, 6792, 7191 and 7192 having planned and conducted reconnaissance geological mapping and trenching programs on the licences during 1979 and 1980. I also consulted on drilling programs conducted on the licences in 1980 and 1981 and reviewed all the data from this work.

6. I have no interest, nor do I expect to receive any interest, direct or indirect in coal licences 3986-3993 and 6792, 7191 and 7192 or in any securities of David Minerals Ltd.

7. David Minerals Ltd. is hereby given permission to reproduce this report, or any part of it, for financing purposes; 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 31st day of December, 1981.

Harold M. Jones

HAROLD M. JONES, P.Eng.

Local Grid Northing	Diamond Drill Hole	Geological Log Apparent Width (m)	Recovery %	Geophysical Log Apparent Width (m)	Accepted Coal Zone True Width (m)
		Z O N E S E V E N cont'd.			
6000	81-20	2.4/3.0	Not determined	2.8/3.9	2.8/3.9
	81-37	5.2/5.6	81	5.4/6.0	5.4/6.0
5800	81-18	4.8/5.2	86	4.4/4.9	4.2/4.7
	81-38	5.7/5.8	72	5.1/5.7	3.9/4.4
5600	81-5	5.0	98	4.1	4.1
	81-8	4.0	91	4.0	4.0
	81-33	6.2	98	4.4	4.4
5400	81-4	5.0	94	4.2	4.2
	81-7	4.4	86	A. 0.9	A. 0.9
				B. 4.3	B. 4.3
	81-16	5.5/6.0	86	5.3/5.8	4.3
	81-31	4.8/5.0	89	4.1/4.9	4.1/4.9
5200	81-13	4.9/5.5	100	4.5/5.3	4.5/5.3
	81-14	5.5	83	11.1	6.5/7.8
	81-29	4.9	100	4.6/4.9	4.6/4.9
	81-36	5.6/6.1	98	4.7/5.1	4.7/5.1
5000	80-1	4.9	73	5.6	5.6
	80-2	4.2	89	A. 1.0	A. 1.0
				B. 5.5	B. 5.5
	80-3	5.1	99	A. 0.5	A. 0.5
				B. 4.4	B. 4.4
	81-19	5.4/5.5	100	5.4	5.0/5.4
4800	81-6	5.5	93	A. 1.0	A. 1.0
				B. 4.8	B. 4.9
	81-25	3.3/3.8	100	4.4/5.0	4.4/5.0
	81-40	A. No recovery	94	A. 2.0	A. 1.9
		B. 6.6/7.4		B. 6.0/7.4	B. 5.5/6.5
4600	81-15	4.7/6.7	96	4.6/5.6	4.6/5.6
	81-22	A. 1.5	99	A. 2.4	A. 2.4
		B. 1.2		B. 1.3	B. 1.3
	81-42	6.7/8.1	91	6.8/8.2	6.6/7.9
4400	81-9	3.95	85	3.2	3.2
	81-44	7.3/8.8	72	5.8	5.8
4200	81-17	A. 4.7	91	A. 3.5	A. 3.5
		B. 1.2		B. 1.2	B. 1.2
	81-46	15.8	76	16.5	5.6
4000	81-10	5.0	85	A. 2.3	A. 2.3
				B. 0.9	B. 0.9

TABLE 5 .. continued

Local Grid Northing	Diamond Drill Hole	Geological Log Apparent Width (m)	Recovery %	Geophysical Log Apparent Width (m)	Accepted Coal Zone True Width (m)
			Z O N E "A"		
7000	81-30	1.3	100	1.4	1.4
6800	81-27	1.5	100	1.2	1.2
6600	81-28	1.2	82	1.5	1.4
6400	81-23	2.3	69	2.3	2.0

TABLE 6a

SUMMARY OF COAL QUALITY

Location Local Grid Northing	Diamond Drill Hole	Sample No.	Geological Interval (m)	Apparent Width (m)	Ash	Volatile Matter	Fixed Carbon	Sulphur	F.S.I.	B.T.U./lb Moist/or As received	B.T.U./lb (Dry)	Analysis Report Number
					(Dry Basis Values) %							
					SEAM ONE							
7000	81-30 A	476	28.7 - 29.6	2.6	8.52	24.3	67.18	1.0	5.5	13,578	14,047	22516
			30.6 - 31.3	Not sampled								
	B	477	33.1 - 34.8	1.7	9.24	22.69	68.07	0.53	8.0	13,286	14,070	22516
6800	81-27 A	58830	56.85- 57.7	2.45	11.15	24.44	64.41	0.66	5.0	12,986	13,440	22454
		58831	58.1 - 58.45		15.99	22.2	61.81	0.65	8.5	12,383	12,751	22454
		58832	58.6 - 59.3		7.19	22.23	70.58	0.65	7.0	14,045	14,422	22454
	B	58833	61.5 - 62.2	1.7	2.8	20.91	76.29	0.48	2.0	14,656	15,081	22454
		58834	62.2 - 63.2		2.19	27.42	70.39	0.52	9.0	14,946	15,331	22454
6600	82-28 A	58774	53.8 - 54.8	1.9	3.5	22.72	73.78	0.63	7.0	14,379	14,998	22454
		58775	55.1 - 55.7		14.46	20.28	65.26	0.43	3.0	12,618	13,018	22454
	B	58776	56.4 - 58.4	2.0	14.8	21.84	63.36	0.42	1.0	12,727	13,190	22454
6400	81-23 A	58780	37.4 - 38.4	1.0	4.19	23.68	72.13	0.69	8.0	14,387	14,911	22386
	B	58781	38.9 - 40.2	2.8	9.18	20.58	70.24	0.46	1.5	13,455	14,073	22386
		58782	40.2 - 41.7		3.24	24.22	72.54	0.44	5.0	14,760	15,141	22386
6200	81-21 A	58762	40.3 - 41.3	1.0	9.1	23.35	67.55	0.65	7.5	13,760	14,035	22386
	B	58763	41.9 - 44.6	2.7	10.91	20.61	68.48	0.82	1.5	13,301	13,604	22386
6000	81-20		23.4 - 23.8	Not sampled								
			25.0 - 26.3	Not sampled								
		58732	26.5 - 28.0	4.0	5.42	21.17	73.41	0.34	1.5	13,974	14,469	22454
		58733	28.0 - 29.5		4.92	25.09	69.99	0.31	8.5	14,441	14,726	22454
		58734	29.5 - 30.5		2.65	27.06	70.29	0.41	8.5	14,875	15,150	22454
5800	81-18	58701	19.2 - 20.65	1.25	3.26	22.06	74.68	0.52	3.5	14,794	15,063	22269
5600	*81-5	97871	7.5 - 8.5	1.0	20.09	22.95	56.96	0.66	1.5	11,240	11,830	64-22010
	81-33 A	3550	(43.4 - 44.0) (44.4 - 44.7)	1.3	17.96	25.83	56.21	0.72	8.0	12,106	12,534	22531
	B	3551	48.0 - 49.1	2.8	5.63	21.46	72.91	0.36	2.5	13,838	14,498	22531
		3552	49.1 - 50.1		1.57	22.93	75.5	0.54	3.0	14,562	15,297	22531
		3553	50.1 - 50.8		4.39	26.76	68.85	0.38	9.0	14,029	14,803	22555
5400	*81-4	97851	30.4 - 31.1	2.3	3.5	21.3	75.2	0.56	2.0	14,440	14,894	64-19955
		97852	31.1 - 32.7		3.18	24.39	72.43	0.53	6.0	14,429	14,921	64-19956
	81-31	490	85.4 - 88.3	2.9 *	6.85	22.93	70.22	0.46	4.5	13,576	14,338	22516
5200	81-13	56401	66.7 - 67.7	2.5	6.47	38.85	54.68	0.45	1.0	14,083	14,595	22120
		56402	67.7 - 69.2		2.2	44.35	53.45	0.48	8.0	14,877	15,243	22120
	81-29	58751	180.3 -181.7	2.9	5.6	20.56	73.84	0.37	1.5	14,040	14,571	22454
		58752	181.7 -183.2		8.42	24.89	66.69	0.42	8.5	13,451	14,110	22454
5000	*80-3	438	71.6 - 72.2	2.25	19.29	27.21	53.5	0.42	1.5	11,105	11,625	64-19912
		439	72.2 - 73.85		2.5	21.14	76.36	0.31	1.0	14,413	15,083	64-19913
	*81-11	97644	13.1 - 14.3	3.1	7.11	21.42	71.47	0.44	1.0	13,466	14,102	64-20128
		97645	14.3 - 16.2		12.38	21.54	66.08	0.43	2.0	12,838	13,660	64-20129
	81-19	58714	196.0 -197.0	2.3	8.14	21.38	70.48	0.38	1.5	13,589	13,888	22336
		58715	197.0 -198.3		5.77	22.45	71.78	0.37	5.0	14,245	14,570	22336
4800	*81-6	97887	55.45- 57.0	2.9	2.08	21.83	76.09	0.44	1.5	14,516	15,089	64-20045
		97888	57.0 - 58.35		25.41	21.18	53.41	0.51	8.0	10,832	11,125	64-20046
	81-25	58803	211.8 -213.2	2.8	13.41	23.79	62.80	0.34	1.0	12,592	12,975	22454
		58804	213.2 -214.6		1.35	26.55	72.10	0.39	9.0	15,038	15,406	22454
4600	81-15	58853	51.7 - 53.0	2.5	7.4	21.34	71.26	0.37	1.0	13,698	14,066	22454
		58854	53.0 - 54.2		0.98	24.88	74.14	0.38	8.5	15,183	15,465	22454
	81-22		216.7 -217.7	Not sampled								
4400	*81-9	97619	38.1 - 41.3	3.2	6.55	22.36	71.09	0.44	3.0	13,794	14,357	64-20097
4200	81-17	59508	96.2 - 97.7	3.0	7.06	21.54	71.4	0.47	1.5	13,919	14,194	22269
		59509	97.7 - 99.2		19.53	17.53	62.54	0.54	2.0	12,117	12,308	22269
4000	*81-10	97627	54.8 - 57.0	3.45	7.26	22.3	70.44	0.47	2.5	13,544	14,281	64-20111
		97628	57.0 - 58.25		6.39	26.21	67.4	0.5	9.0	13,758	14,636	64-20112
			Average:		7.9	23.72	68.32	0.50	4.5	13,680	14,166	

* Phase I Drill Holes

A: Part A of seams

B: Part B of seams

Only samples greater than 8,000 B.T.U. (Moist) tabulated

Location Local Grid Northing	Diamond Drill Hole	Sample No.	Geological Interval (m)	Apparent Width (m)	Ash	Volatile Matter	Fixed Carbon	Sulphur	F.S.I.	B.T.U./lb Moist/or As received	B.T.U./lb (Dry)	Analysis Report Number
					(Dry Basis Values) %							
					SEAM TWO							
5600	*81-5	97872	21.9 - 22.9	1.0	16.57	20.92	62.51	0.56	4.5	12,168	12,498	64-20011
	81-33 A	3554	56.5 - 57.3	0.8	20.78	22.48	56.74	0.44	8.0	11,678	12,315	22531
	B	3555	58.5 - 59.5	1.0	6.54	22.24	71.22	0.55	7.5	13,932	14,505	22531
5400	*81-4 A	97853	49.05- 50.1	1.05	19.2	21.91	58.89	0.63	7.5	12,015	12,420	64-19957
	B	97854	51.0 - 51.55	0.9	6.83	20.61	72.56	0.62	1.5	14,060	14,413	64-19958
		97855	51.75- 52.1		7.66	24.57	67.77	0.76	7.5	14,214	14,506	64-19959
	81-31 A	491	99.2 -100.2	1.0	19.23	20.04	60.73	0.62	7.5	11,832	12,417	22516
	B	492	100.8 -102.0	1.2	6.81	11.83	81.36	0.68	8.0	13,773	14,377	22516
5200	81-13 A	56403	89.2 - 90.2	1.0	12.47	40.55	46.98	0.65	7.5	13,264	13,550	22120
	B	56404	90.8 - 91.2	0.9	5.95	48.82	45.23	0.54	2.5	14,309	14,612	22120
		56405	91.3 - 91.7		5.56	24.18	70.26	0.6	9.0	14,568	14,812	22120
	81-29 A	58753	199.4 -200.1	0.7	7.48	21.42	71.1	0.73	7.5	13,975	14,390	22454
	B	58754	200.8 -201.25	1.0	7.46	20.06	72.48	0.58	4.0	13,880	14,315	22454
		58755	201.4 -201.8		3.59	25.21	71.2	0.69	9.0	14,728	15,135	22454
5000	*81-11	97646	34.1 - 35.5	2.8	17.55	20.02	62.43	0.72	2.5	12,292	12,847	64-20130
		97647	35.7 - 36.9		15.12	21.23	63.65	0.5	3.5	13,285	13,853	64-20131
	81-19 A	58716	213.7 -215.1	1.4	20.64	21.13	58.23	0.63	7.0	12,013	12,172	22336
	B	58717	215.2 -215.6	0.4	25.15	18.39	56.46	0.7	1.0	11,106	11,237	22336
4800	81-25	58805	224.5 -226.4	2.2	25.66	20.15	54.19	0.46	6.5	10,868	11,235	22454
4600	81-15	58855	64.0 - 65.4	2.0	29.2	18.03	52.77	0.62	2.5	10,297	10,427	22454
		58856	65.5 - 66.0		6.96	23.86	69.18	0.47	9.0	14,431	14,606	22454
	81-22	455	241.6 -242.8	1.2	10.09	22.48	67.43	0.66	8.5	13,746	13,981	22454
4400	*81-9	97620	48.9 - 50.9	1.0	27.79	20.51	51.7	0.41	2.5	10,669	10,886	64-20098
4200	81-17 A	59510	109.1 -110.0	0.9	12.26	25.04	62.7	0.4	8.0	13,364	13,573	22269
	B	59511	110.3 -110.8	0.5	25.82	19.10	54.00	0.42	2.0	10,780	10,964	22269
			Average:		14.49	22.99	62.47	0.59	5.8	12,850	13,202	
					SEAM THREE							
6800	81-27	58842	81.45- 82.45	1.0	9.83	19.18	70.99	0.62	3.0	13,696	14,005	22454
5400	81-31	493	112.3- 114.5	2.2	5.13	21.21	73.66	0.59	3.0	14,080	14,661	22516
5200	81-29	58756	210.1- 211.1	2.0	4.04	19.19	76.77	0.49	2.0	14,149	14,891	22454
		58757	211.1- 212.1	1.0	5.02	20.9	74.08	0.44	4.0	13,672	14,236	22454
5000	*80-3	440	98.4 -100.25	1.85	5.17	19.74	75.09	0.44	1.5	13,941	14,454	64-19914
	*81-11	97649	41.75- 43.9	2.15	13.29	25.56	61.15	0.47	2.0	12,527	13,358	64-20133
	81-19	58719	224.3 -226.0	1.7	5.48	20.88	73.64	0.44	1.5	14,220	14,543	22336
4800	*81-6	97890	87.4 - 88.9	2.6	6.48	20.57	72.95	0.35	1.0	13,795	14,291	64-20048
		97891	88.9 - 90.0		7.85	23.92	68.23	0.39	1.0	13,350	13,887	64-20049
	81-25	58806	233.5 -235.6	2.1	10.45	22.44	67.11	0.37	1.0	13,215	13,655	22454
4600	81-15	58857	71.9 - 73.7	1.8	11.79	19.70	68.51	0.36	1.5	12,632	12,912	22454
	81-22	456	248.9 -250.2	2.4	5.31	18.27	76.42	0.39	1.0	14,076	14,520	22454
		459	250.2 -251.3		8.49	21.09	70.42	0.36	1.5	13,629	14,038	22454
4400	*81-9	97621	57.8 - 59.85	1.1	11.98	24.26	63.76	0.47	1.5	12,763	13,114	64-20099
4200	81-17	59512	116.1 -117.3	2.3	10.35	20.01	69.64	0.41	1.0	13,386	13,654	22269
		59513	117.3 -118.4		7.4	22.55	70.05	0.44	2.0	13,853	14,127	22269
4000	*81-10	97630	73.8 - 75.3	4.5	18.01	19.39	62.6	0.4	1.0	11,309	12,451	64-20114
		97631	75.3 - 76.8		9.61	24.22	66.17	0.41	1.5	12,798	13,666	64-20115
		97632	76.8 - 78.3		9.79	17.45	72.76	0.41	1.5	12,310	13,859	64-20116
			Average:		8.71	21.08	70.21	0.43	1.71	13,337	13,912	

Location Local Grid Northing	Diamond Drill Hole	Sample No.	Geological Interval (m)	Apparent Width (m)	Ash (Dry Basis)	Volatile Matter (Dry Basis)	Fixed Carbon (Dry Basis)	Sulphur (Dry Basis) %	F.S.I.	B.T.U./lb Moist/or As received	B.T.U./lb (Dry)	Analysis Report Number
					SEAM FOUR							
7000	81-30 A	479	88.2 - 89.6	1.4	5.21	19.07	75.72	0.48	1.5	14,219	14,648	22516
	B	480	90.6 - 92.6	2.0	11.84	20.37	67.79	0.37	1.5	12,606	13,416	22516
	C	481	93.9 - 95.4	1.5	18.34	22.00	59.66	0.43	3.0	12,002	12,324	22516
6800	81-27 A	58835	109.9 -110.1	1.8	12.06	22.31	65.63	0.68	9.0	13,067	13,592	22454
		58836	110.2 -111.1		7.22	19.14	73.64	0.47	1.5	14,065	14,468	22454
		58837	111.1 -111.7		9.87	21.75	68.38	0.49	8.0	13,822	14,191	22454
	B	58838	112.75-113.85	2.05	1.88	21.98	76.14	0.39	6.5	14,899	15,319	22454
		58839	113.85-114.8		11.11	20.58	68.31	0.39	4.5	13,152	13,907	22454
	C	58840	116.05-116.75	1.7	6.7	20.82	72.48	0.5	7.0	14,146	14,490	22454
		58841	117.25-117.75		7.87	24.0	68.13	0.67	9.0	13,683	14,406	22454
6600	81-28 A	58777	109.8 -110.8	1.5	22.03	16.16	61.81	0.42	8.0	11,411	11,801	22454
			110.8 -111.3	Not sampled								
	B	58778	112.9 -115.2	2.3	2.04	20.1	77.86	0.44	2.5	14,361	15,260	22454
	C	58779	116.5 -118.0	1.5	5.3	21.15	73.55	0.55	4.5	14,187	14,724	22454
6400	81-23 A		96.0 - 96.8	Not sampled								
		58783	97.6 - 98.7	2.7	7.67	21.51	70.82	0.54	2.5	13,797	14,180	22386
	B	58784	103.4 -104.6	4.3	8.02	20.19	71.79	0.54	5.0	13,840	14,336	22386
		58785	104.6 -105.8		1.97	21.19	76.84	0.65	4.0	14,922	15,298	22386
		58786	106.3 -107.0		6.35	19.81	73.84	0.58	3.5	14,130	14,548	22386
		58787	107.3 -107.7		2.94	24.48	72.58	0.72	9.0	14,832	15,206	22386
	81-32		4.7 - 5.7	Not sampled								
6200	81-21	58765	104.2 -106.7	6.6	6.67	19.87	73.46	0.48	2.0	14,124	14,461	22386
		58766	106.7 -110.0		10.53	20.17	69.3	0.42	4.5	13,524	13,872	22386
		58767	110.2 -110.8		10.31	20.22	69.47	0.54	7.5	13,661	14,023	22386
	81-34	64676	3.5 - 4.2	0.7	21.6	23.3	55.1	0.44	-	10,065	10,861	22531
6000	81-20	58735	93.4 - 94.7	1.3	35.32	18.48	46.20	0.24	1.0	9,145	9,410	22454
	81-35	64683	49.4 - 50.9	2.9	3.16	19.42	77.42	0.39	1.5	14,316	15,081	22598
		64684	50.9 - 52.5		3.77	20.66	75.57	0.4	1.5	14,131	14,984	22598
	81-37 A		46.0 - 47.2	Not sampled								
	B	64701	48.5 - 50.7		7.26	19.49	73.25	0.38	1.0	12,862	14,315	22598
		64702	50.7 - 54.1		9.84	19.18	70.98	0.37	1.5	13,082	13,853	22598
5800	81-18	58704	73.5 - 76.8	4.8	7.75	19.49	72.76	0.34	1.0	13,919	14,278	22269
		58705	76.8 - 78.3		2.59	21.51	75.9	0.35	3.5	14,672	15,035	22269
	81-38	64708	64.3 - 66.6	2.3	7.11	19.49	73.4	0.41	1.0	13,248	14,279	22636
5600	*81-5 A	97874	71.6 - 73.8	3.4	2.1	19.54	78.36	0.46	1.5	14,560	15,116	64-20013
		97875	73.8 - 75.0		3.33	23.61	73.06	0.41	6.0	14,493	14,989	64-20014
	B	97876	77.3 - 80.3	3.0	4.15	22.70	73.15	0.43	6.5	14,037	14,756	64-20015
	81-33		98.3 - 98.6	Not sampled								
		3558	99.0 -100.0	3.8	7.31	19.68	73.01	0.53	2.0	13,161	13,923	22555
		3559	100.0 -102.1		9.61	19.11	71.28	0.38	1.5	12,474	13,803	22555
5400	*81-4	97857	94.75- 96.6	3.85	4.7	19.54	75.76	0.4	1.5	13,807	14,745	64-19961
		97858	96.6 - 98.6		13.87	20.73	65.4	0.48	5.0	12,545	13,261	64-19962
	81-31	494	136.9 -139.0	2.9	5.65	19.37	74.98	0.4	1.5	13,607	14,503	22516
		495	139.0 -139.8		20.74	9.76	69.5	0.42	2.5	10,806	12,139	22516
5200	81-13	56410	127.0 -128.3	4.4	9.05	19.28	71.67	0.45	1.5	13,552	13,996	22120
		56411	128.3 -130.3		16.36	19.64	64.0	0.41	1.0	12,044	12,710	22120
		56412	131.2 -131.4		30.98	17.95	51.07	0.7	5.0	10,251	10,483	22120
	81-29	58758	234.6 -236.5	4.2	1.95	18.76	79.29	0.58	1.5	14,420	15,066	22516
		58759	236.8 -238.8		13.39	18.89	67.72	0.41	2.5	12,156	12,750	22516
	81-36	64685	29.2 - 32.05	2.85	35.26	15.89	48.85	0.43	1.0	8,769	9,704	22598
	81-39	64697	29.6- 32.8	3.2	11.34	19.49	69.17	0.54	1.0	12,102	13,543	22636
5000	*80-3	441	122.3 -126.3	4.0	13.27	20.16	66.57	0.46	1.0	12,383	13,207	64-19915
	*81-11	97650	69.2 - 70.7	4.0	3.18	20.23	76.59	0.48	1.0	13,998	15,027	64-20134
		97651	70.7 - 73.2		4.6	20.56	74.84	0.55	3.0	14,075	14,807	64-20135
	*81-12	97653	21.6 - 23.5	1.9	14.38	19.93	65.69	0.59	1.0	12,357	12,754	64-20137
	81-19	58720	250.1 -250.8	3.8	3.99	18.11	77.9	0.56	1.5	14,573	14,869	22336
		58721	250.8 -251.7		5.14	19.22	75.64	0.49	1.0	14,363	14,662	22336
		58722	251.7 -253.9		18.81	19.44	61.75	0.42	1.5	12,059	12,300	22336
4800	*81-6	97893	128.4 -130.8	3.7	4.47	20.35	75.18	0.54	1.0	14,214	14,837	64-20051
		97894	130.8 -132.1		2.2	20.8	77.0	0.58	2.0	14,674	15,101	64-20052
	81-25	58807	257.8 -259.5	3.0	4.47	18.85	76.78	0.47	1.0	14,041	14,710	22454
		58808	259.5 -260.8		14.54	20.67	64.79	0.39	1.5	12,507	13,065	22454
4600	81-15	58858	99.3 -100.3	1.9	7.02	21.70	71.28	0.46	1.5	13,890	14,114	22454
		58859	100.3 -101.2		10.42	19.9	69.68	0.45	3.0	13,596	13,842	22454
	81-22	457	273.3 -274.5	2.4	3.68	18.29	78.03	0.58	1.0	14,615	14,979	22454
		458	274.5 -275.7		4.38	18.93	76.69	0.42	1.0	14,455	14,842	22454
4400	*81-9		84.4 - 86.1	1.5	Not sampled							
4200	81-17	59514	139.8 -140.2	3.0	32.85	16.04	51.11	0.52	1.0	9,962	10,157	22269
		59515	140.6 -142.3		15.81	20.34	63.85	0.52	1.0	12,266	12,795	22269
4000	*81-10	97633	98.5 -100.0	1.5	9.11	21.88	69.01	0.59	7.5	12,892	13,545	64-20117
			Average:		10.10	19.96	70.10	0.48	2.96	13,244	13,839	

Location Local Grid Northing	Diamond Drill Hole	Sample No.	Geological Interval (m)	Apparent Width (m)	Ash	Volatile Matter	Fixed Carbon	Sulphur	F.S.I.	B.T.U./lb Moist/or As received	B.T.U./lb (Dry)	Analysis Report Number
					(Dry Basis Values) %							
					SEAM FIVE							
7000	81-30	484	167.85-168.9	1.05	4.24	17.94	77.82	0.76	1.5	14,240	14,702	22516
6800	81-26		74.9 - 76.0	1.1	Not sampled							
	81-27	58844	192.2 -193.1	0.9	5.65	18.25	76.10	0.67	1.5	14,010	14,405	22454
6400	81-32	351	92.5 - 93.6	1.1	3.42	16.8	79.78	0.67	2.0	14,288	14,939	22531
6200	81-34	64677	105.8 -106.8	2.15	13.85	15.57	70.58	0.64	1.0	12,602	13,149	22555
		64678	107.3 -107.95		3.3	17.36	79.34	0.82	1.5	14,143	14,995	22555
6000	81-37	64703	143.0 -145.3	2.3	8.95	16.22	74.83	0.76	1.5	12,742	14,146	22598
5800	81-18	58707	164.5 -165.8	2.2	5.68	16.42	77.9	0.68	2.0	14,374	14,632	22269
		58708	166.1 -166.7		10.9	15.95	73.15	0.7	1.5	13,355	13,451	22269
5600	*81-5 A	97878	168.9 -170.6	1.7	17.23	15.72	67.05	0.67	1.0	12,450	12,790	64-20017
	B	97879	171.4 -172.2	0.8	5.29	17.19	77.52	0.91	1.0	14,271	14,666	64-20018
	81-33 A	3561	199.2 -200.4	1.2	3.19	17.45	79.36	0.7	1.5	14,303	15,046	22555
	B		201.2 -201.7	0.5	Not sampled							
5400	*81-4	97862	192.2 -193.4	2.2	3.53	17.95	78.52	0.73	1.0	14,666	15,027	64-19966
		97863	193.9 -194.4		12.89	17.05	70.06	0.75	1.5	13,134	13,482	64-19967
	*81-7 A	97601	12.4 - 12.95	0.55	5.56	16.94	77.5	0.81	1.5	14,010	14,490	64-20064
	B	97602	13.6 - 14.4	0.8	7.05	16.08	76.87	0.77	1.0	13,910	14,406	64-20065
	81-16 A	59495	127.1 -128.1	1.0	16.44	14.03	69.53	0.6	-	12,836	12,931	22269
	B	59496	128.6 -129.5	0.9	11.76	14.37	73.87	1.07	-	13,476	13,671	22269
5200	81-13 A	56414	241.9 -242.6	1.7	2.65	17.24	80.11	0.75	1.5	14,795	15,165	22120
		56415	242.6 -243.6		7.05	16.09	76.86	0.65	0.5	13,987	14,426	22120
	B	56417	248.4 -249.2	1.9	5.54	16.29	78.17	0.7	1.5	14,405	14,681	22120
		56418	249.4 -250.3		6.77	17.34	75.89	0.87	1.5	14,235	14,491	22120
	81-14	59476	118.5 -121.0	4.0	16.05	15.12	68.83	0.6	0.5	12,504	12,902	22120
		59477	121.2 -122.5		11.08	16.24	72.68	0.81	1.0	13,385	13,736	22120
	81-29 A		329.8 -330.3	0.5	Not sampled							
	B	58761	331.0 -331.9	0.9	4.77	16.71	78.52	0.73	1.5	14,267	14,735	22516
	81-36	64686	124.95-126.3	2.25	3.35	16.85	79.8	0.65	1.0	14,474	15,122	22598
		64687	126.6 -127.2		3.93	15.99	80.08	0.7	1.0	14,497	15,048	22598
5000	*80-2	417	43.0 - 43.55	2.2	2.42	16.35	81.23	0.62	1.0	14,285	15,086	64-19891
		418	43.55- 43.8		13.38	15.72	70.9	0.56	1.0	13,215	13,789	64-19892
		419	43.8 - 44.1		5.65	18.64	75.71	0.68	3.0	14,260	14,653	64-19893
		421	44.3 - 45.2		4.66	16.25	79.09	0.62	1.0	13,902	14,843	64-19895
	*80-3	443	248.0 -249.0	1.9	11.46	17.28	71.26	0.64	1.0	12,973	13,603	64-19917
		444	249.0 -249.9		10.48	18.01	71.51	0.7	1.0	13,953	14,390	64-19918
4800	*81-6	97896	238.4 -240.1	1.7	4.14	17.53	78.33	0.65	1.0	14,325	14,817	64-20054
4600	81-15	58862	229.5 -229.9	2.1	11.09	19.91	69.00	0.78	3.0	13,435	13,623	22454
		58863	230.0 -231.6		3.12	17.74	79.14	0.65	1.5	14,652	14,902	22454
	81-22 A	451	382.6 -383.6	1.0	7.82	15.28	76.9	0.66	1.0	13,922	14,253	22454
	B		387.7 -388.2	0.5	Not sampled							
	81-42	64723	33.9 - 35.7	1.8	8.13	18.05	73.82	0.56	1.5	13,234	14,032	22677
4400	*81-9	97622	209.5 -210.2	0.7	13.05	16.78	70.17	0.76	1.0	12,729	13,351	64-20100
	81-44	64754	86.0 - 87.2	1.2	11.15	17.83	71.02	0.54	1.0	13,250	13,893	22710
4200	81-17 A	59520	235.2 -236.1	0.9	5.07	18.09	76.84	0.72	1.0	14,368	14,754	22269
	B	59521	237.8 -238.4	0.6	5.61	18.14	76.25	0.85	1.5	14,317	14,664	22269
	81-46 A	64765	45.7 - 46.9	1.2	8.33	17.90	73.77	0.7	1.5	13,350	13,941	22710
	B	64766	48.8 - 49.8	1.0	19.58	18.75	61.67	0.68	1.5	11,670	12,172	22710
4000	81-10	97637	210.0 -211.2	4.3	3.04	17.31	79.65	0.64	1.0	14,395	15,048	64-20121
		97638	211.2 -213.1		25.87	15.15	58.98	0.47	1.0	10,754	11,103	64-20122
		97639	213.1 -214.3		8.1	17.75	74.15	0.61	1.0	14,860	15,770	64-20123
			Average:		8.31	16.91	74.79	0.7	1.23	13,722	14,216	

Location Local grid Northing	Diamond Drill Hole	Sample No.	Geological Interval (m)	Apparent Width (m)	Ash (Dry Basis Value) %	Volatile Matter (Dry Basis Value) %	Fixed Carbon (Dry Basis Value) %	Sulphur (Dry Basis Value) %	F.S.I.	B.T.U./lb Moist/or As received	B.T.U./lb (Dry)	Analysis Report Number
					SEAM SIX							
7200	81-41	64719	79.9 - 82.5	2.6	9.51	18.23	72.26	0.88	1.5	12,714	13,833	22677
6800	81-27		205.9 -206.7	0.8	Not sampled							
6600	81-24	58798	108.4 -110.3	1.9	11.79	16.17	72.04	0.84	0.5	13,192	13,609	22425
6400	81-23	58791	217.4 -218.4	1.0	3.83	17.55	78.62	0.75	2.0	14,563	14,900	22425
	81-32	352	108.1 -109.1	1.0	6.94	16.03	77.03	0.68	2.0	13,646	14,340	22531
6200	81-34	64679	131.3 -132.0	0.7	2.95	16.46	80.59	0.74	1.5	13,424	15,037	22555
6000	81-20	58739	198.6 -199.6	1.0	24.07	14.39	61.54	0.51	1.5	11,342	11,543	22454
	81-37	64704	164.2 -166.7	2.5	15.08	14.72	70.2	0.57	1.0	12,359	12,888	22636
5800	81-18	58709	202.1 -203.3	3.2	4.33	15.74	79.93	0.61	0.5	14,417	14,767	22269
		58710	203.9 -205.3		10.23	16.11	73.66	0.67	1.5	13,413	13,793	22269
	81-38	64711	165.0 -166.7	1.7	10.69	17.11	72.2	0.7	1.0	13,355	13,757	22636
			167.3 -167.7	0.4	Not sampled							
5600	*81-5	97880	193.2 -194.1	3.45	3.52	15.48	81.0	0.63	0.5	14,334	14,786	64-20019
		97881	194.1 -196.65		37.85	15.03	47.12	0.59	1.0	10,849	11,089	64-20020
	*81-8	97611	28.6 - 29.6	3.1	2.58	15.24	82.18	0.57	-	14,314	15,060	64-20089
		97612	29.6 - 31.1		8.12	15.34	76.56	0.5	-	13,039	13,775	64-20090
		97613	31.1 - 31.7		4.68	18.04	77.28	0.6	-	13,833	14,491	64-20091
	81-33	3562	222.75-224.0	2.75	3.64	14.79	81.57	0.63	0.5	14,268	14,909	22555
		3563	224.3 -225.5		15.26	18.87	65.86	0.66	1.5	11,963	12,634	22555
5400	*81-4	97864	217.85-218.5	2.45	2.3	16.47	81.23	0.71	-	14,680	15,104	64-19968
		97865	218.5 -220.3		3.49	18.27	78.24	0.64	1.0	14,368	14,752	64-19969
	*81-7	97603	38.1 - 39.9	3.0	3.75	15.85	80.4	0.55	1.5	14,339	14,957	64-20066
		97604	39.9 - 41.1		4.03	16.07	79.9	0.67	1.0	14,386	14,975	64-20067
	81-16	59498	155.5 -156.6	3.5	4.09	14.58	81.33	0.66	0.5	14,329	14,804	22269
		59499	156.6 -157.8		2.92	13.92	83.16	0.55	0.5	14,551	15,082	22269
		59500	157.8 -159.0		12.39	17.49	70.12	0.6	1.0	13,070	13,444	22269
	81-31	496	252.5 -254.4	1.9	11.01	14.91	74.08	0.46	0.5	13,246	14,011	22516
5200	81-13	56421	267.7 -269.0	2.6	3.28	15.1	81.62	0.57	-	14,597	14,968	22120
		56422	269.0 -270.3		6.12	16.42	77.46	0.6	1.5	14,283	14,639	22120
	81-14	59479	144.2 -145.4	3.8	20.72	15.6	63.68	0.74	-	12,012	12,231	22120
		59480	145.4 -146.6		2.61	14.98	82.41	0.58	1.0	14,585	15,064	22120
		59481	146.6 -148.0		4.91	16.36	78.73	0.55	-	14,436	14,818	22120
	81-29	58742	353.2 -354.0	2.2	6.49	15.56	77.95	0.6	1.5	13,830	14,415	22516
		58743	354.0 -355.4		7.29	15.89	76.82	0.66	2.0	13,482	14,409	22516
	81-36	64688	145.4 -146.7	2.85	3.00	15.26	81.74	0.56	-	14,391	14,964	22598
		64689	146.7 -148.25		4.27	16.52	79.21	0.59	1.0	14,022	14,907	22598
5000	*80-1	404	25.0 - 27.4	2.4	4.1	15.61	80.29	0.54	0.5	14,601	14,863	64-19878
	*80-2	424	61.0 - 62.3	3.2	2.44	16.41	81.15	0.54	0.5	14,411	15,008	64-19898
		425	62.3 - 63.9		1.7	16.67	81.63	0.57	1.0	14,573	15,239	64-19899
		426	63.9 - 64.2		15.23	16.47	68.3	0.56	2.0	13,042	13,311	64-19900
	*80-3	446	268.8 -269.1	3.5	12.41	15.03	72.56	0.61	-	12,879	13,360	64-19920
		447	269.1 -270.4		1.91	15.68	82.41	0.58	-	14,547	15,166	64-19921
		448	270.4 -270.7		2.63	16.43	80.94	0.57	-	14,424	15,036	64-19922
		449	270.7 -272.3		2.15	16.61	81.24	0.66	1.0	14,368	15,191	64-19923
	81-19	58725	370.0 -371.0	2.6	7.64	16.01	76.35	0.59	1.5	13,943	14,260	22336
		58726	371.0 -372.6		5.95	16.72	77.33	0.69	1.5	14,264	14,516	22336
4800	*81-6	97898	255.7 -256.6	2.5	3.08	16.43	80.49	0.6	-	14,538	15,050	64-20056
		97899	256.6 -258.2		2.17	17.29	80.54	0.67	1.0	14,790	15,247	64-22057
	81-25	58810	385.0 -386.0	2.0	6.75	15.88	77.37	0.58	1.5	14,070	14,445	22454
		58811	386.0 -387.0		3.71	16.09	80.2	0.59	1.5	14,533	14,997	22454
	81-40	64698	12.1 - 14.0	4.7	2.68	15.19	82.13	0.55	-	14,123	14,979	22636
		64699	14.0 - 16.8		5.00	15.97	79.03	0.71	1.0	13,667	14,745	22636
4600	81-15	58865	245.5 -247.2	1.7	5.57	15.59	78.84	0.47	1.5	14,263	14,508	22454
	81-22	452	406.9 -408.5	1.6	14.09	14.32	71.59	0.67	0.66	13,014	13,327	22454
	81-42	64724	50.4 - 51.8	2.6	2.85	15.65	81.5	0.56	1.0	14,067	14,752	22677
		64725	51.8 - 53.0		4.04	15.37	80.59	0.55	1.0	14,068	14,640	22677
4400	*81-9	97623	220.7 -222.5	1.8	16.92	24.21	58.87	0.53	1.0	11,435	12,555	64-20101
	81-44	64755	102.3 -103.3	2.6	18.76	16.38	64.86	0.51	1.5	11,860	12,322	22710
		64756	103.3 -104.9		5.07	16.96	77.97	0.55	1.5	14,156	14,666	22710
4200	81-17	59522	252.3 -253.7	1.4	5.46	15.44	79.1	0.56	-	14,189	14,592	22269
	81-46	64767	66.0 - 68.9	5.0	4.68	18.39	76.93	1.09	1.0	14,029	14,847	22744
		64768	68.9 - 71.0		2.42	17.65	79.93	0.87	1.5	14,351	15,106	22744
4000	*81-10	97640	229.0 -231.2	2.2	7.03	20.54	72.43	0.63	1.0	13,664	14,224	64-20124
			Average:		7.28	16.29	76.42	0.62	0.89	13,762	14,323	

Location Local Grid Northing	Diamond Drill Hole	Sample No.	Geological Interval (m)	Apparent Width (m)	Ash (Dry Basis) %	Volatile Matter (Dry Basis) %	Fixed Carbon (Dry Basis) %	Sulphur (Dry Basis) %	F.S.I.	B.T.U./lb Moist/or As received	B.T.U./lb (Dry)	Analysis Report Number
					SEAM SEVEN							
7400	81-45 A	64763	139.8 -140.65	0.85	7.52	15.48	77.0	0.72	1.0	13,264	14,246	22744
	B	64764	142.0 -144.3	2.3	8.19	16.93	74.88	0.85	1.5	13,384	14,235	22710
7200	81-41 A	64721	119.1 -120.2	1.1	6.83	15.62	77.55	0.7	1.0	13,571	14,360	22677
	B	64722	120.8 -122.8	2.0	6.48	17.6	75.92	0.87	1.5	13,396	14,360	22677
7000	81-30 A	487	234.9 -236.2	1.3	10.1	15.68	74.31	0.54	1.5	13,487	14,022	22516
	B	488	238.1 -239.2	1.1	3.17	15.31	81.52	0.63	0.5	14,395	15,031	22516
6800	81-27 A	58845	258.1 -259.2	4.1	7.29	16.39	76.32	0.53	1.5	13,846	14,338	22454
		58846	260.5 -261.4		3.89	15.63	80.48	0.5	0.5	14,532	14,874	22454
		58847	261.65-262.2		21.55	15.22	63.23	0.54	1.0	11,786	12,076	22454
	B	58848	265.4 -266.4	1.0	2.61	18.87	78.52	0.79	2.5	14,485	14,969	22454
6600	81-24	58801	170.5 -171.2	2.35	9.95	15.18	74.87	0.82	0.5	13,047	13,870	22425
		58802	171.7 -172.85		8.63	15.49	75.88	0.8	-	13,644	14,074	22425
	81-28 A	58819	260.7 -261.6	3.5	7.41	15.34	77.25	0.41	1.5	13,974	14,403	22516
		58820	262.2 -263.1		4.77	14.82	80.41	0.61	-	14,159	14,776	22516
		58821	263.4 -264.2		19.31	15.00	65.69	0.71	1.5	11,893	12,645	22516
	B	58822	271.6 -272.6	1.0	3.45	16.18	80.37	0.58	2.0	13,876	14,940	22516
6400	81-23 A	58792	271.4 -272.9	2.5	8.01	15.98	76.01	0.53	2.0	13,951	14,296	22425
		58793	273.1 -273.9		22.3	14.98	62.72	0.65	1.0	11,459	11,983	22425
	B	58794	277.6 -278.8	1.2	3.32	16.14	80.54	0.97	.5	14,631	15,158	22425
	81-32 A	3530	177.8 -178.5	3.3	4.98	17.15	77.87	0.6	2.0	14,192	14,704	22531
			179.3 -179.6	Not sampled								
		3540	180.0 -181.1		3.37	16.64	79.99	0.58	2.0	13,725	14,923	22531
	B		189.7 -190.8	1.1	No geological recovery. Not sampled							
6200	81-21 A	58772	275.8 -276.6	3.4	16.84	14.42	68.74	0.52	1.5	12,540	12,802	22386
		58773	276.6 -279.2		19.01	15.11	65.88	0.46	1.0	12,072	12,361	22386
	B		282.0 -283.0	1.0	Not sampled							
	81-34	64680	173.0 -174.0	5.6	17.24	14.14	68.62	0.49	0.5	12,156	12,632	22555
		64681	174.3 -175.9		15.39	17.46	67.15	0.47	-	12,130	12,663	22555
		64682	177.3 -178.6		2.82	16.51	80.67	0.73	2.0	14,431	15,086	22555
6000	81-20	58740	235.9 -238.3	2.4	15.71	13.82	70.47	0.48	-	12,561	12,841	22454
	81-37	64705	208.3 -209.4	5.6	11.93	15.2	72.87	0.52	1.5	12,962	13,564	22636
		64706	209.4 -211.8		24.65	15.7	59.65	0.47	1.0	10,468	11,285	22636
		64707	212.1 -213.9		17.61	15.3	67.09	0.75	1.5	11,599	12,649	22636
5800	81-18	58711	243.8 -245.5	5.2	6.31	14.58	79.11	0.57	0.5	14,202	14,528	22269
		58712	245.6 -246.8		12.95	14.5	72.55	0.52	-	13,063	13,362	22269
		58713	247.1 -249.0		6.52	15.69	77.79	0.68	1.5	14,228	14,465	22269
	81-38	64712	193.9 -197.2	5.8	9.05	15.61	75.34	0.51	1.5	13,312	14,047	22636
		64713	197.2 -198.7		2.5	17.28	80.22	0.65	1.5	14,182	15,103	22636
		64714	198.7 -199.7		8.45	16.91	74.64	0.68	2.0	13,230	14,200	22636
5600	*81-5	97882	236.7 -238.4	4.95	38.72	14.83	46.45	0.4	1.0	9,022	9,178	64-20021
		97883	238.4 -239.5		2.62	16.05	81.33	0.56	0.5	14,776	15,169	64-20022
		97884	240.0 -241.4		13.37	16.32	70.31	0.66	1.0	12,983	13,464	64-20023
		97885	241.4 -242.2		2.39	17.36	80.25	0.72	1.5	14,501	15,242	64-20024
	*81-8 A	97614	63.2 - 64.8	2.85	8.31	15.98	75.71	0.62	1.5	13,974	14,312	64-20092
		97615	65.3 - 66.15		5.42	15.67	78.91	0.67	1.0	14,260	14,644	64-20093
	B	97616	67.9 - 69.45	1.55	7.45	16.8	75.75	1.1	1.0	14,147	14,462	64-20094
	81-33	3564	263.2 -265.8	6.2	15.98	13.38	70.64	0.52	0.5	12,511	13,065	22598
		3565	265.8 -267.0		6.88	15.29	77.83	0.56	0.5	13,842	14,422	22598
		3566	267.0 -268.5		8.38	15.11	76.51	0.59	1.0	13,565	14,264	22598
		3567	268.5 -269.4		1.84	17.34	80.82	0.79	3.0	14,888	15,360	22598
5400	*81-4	97866	259.1 -259.7	4.95	7.1	14.83	78.07	0.6	-	14,022	14,413	64-19970
		97867	259.7 -261.2		5.56	15.84	78.6	0.52	1.0	14,155	14,737	64-19971
		97868	261.2 -262.7		2.14	15.9	81.96	0.53	-	14,725	15,195	64-19972
		97869	262.7 -264.05		22.71	14.23	63.06	0.63	-	11,552	11,896	64-19973
	*81-7 A	97605	74.7 - 76.7	2.6	13.38	14.51	72.11	0.44	1.0	12,995	13,498	64-20068
		97606	76.9 - 77.3		25.54	13.95	60.51	0.58	-	11,074	11,209	64-20069
	B	97607	78.6 - 80.6	2.0	6.39	15.91	77.7	0.78	1.0	13,971	14,390	64-20070
	81-16	59502	201.6 -203.0	6.0	4.51	13.80	81.69	0.53	-	14,352	14,706	22269
		59503	203.0 -204.4		9.6	14.01	76.39	0.51	0.5	13,618	13,910	22269
		59504	204.4 -205.4		6.85	13.62	79.53	0.52	-	14,010	14,320	22269
		59505	205.9 -207.6		4.2	11.68	84.12	0.75	0.5	14,692	14,791	22269
	81-31	497	298.3 -300.15	5.0	4.86	16.53	78.61	0.51	2.0	14,035	14,632	22531
		498	300.2 -301.6		5.73	16.79	77.48	0.48	2.0	13,653	14,562	22531
		499	301.7 -303.3		4.58	16.92	78.5	0.65	2.0	14,011	14,849	22531
5200	81-13	56423	304.6 -306.0	5.5	3.88	14.21	81.91	0.48	-	14,479	14,876	22454
		56424	306.0 -307.7		9.14	15.73	75.13	0.45	1.0	13,372	13,995	22454
		56425	308.0 -308.3		4.52	16.59	78.89	0.77	1.5	14,622	14,897	22454
		56426	308.6 -310.1		6.82	15.71	77.47	0.7	1.5	14,080	14,501	22454
	81-14	59483	190.7 -191.5	11.1	17.21	14.9	67.89	0.49	-	12,449	12,724	22120
		59484	191.5 -193.0		2.98	15.05	81.97	0.5	-	14,726	15,125	22120
		59485	193.0 -196.2		16.22	14.76	69.02	0.45	-	12,590	12,930	22120
		59486	197.2 -199.0		16.22	15.06	68.72	0.66	1.0	12,749	13,005	22120
		59487	200.3 -201.8		3.72	15.86	80.42	0.82	1.5	14,631	15,037	22120
	81-29	58744	393.1 -394.5	4.9	3.73	15.02	81.25	0.45	-	14,393	14,933	22516
		58745	394.5 -396.5		13.06	15.17	71.77	0.56	1.5	12,331	12,814	22516
		58746	396.5 -398.0		2.63	17.16	80.21	0.68	2.0	14,390	14,964	22516
	81-36	64690	179.8 -182.1	6.1	4.55	14.19	81.26	0.45	-	14,353	14,836	22598
		64691	182.1 -183.9		5.1	15.24	79.66	0.44	0.5	14,141	14,867	22598
		64692	184.4 -185.9		8.4	15.86	75.74	0.66	1.0	13,403	14,171	22598

DIAMOND DRILLING AND TRENCHING REPORT ON COAL LICENCES 3986 TO 3993 INCLUSIVE AND 6792 PINE RIVER AREA LIARD MINING DIVISION NTS 93 O/9

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

Owner of Licences: J.W. MacLeod, P.Eng.

Operator: Semper Resources Inc.

Consultant: G.A. Noel & Associates, Inc.

Authors: A.S. Marton, B.Sc.,
Project Geologist

Harold M. Jones, P.Eng.

Date: May 31, 1981

TABLE OF CONTENTS

FIGURES AND TABLES

Figures

Table

I N D E X

EXHIBITS IN APPENDIX

SUMMARY

From October, 1980 to March, 1981, G.A. Noel & Associates, Inc., on behalf of Semper Resources Inc., conducted an exploration program on their Willow Creek coal licences. Work consisted of backhoe trenching followed by diamond drilling. This exploration was concentrated on licence 3992 upon which significant coal seams were exposed during a preliminary program in July-August, 1980.

Seven trenches totalling 1835 metres were excavated. These exposed eight coal zones and traced 2 of them along a strike length of 500 metres.

Twelve HQ holes totalling 3008 m were diamond drilled to test the coal zones both along strike and at depth. Eight zones greater than 1.5m were intersected within the upper part of the Gething Formation. From the limited data to date, the coal zones are inferred to lie within the east limb of the Willow Creek anticline upon which is superimposed a small gently dipping synclinal fold.

More detailed drilling is required before a coal reserve may be calculated. However, assuming continuity over 1900 m strike length of the eight significant seams, 18.4 million tonnes of coal resources are indicated within the drilling area. A further 33 million tonnes of resources are inferred down dip to the 700 m elevation and along strike to the north. Assay data indicates that of this total, approximately 4 million tonnes may be of metallurgical grade while the remainder is thermal coal.

It was concluded that additional diamond drilling is required to fully assess the potential of the coal licences.

It was recommended that the program of trenching and diamond drilling be continued. This program is estimated to cost $2 million.

INTRODUCTION

Semper Resources Inc. hold nine contiguous coal licences in the Willow Creek area of the Pine River Valley 49 km west of Chetwynd, B.C., (Fig. 1, 2).

G.A. Noel & Associates, Inc., on behalf of the company, conducted geological mapping and backhoe trenching programs on the licences during the months of July and August of both 1979 and 1980. The above work was successful in locating several significant coal seams on licence 3992.

When Semper Resources Inc. financing was finalized in late 1980, an additional program of backhoe trenching followed by diamond drilling was undertaken. This work was carried out between October 1, 1980 and March 8, 1981 and is documented in this report by the writer, under the supervision of H.M. Jones, P.Eng.

A temporary winter bridge was constructed across the Pine River to give ready access to the licences from Highway 97. This bridge was removed when the field work terminated.

Property

The property consists of nine coal licences (Figure 3, 5). They are:

Coal Licence	Hectares	Expiry Date
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	"
6792	293.0	December 5, 1981

Total area 2633.2 Hectares

Coal Licences 3986 - 3993 are owned by:

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

They are presently held under option by:

Semper Resources Inc.
1012 - 475 Howe Street
Vancouver, B.C.

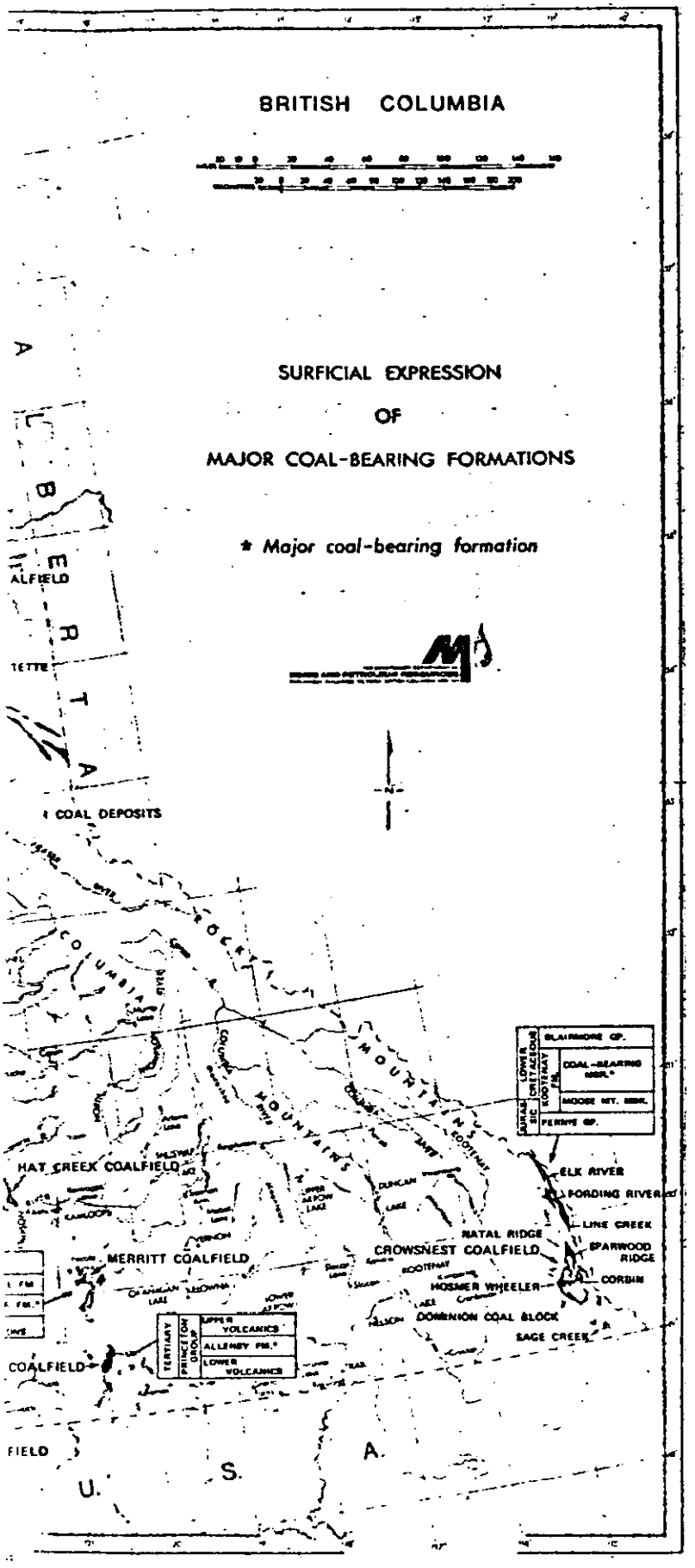
Semper Resources Inc. is the owner of licence 6792.

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 1.5 km wide Pine River Valley. In the licences area there is a change in elevation relative to the Pine Valley of only 670 metres (Figure 4,5).

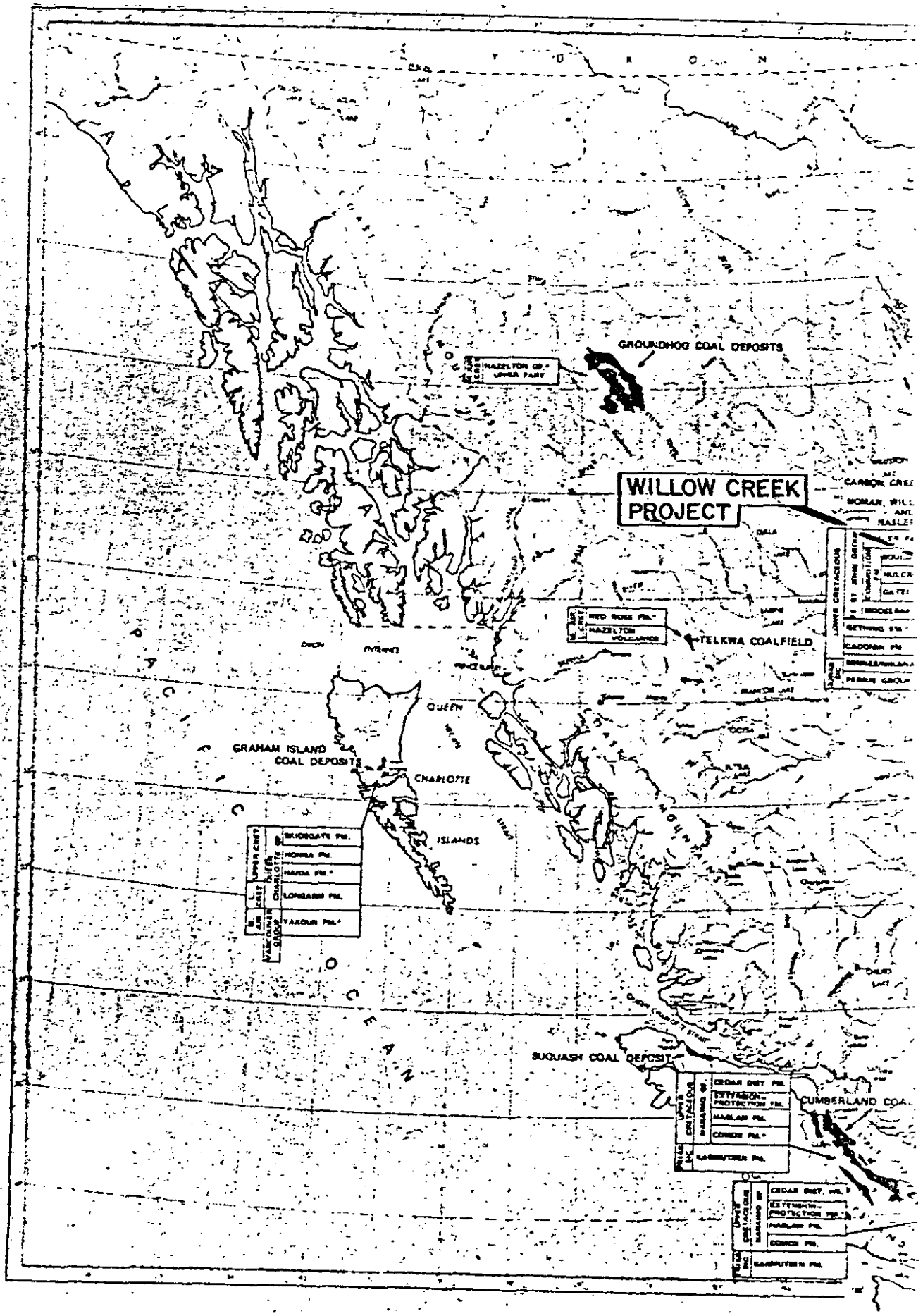
All coal licences are well forested by jackpine and minor spruce. Poplar stands are common in low areas, like Pine Valley, and in wet areas, such as creeks and seepages.

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.



SEMPER RESOURCES INC.			
WILLOW CREEK PROJECT			
COAL LICENCES 3986-3993 & 6792			
SURFICIAL EXPRESSION OF MAJOR COAL-BEARING FMS.			
SCALE: AS SHOWN	NTS BRITISH COLUMBIA	DWG. NO.	
DATE / REVISIONS APRIL 1981		DWG. BY	WORK BY G.A. NOEL & ASSOC.

Figure


GROUNDHOG COAL DEPOSITS
WILLOW CREEK PROJECT
TELKWA COALFIELD
GRAHAM ISLAND COAL DEPOSITS
QUEEN CHARLOTTE ISLANDS
SUQUASH COAL DEPOSIT
CUMBERLAND COAL
PACIFIC OCEAN

Location and Access

The property is located at the following approximate co-ordinates 55°36'north latitude; 122°14'west longitude.

The coal licences are located in the Peace River district of northeast British Columbia (see Figure 1). They are situated adjacent to the Pine River, approximately 50 km west of Chetwynd and 190 km north-northwest of Prince George.

Access to the general area is via British Columbia highway 97, which is an all weather road connecting Prince George to Dawson Creek, and passes through the Pine Valley and Chetwynd. B.C Rail also passes through the Pine Valley (see Figure 2) with the highway on the north side and the railway on the south side of the river. B.C. Rail crosses the northwest corners of licences 3988 and 3993. The abandoned Falls railway siding is located on the northwest corner of licence 3988 (see Figure 3).

Dawson Creek and Fort St. John, approximately 100 km and 160 km respectively north of Chetwynd, are serviced with daily flights by commercial airlines. Rental vehicles are available at both airports.

The coal licences are accessible on a year round basis by helicopter from Chetwynd, where several operators offer a wide selection of turbine equipment. On a seasonal basis, the licences are accessible by several kilometres of seismic roads, which originate at highway 97. These require fording the Pine River with a 4x4 vehicle during periods of low water.

During the winter drilling program, extreme fluctuations in the water flow made fording impossible. For this reason a temporary wooden bridge was constructed.

Once across the river a good dirt road follows the east side of Willow Creek. It passes a capped gas well Hunt - Sands - Sun - Falls C-18-6 at 2.5 km from the river crossing. At 3 km along this road a winter seismic line access road branches off to the east and joins a northeast trending seismic line. Due to very wet ground, the winter road could not be used. A new road was constructed nearby on a portion of dry side hill and provided vehicle access to the drilling and trenching area (figure 4).

History

Coal in the Peace River district of northeastern British Columbia was known of 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 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 north-west 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 only using seams of 1.2 m. or greater in thickness.

Coal licences 3986 to 3993 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 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.

Also, in 1969, Bremeda Resources Ltd. commenced work on the Sukunka deposit located approximately 55 km southeast of the Pine River area. Early work in this district quickly indicated the potential of the Bullmoose Mountain area as a major coal field. Three deposits are now proven in this area and will be brought into production when transportation facilities are arranged. They are the Sukunka, Bullmoose and Quinette deposits (see Figure 2).

In 1979 Semper Resources Inc. acquired coal licences 3986-3993 and conducted reconnaissance geological mapping on parts of the licences. Areas of interest located during the above were tested by backhoe trenching during July and August, 1980. (Figure 4).

1980-81 EXPLORATION

Fieldwork on the Willow Creek coal licences was conducted in two stages. The first stage consisted backhoe trenching, geological mapping of the trenches and sampling of tne coal seams exposed in the trenches. This work included digging four trenches on licence 3987 totalling 763 metres and one trench on licence 3992 totalling 297 metres. This work was reported by Jones (1980).

The work referred to above was successful in exposing three significant coal seams on licence 3992. As a result of this encouragement Semper Resources Inc. resumed backhoe trenching in October 1980, then followed up with a diamond drill program. The object of the additional exploration was to further expose, along strike, the significant coal seams on licence 3992, explore for additional seams, and to test the seams at depth by drilling.

Mobilization

The backhoe and drilling equipment were moved to the property via highway transport to the river crossing, then forded across and moved to coal licence 3992. A tent camp was originally set at the Pine River ford but was closed with the coming winter. The crews then commuted out of Chetwynd.

Road Construction

Access to the trenching area on licence 3992 was via a short, steep, wet section of winter cat road which branched off to the east from the gas well service road. This winter road was not passable by 4x4 vehicle. In order to service the backhoe and later the drilling program, a new road was constructed to by-pass the winter road. Approximately 2 km of new access road was constructed by P. Demeullemeister of Chetwynd, B.C. Drill site access roads, upgrading of property roads and drilling mobilization were achieved using a D-6 owned by W. & J. Schilling, also of Chetwynd, B.C. (See figure 6).

Grid Survey

A grid was laid out to cover the main area of interest on licences 3991 and 3992. The survey was made using a Brunton compass and nylon chain. A N45E baseline was run along the seismic line, with parallel grid lines laid out at 200 metre intervals. All trenches, roads, drill holes, etc., were tied to this grid.

Trenching

Trenching was carried out by a John Deere 450C Crawler-type combination front end loader-backhoe owned and operated by Stan Brewer of Vernon, B.C.

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 bedrock. Two trenches, which were intended to freshen up old government bulldozed trenches, failed to reach bedrock.

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

A total of seven trenches were dug. Two trenches were excavated along the bulldozed seismic line as continuations of trench 5 (from the previous program), three were step-outs from trench 5 to the northwest and two were attempts of re-opening old government trenches.

Geological Mapping

Geology was mapped and coal seams sampled as soon as sufficient trenching was completed to permit safeworking 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. Coal seams were later transferred to 1:2000 scale plans and cross sections (Figures 6, 7-12).

Diamond Drilling

Twelve HQ diamond drill holes were completed by Olympic Drilling Co., using a Longyear 38 drill (Table 3). The drill set-up was unitized and winterized. It was moved from site to site with a D-6 bulldozer which also prepared the sites and roads. Water for drilling was initially pumped up to 1200 m from a spring then fed down to the drill. Until temperatures dropped to -10°C one coil stove water heater was sufficient to keep the lines open. Below this temperature water lines were frozen.

When freezing lines made pumping water impossible, Gallant Trucking of Kamloops was contracted to haul water to the drill. They supplied a four-wheel drive tank truck and a 3000 gallon storage tank, both with built in heating units. Water was trucked 3 to 5 km from near the confluence of Willow Creek and the Pine River to the various drill sites.

Initially, core recovery in coal seams was not always acceptable. However, as the writer became familiar with the geology, he could predict the approximate location of the various seams. The drillers were then notified of these locations which, when approached in drilling, would be drilled at a slower rate. As soon as the seam was intersected, the core tube would be emptied, then drilling resumed up to a maximum of 5 feet (1.5 m) per run until the seam had been crossed. As soon as the footwall was entered, the tube would be emptied again. It was found that if hanging and footwall rocks as well as large partings were removed from the core tube, grinding of coal was kept to a minimum.

All drill core was geologically logged on the appropriate forms and plotted as both stratigraphic columns and as drill hole sections. (Figure 14).

Geophysical Surveys

Roke Oil Enterprises Limited of Calgary were contracted to conduct down hole geophysical surveys on each hole upon completion of drilling. Data recorded included Gamma-ray neutron, sidewall densilog, caliper, focused beam and directional surveys (see Appendix).

Data from these surveys aided the writer in interpreting the coal content of the seams, interpreting between seams, and the logs were also valuable in the interpretation of seams in which core losses have occurred.

Bridge Construction

Initially, access to the working area was from highway 97 via a ford across the Pine River. Fluctuations in the river level often made this crossing impossible to 4x4 vehicles, so a small boat was used to ferry the crew over the river. When the river began to freeze and temperatures dropped to $-20^{\circ}C$ to $-40^{\circ}C$ neither fording nor boat travel were possible.

A logging road type timber bridge was then constructed which permitted vehicle access to the property. A railroad crossing was constructed by B.C. Rail to enable safe crossing of their tracks.

The bridge was removed upon termination of the drilling program.

GEOLOGY

Regional Geology

The Rocky Mountains consist of a complex series of closely folded, faulted and thrusted 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. (Table 1).

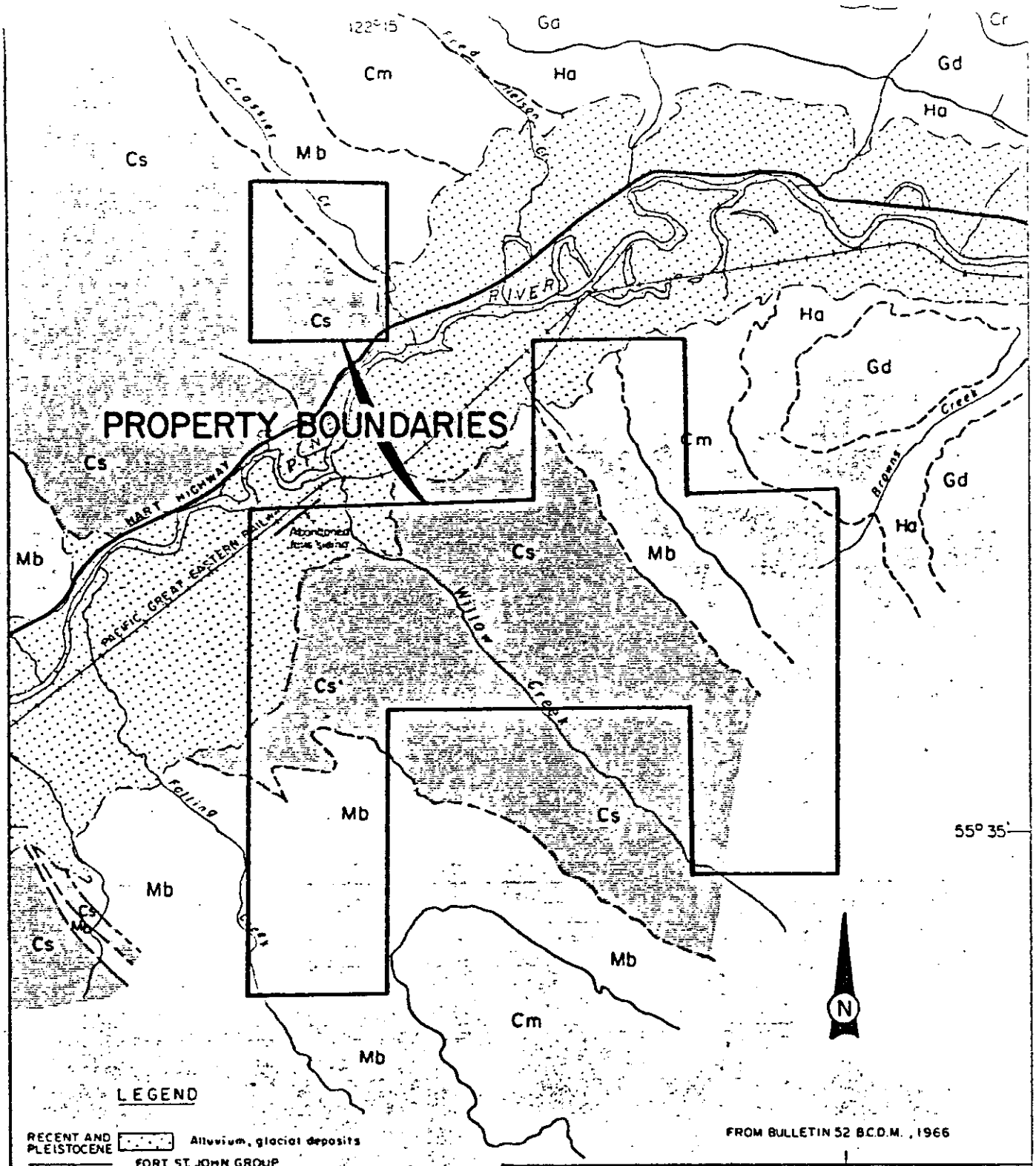
Bullhead and Fort St. John Formations outcrop in the Pine River area on and in the vicinity of coal licence 3986-3993, 6792. (See Figure 13). In this area they occur in a broad anticlinorium near the eastern limit of the strong Foothills deformation. Considerable literature is available on the Foothills 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).

Local Geology

The Semper Resources Inc. coal licences cover the northern part of the Willow Creek anticlinorium and are underlain mostly by rocks of the Lower Cretaceous Gething Formation, the coal



SEMPER RESOURCES INC.

WILLOW CREEK PROJECT

COAL LICENCES 3986 - 3993 & 6792

REGIONAL GEOLOGY PINE VALLEY AREA

SCALE 1:63,360	NTS 93-O-9	DWG. NO
DATE / REVISIONS APRIL 1981	DWG BY	WORK BY K. ANGEL & ASSOC.

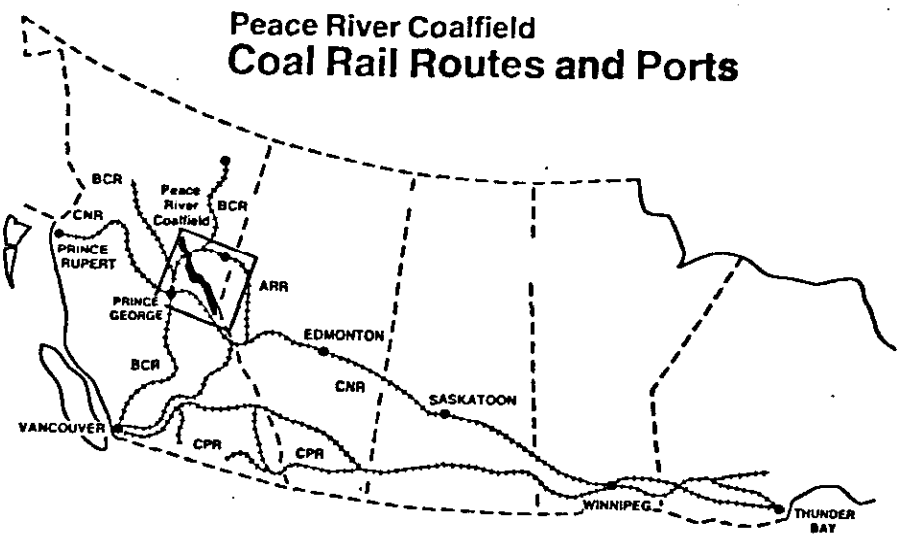
TABLE 1

TABLE OF FORMATIONS

Series	Group				
Upper Cretaceous	Fort St. John		Dunvegan (350-1,200)		Fine- to coarse-grained sandstone, conglomerate; carbonaceous shale and coal
			Dunvegan	300-1200	Marine and non-marine sandstone and shale
		Shaftesbury 400-900'	Cruiser Fm.[1]	350-800	Dark grey marine shale with sideritic concretions; some sandstone
			Goodrich Fm.[1]	50-1350	Fine-grained, crossbedded sandstone; shale and mudstone
			Hasler Fm.[1]	500?-1500	Silty, dark grey marine shale with sideritic concretions; siltstone and sandstone in lower part; minor conglomerate
Lower Cretaceous		Commotion 1080-1600'	Boulder Creek Member	240-560	Fine-grained, well sorted sandstone; massive conglomerate; non-marine sandstone and mudstone
			Hulcross Member	0-450	Dark grey marine shale with sideritic concretions
			Gates Member	220-900	Fine-grained, marine and non-marine sandstones; conglomerate; coal; shale and mudstone
			Moosebar	100-1000	Dark grey marine shale with sideritic concretions; glauconitic sandstone and pebbles at base
Lower Cretaceous	Bullhead Group 0-2,500 feet (0-750 m)		Gething Formation	0-1,800 feet (0-540 m)	Fine-grained, cherty to quartzose sandstone; rusty weathering shale; carbonaceous mudstone and coal seams; minor conglomerate
			Cadomin Formation	0-770 feet (0-230 m)	Massive chert conglomerate and coarse-grained sandstone; carbonaceous shale; minor coal

Regional erosional unconformity; bevels rocks of succeedingly older age northward and eastward

Peace River Coalfield
Coal Rail Routes and Ports

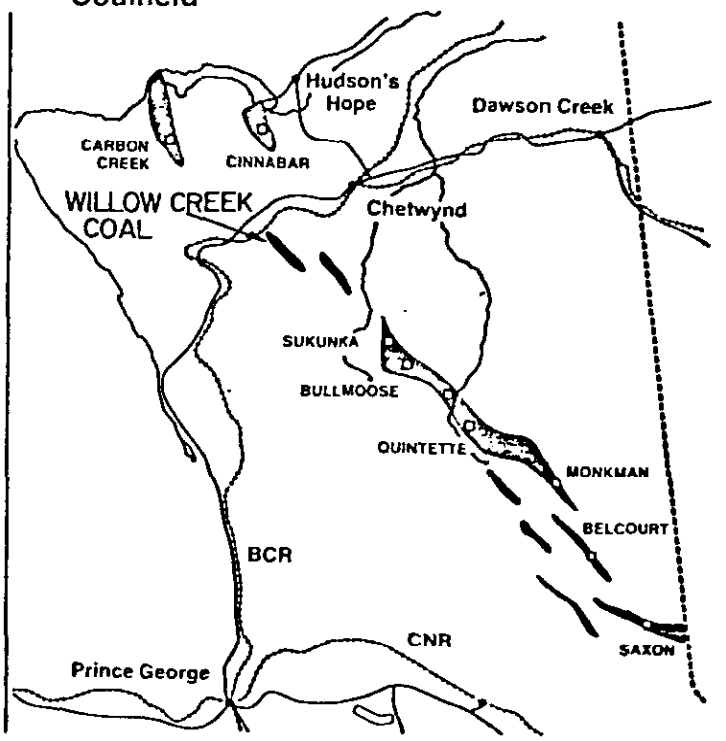


Peace River Coalfield
Coal Resources

Resource	Millions of Tonnes
Measured	300
Indicated	285
Inferred	7,720

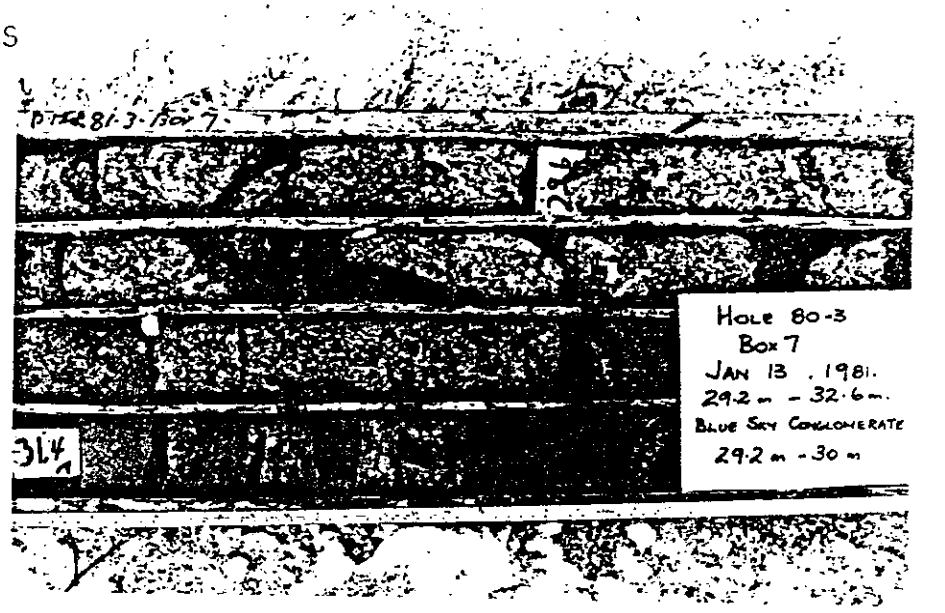
Metallurgical - 85% Thermal - 15%

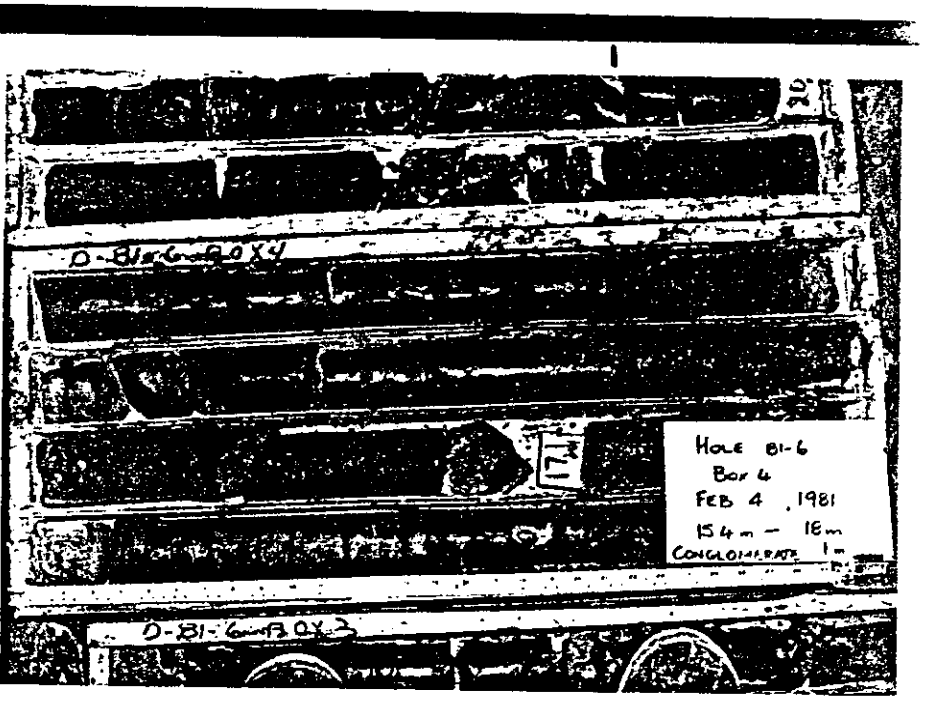
Northeast Region
Peace River Coalfield

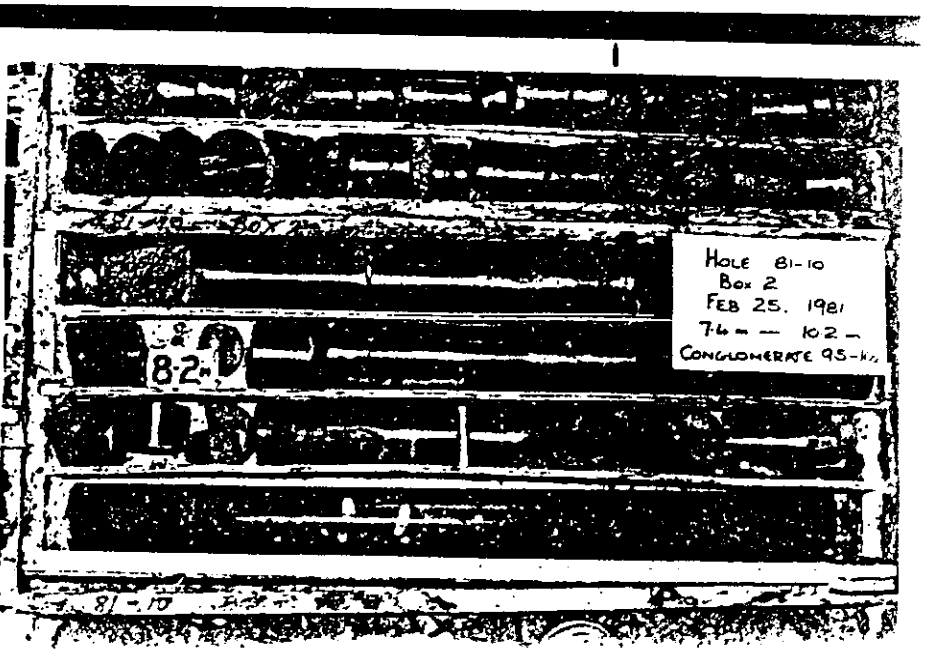


— Existing Roads
— Existing Railways
• Existing Communities
□ Proposed Mines

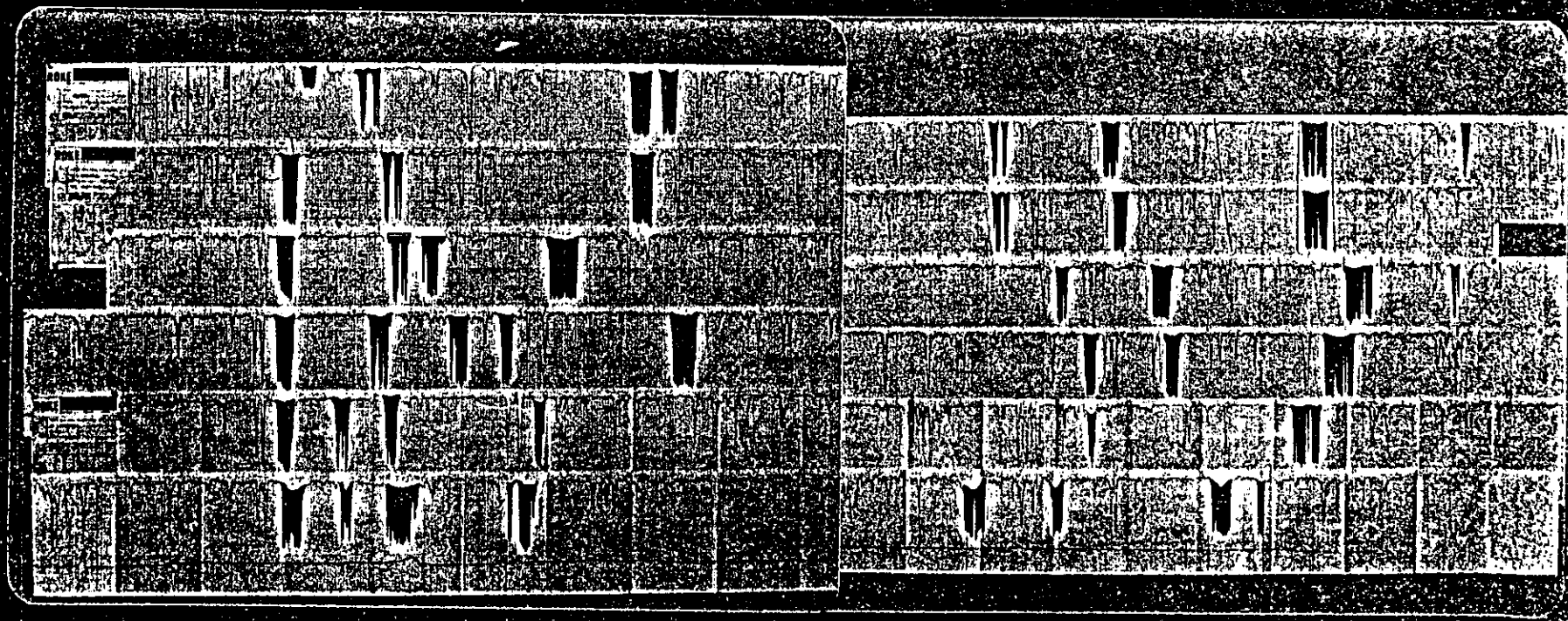
BLUE SKY CONGLOMERATES







GEOPHYSICAL LOGS–CROSS SECTION 600E



SUMMARY OF COAL SEAM DIMENSIONS .. continued

Location D.D.H.	Observed Width (m)	Recovery %	Geophysical Log Widths (m)	True Coal Zone (m)	Total Coal (m)
			SEAM FIVE		
81-5(A)	1.7	100	1.1	2.0	2.0
(B)	0.8	100	0.9		
81-8	-	0	3.5	3.5	2.9
81-4(A)	1.2	95	3.0	3.0	2.1
(B)	0.5	100	ND	ND	ND
81-7(A)	0.55	64	2.4	2.4	2.0
(B)	0.8	95			
80-3	1.9	90	2.2	2.2	1.9
80-2	3.0	90	2.9	2.9	2.3
80-1	-	0	2.4	2.4	2.1
81-6	2.4	97	2.1	2.1	1.9
81-9	0.7	93	ND	ND	ND
81-10	4.3	97	4.3	2.6	2.5
			SEAM SIX		
81-5	3.45	87.5	2.9	2.9	2.7
81-8	3.1	93	2.8	2.8	2.4
81-4	2.45	95	2.6	2.6	2.6
81-7	3.0	93.5	2.9	2.9	2.9
80-3	3.5	95	3.5	3.5	3.5
80-2	3.2	95	3.0	3.0	3.0
80-1	2.4	67.5	2.7	2.7	2.7
81-6	2.5	100	2.6	2.6	2.6
81-9	1.8	90	1.5	1.1	1.1
81-10	2.2	98	2.1	1.3	1.3
			SEAM SEVEN		
81-5	4.95	98	5.2	5.2	4.1
81-8(A)	1.6	100			
(B)	0.85	80	6.2	6.2	4.0
(C)	1.55	83			
81-4	4.95	91	5.0	5.0	4.2
81-7(A)	2.0	93			
(B)	0.4	67	5.6	5.6	4.3
(C)	2.0	77			
80-3	5.1	90	5.4	5.4	4.4
80-2	4.2	86.2	5.5	5.5	5.5
80-1	5.2	74.1	5.6	5.6	5.6
81-6	5.45	93	6.0	6.0	4.8
81-9	4.35	80	5.05	4.1	3.2
81-10(A)	3.6	53	4.05	2.3	3.2
(B)	1.35	93	1.4	.9	

bearing upper member of the Bullhead Group. (See Table 1). The anticlinorium is defined by rocks of the Bullhead and Fort St. John Groups. The contact between the Groups is marked by a thin bed of chert pebble conglomerate (Blue Sky Conglomerate) which is well exposed on licence 3987 in trench 3 (Jones, 1980) and on licence 3992 in outcrop and in DDH's 80-3, 81-6 and 81-10 (see photos, Fig.6). This conglomerate marker bed designates the top of the Gething Formation and was used in correlating coal seams in DDH's 81-5, 81-4, 80-3, 81-6, 81-9 and 81-10 (see Figure 14). Down hole geophysics enabled good correlation between seams (see photos).

Within the trenching and drilling area on licence 3992, outcrop is sparse. The most geologically tested area is in the vicinity of the bulldozed seismic line, section 00N. Work along this includes trenches 5, 5A and 5B, and diamond drill hole 80-1, 80-2, 80-3, 81-11 and 81-12. Interpretation of the geology from the above work indicates a small, gentle fold on the east limb of the much broader Willow Creek Anticline (see section 00N, Figure 9). The synclinal axis is marked by a fault visible in a road cut 20 m east of DDH 80-1. It is speculated that the fault correlates with one cut in DDH 80-2 at 100 m.

The bedrock appears sto be oxidized to an average of 11 m below the surface (Table 2).

Coal Development

Eight major coal zones (greater than/equal to 1.5 m) were found by trenching and drilling. The correlation chart summarizes the geology in the drilling area as well as illustrating the size and location of the major coal zones (Figure 14).

A summary of the size and recovery of the eight major coal zones is tabulated in Table 4.

The term coal zones was used to separate coal seams with waste partings from clean coal seams. (See Figures 7-12).

TABLE 2

LIMITS OF SURFACE WEATHERING

Diamond Drill Hole	Limit of Oxidation (from Geological Log)			Standing Water Level (from Gamma Ray/Neutron Log)
	Dip	Apparent Distance	True Distance from Surface	
DDH 80-1	-55°	10 m	8.2 m	?
80-2	-90° (vert)	N/D	-	34.5 m
80-3	-60°	17 m	14.7 m	?
81-4	-62°	12 m	10.6 m	?
81-5	-65°	16 m	14.5 m	3 m
81-6	-60°	17 m	14.7 m	?
81-7	-58°	14.5 m	12.3 m	54 m
81-8	-57°	9 m	7.5 m	13 m
81-9	-59°	16 m	13.7 m	31.5 m
81-10	-58°	10 m	8.5 m	10 m
81-11	-55°	9 m	7.37 m	1 m
81-12	-57°	10 m	8.4 m	11 m

COAL QUALITY

Sampling Procedure

Coal zone intervals were documented (geologic logging and photography) immediately after the drilling shift. The coal was sampled from the hanging wall to the footwall in its entirety if the coal seam was 1.5 to 2 m wide. If it was larger than 1.5 m it was sampled to the end of the first run length, the next sample to the end of the next run length, etc. Large partings > 10 cm were omitted from the sample but recorded in the geologic logs in either case. A 1.5 m sample of HQ core (with 100% recovery) made a convenient sample size for expediting.

From here samples were recorded, packaged and sent by Greyhound bus to Commercial Testing and Engineering Co. of North Vancouver. A sample result turnaround period for a single drill hole batch averaged 2-3 weeks.

From the assay data, coal zones 1, 2 and 3 include some coking coal. The remaining zones (4-8) are low to medium volatile bituminuous coal with low Ash averaging 0.6% sulphur and 14,000 BTU (Table 3,4,5).

TABLE 3

DRILL HOLES SUMMARY

Hole Number	Coordinates N/S	Coordinates E	Coal Licence	Bearing	Inclination	Collar Elev.	Total Depth	Date Started	Date Finished	Coal Zones Intersected
DDH 80-1	03N	125E	CL 3992	Gridwest	-55°	1092 m	248 m	Nov.19, 1980	Nov.24, 1980	#5,#6,#7,#8.
80-2	00N	276E	CL 3992	Vert	Vert	1110 m	260 m	Nov.25, 1980	Nov.30, 1980	#5,#6,#7,#8
80-3	00N	699E	CL 3992	Gridwest	-60°	1130 m	346.5m	Jan. 8, 1981	Jan.17, 1981	#1.#2.#3.#4. #6.#7
81-4	400N	671E	CL 3992	Gridwest	-62°	1090 m	295.5m	Jan.18, 1981	Jan.22, 1981	#1.#2,#4.#5. #7.#8
81-5	600N	621E	CL 3992	Gridwest	-65°	1085 m	282.5m	Jan.23, 1981	Jan.28, 1981	#1.#2.#4.#5. #7 #8
81.6	200S	700E	CL 3991	Gridwest	-60°	1130 m	323 m	Jan.29, 1981	Feb. 5, 1981	#1.#2.#3.#4. #6.#7
81-7	400N	120E	CL 3992	Gridwest	-58°	1095 m	252 m	Feb. 6, 1981	Feb.13, 1981	#5.#6.#7.#8. #10
81-8	600N	80E	CL 3992	Gridwest	-57°	1190 m	136 m	Feb.14, 1981	Feb.16, 1981	#5.#6.#7.#8
81-9	600S	630E	CL 3991	Gridwest	-59°	1165 m	328 m	Feb.18, 1981	Feb.23, 1981	#1 #2.#3.#4. #6.#7
81-10	1000S	671E	CL 3991	Gridwest	-58°	1165 m	316 m	Feb.24, 1981	Mar. 2, 1981	#1.#2.#3.#4. #6.#7
81-11	00N	605E	CL 3992	Gridwest	-55°	1115 m	154.5m	Mar. 3, 1981	Mar. 5, 1981	#1.#2.#4
81-12	02N	495E	CL 3992	Gridwest	-57°	1105 m	66 m	Mar. 6, 1981	Mar. 7, 1981	#4
							3008 m			

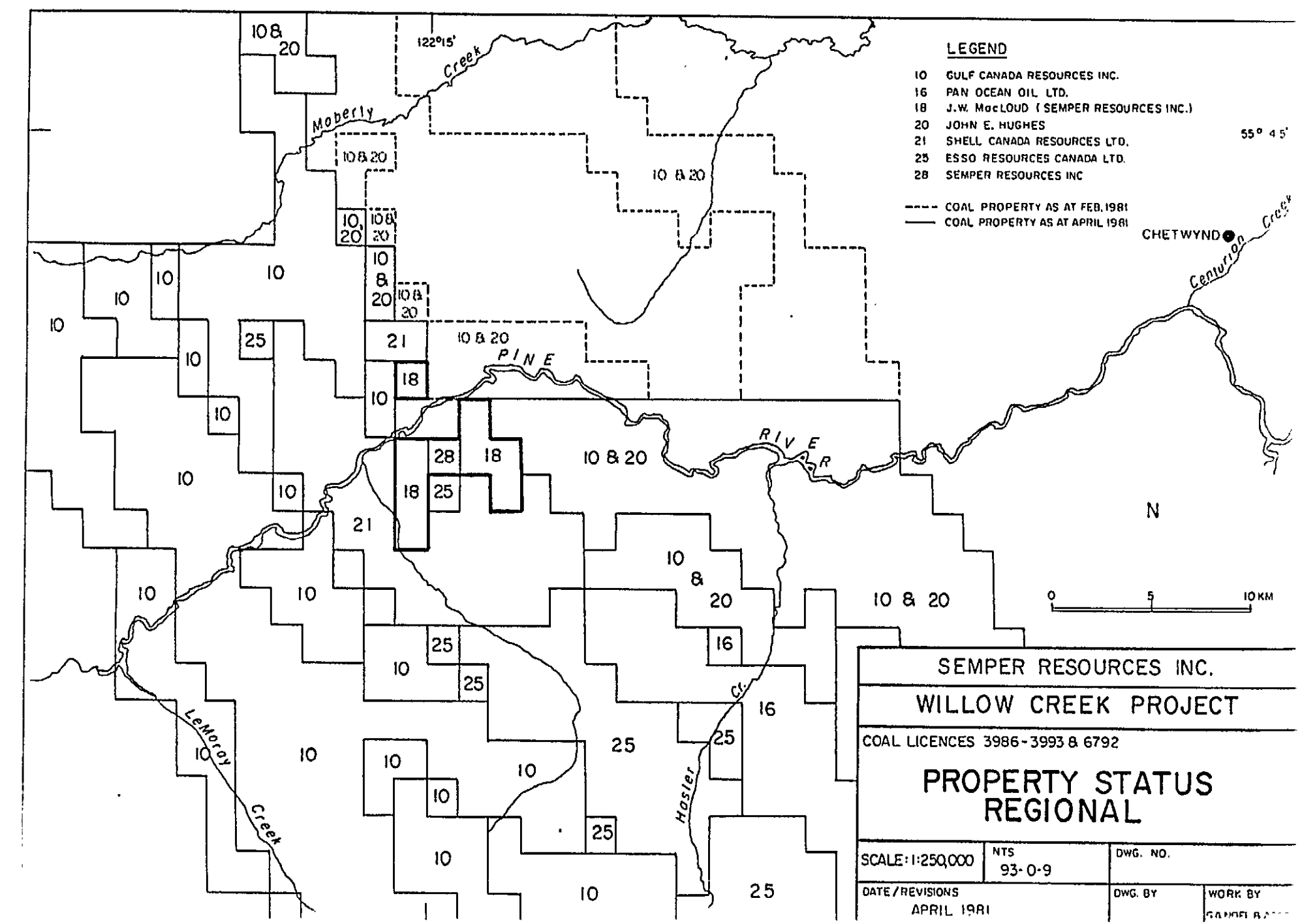
TABLE 4

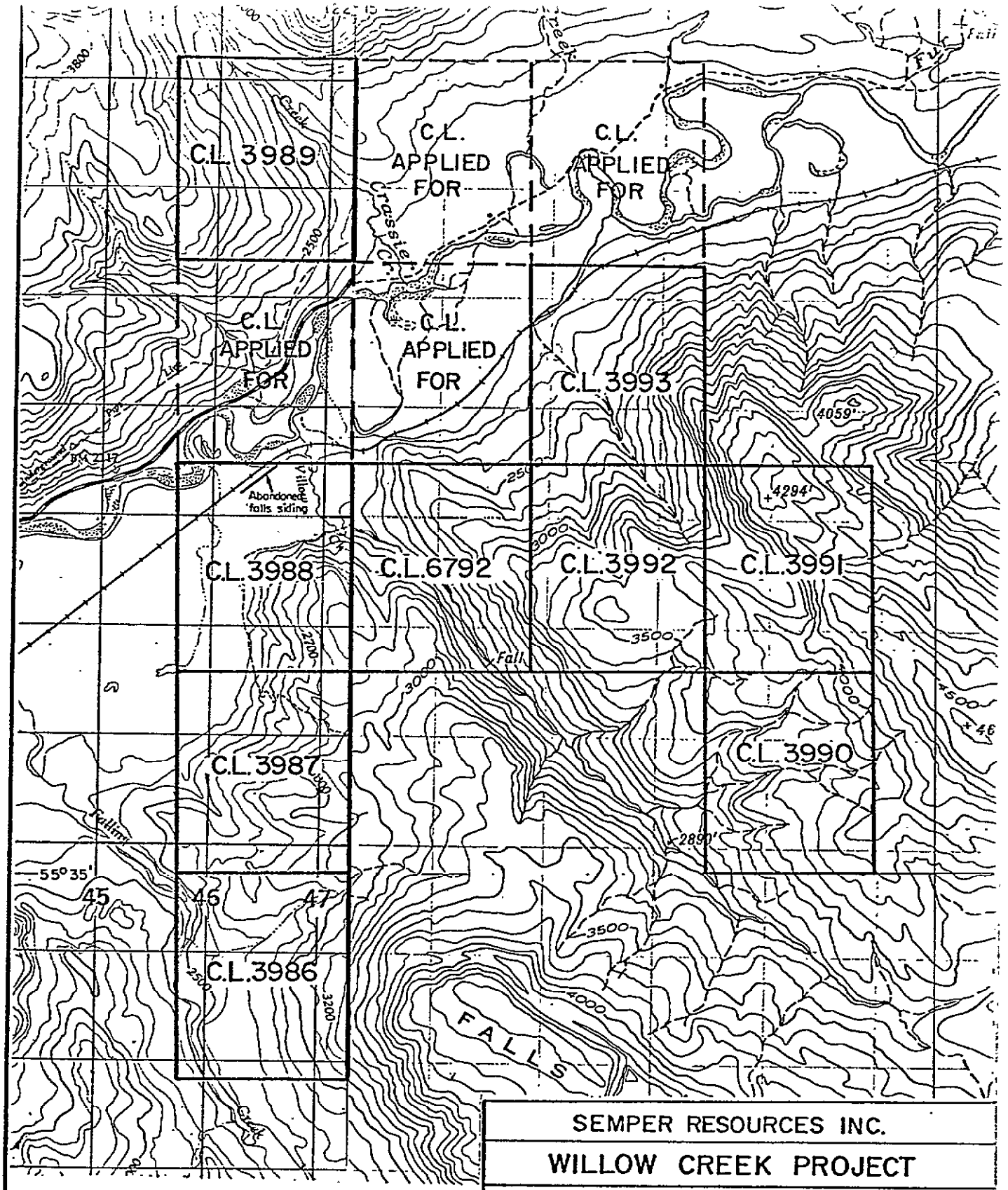
SUMMARY OF COAL SEAM DIMENSIONS

Location D.D.H.	Observed Width (m)	Recovery %	Geophysical Log Widths (m)	True Coal Zone (m)	Total Coal (m)
SEAM ONE					
81-5	1.0	90	5.9	5.9	4.2
81-4	2.3	87	2.7	2.7	2.7
80-3	2.25	76.5	2.6	2.6	2.6
81-11	3.1	55	2.5	2.5	2.5
81-6	2.88	94	2.9	2.9	2.9
81-9	3.2	65	2.6	2.6	2.6
81-10	3.45	73.5	3.5	3.5	3.5
SEAM TWO					
81-5(A)	1.0	73	3.6	3.6	2.3
(B)	Not sampled				
81-4(A)	1.05	85	3.3	3.3	2.2
(B)	0.87				
80-3(A)	No Recovery		1.7	2.7	1.7
(B)	No Recovery		1.0		
81-11	2.6	90	2.9	2.9	2.0
81-6	1.6	95	3.1	3.1	2.5
81-9	1.0	50	2.0	2.0	1.3
81-10	0.9	90	1.2	1.2	0.6
SEAM THREE					
80-3	1.85	68.5	2.0	2.0	2.0
81-11	2.2	84	3.0	3.0	1.8
81-6	2.6	87	3.1	3.1	2.5
81-9	1.1	67	2.0	2.0	2.0
81-10	4.5	66	4.5	4.5	4.5
SEAM FOUR					
81-5(A)	3.4	80	3.7	3.7	6.2
(B)	3.0	84	2.5	2.5	
81-4	3.85	89	3.8	3.8	3.8
80-3	4.0	15	5.2	5.2	5.2
81-11	4.0	95	3.3	3.3	3.3
81-12	1.9	33	2.5	2.5	2.5
81-6	3.7	73	4.0	4.0	4.0
81-9	No Recovery		2.6	2.6	1.3
81-10(A)	No Recovery		0.65	4.1	2.8
(B)	1.5	46	3.45		

SUMMARY OF COAL SEAM DIMENSIONS .. continued

Location D.D.H.	Observed Width (m)	Recovery %	Geophysical Log Widths (m)	True Coal Zone (m)	Total Coal (m)
			SEAM EIGHT		
81-5	1.1	100	1.1	1.1	0.7
81-4		...	1.5	1.5	0.7
81-8	0.6	75	1.6	1.6	1.2
81-7	1.3	90	1.7	1.7	1.7
80-3	1.5	98	0.9	0.9	0.4
80-2	2.6	100	2.7	2.7	1.8
80-1	2.9	83.3	1.9	1.9	1.6
				÷	1.2


LEGEND
10 GULF CANADA RESOURCES INC.
16 PAN OCEAN OIL LTD.
18 J.W. MacLOUD (SEMPER RESOURCES INC.)
20 JOHN E. HUGHES
21 SHELL CANADA RESOURCES LTD.
25 ESSO RESOURCES CANADA LTD.
28 SEMPER RESOURCES INC
COAL PROPERTY AS AT FEB. 1981
COAL PROPERTY AS AT APRIL 1981
122°15'
55° 45'
CHETWYND
Centurion Creek
Moberly Creek
PINE RIVER
LeMoray Creek
Hasler Cr.
N
0 5 10 KM
SEMPER RESOURCES INC.
WILLOW CREEK PROJECT
COAL LICENCES 3986-3993 & 6792
PROPERTY STATUS REGIONAL
SCALE: 1:250,000
NTS 93-0-9
DWG. NO.
DATE / REVISIONS APRIL 1981
DWG. BY
WORK BY



SEMPER RESOURCES INC.

WILLOW CREEK PROJECT

COAL LICENCES 3986-3993 & 6792

COAL LICENCE MAP

SCALE 1:50,000	NTS 93-O-9	DWG. NO.	
DATE/REVISIONS APRIL 1981		DWG. BY	WORK BY G.A. NOEL & ASSOC

0 2 KM.

SUMMARY OF COAL QUALITY

Location D.D.H.	Sample No.	Interval (m)	Width (m)	Ash	Volatile Matter	Fixed Carbon	Sulphur	F.S.I.	B.T.U. (Moist)	B.T.U. (Dry)	Type	Analysis Report No
				% Values - Dry Assay								
					SEAM ONE							
81-5	97871	7.5 - 8.5	1.0	20.09	22.95	56.96	0.66	1½	11,240	11,830	Thermal	64-20010
81-4	97851	30.4 - 31.1	0.7	3.50	21.3	75.2	0.56	2	14,440	14,894	Thermal	64-19955
	97852	31.1 - 32.7	1.6	3.18	24.39	72.43	0.53	6	14,429	14,921	Coking	64-19956
80-3	438	71.6 - 72.2	0.6	19.29	27.21	53.5	0.42	1½	11,105	11,625	Thermal	64-19912
	439	72.2 - 73.85	1.65	2.5	21.14	76.36	0.31	1	14,413	15,083	Thermal	64-19913
81-11	97644	13.1 - 14.3	1.2	7.11	21.42	71.47	0.44	1	13,466	14,102	Thermal	64-20128
	97645	14.3 - 16.2	1.9	12.38	21.54	66.08	0.43	2	12,838	13,660	Thermal	64-20129
81-6	97887	55.47- 57.0	1.53	2.08	21.83	76.09	0.44	1½	14,516	15,089	Thermal	64-20045
	97888	57.0 - 58.35	1.35	25.41	21.18	53.41	0.51	8	10,832	11,125	Coking	64-20046
81-9	97619	38.1 - 41.3	3.2	6.55	22.36	71.09	0.44	3	13,794	14,357	Thermal	64-20097
81-10	97627	54.8 - 57.0	2.2	7.26	22.3	70.44	0.47	2½	13,544	14,281	Thermal	64-20111
	97628	57.0 - 58.25	1.25	6.39	26.21	67.4	0.50	9	13,758	14,636	Coking	64-20112
					SEAM TWO							
81-5	97872	21.9 - 22.9	1.0	16.57	20.92	62.51	0.56	4½	12,168	12,498	Thermal	64-20011
81-4(2A)	97853	49.05- 50.1	1.05	19.2	21.91	58.89	0.63	7½	12,015	12,420	Coking	64-19957
(2B)	97854	51.0 - 51.55	0.55	6.83	20.61	72.56	0.62	1½	14,060	14,413	Thermal	64-19958
	97855	51.75- 52.07	0.32	7.66	24.57	67.77	0.76	7½	14,214	14,506	Coking	64-19959
81-11	97646	31.4 - 35.5	1.4	17.55	20.02	62.43	0.72	2½	12,292	12,847	Thermal	64-20130
	97647	35.7 - 36.9	1.2	15.12	21.23	63.65	0.5	3½	13,285	13,853	Thermal	64-20131
81-6	97889	73.4 - 75.0	1.6	47.64	14.65	37.71	4.53	1	6,660	6,986	Waste	64-20047
81-9	97620	48.9 - 50.9	1.0	27.79	20.51	51.7	0.41	2½	10,669	10,886	Thermal	64-20098
81-10	97629	65.8 - 66.7	0.9	46.52	18.48	35.0	0.37	6	7,074	7,359	Waste	64-20113
					SEAM THREE							
80-3	440	98.4 -100.25	1.85	5.17	19.74	75.09	0.44	1½	13,941	14,454	Thermal	64-19914
81-11	97648	40.65- 41.15	0.5	34.7	17.72	47.58	0.51	3½	8,685	9,737	Thermal	64-20132
	97649	41.75- 43.9	2.15	13.29	25.56	61.15	0.47	2	12,527	13,358	Thermal	64-20133
81-6	97890	87.4 - 88.9	1.5	6.48	20.57	72.95	0.35	1	13,795	14,291	Thermal	64-20048
	97891	88.9 - 90.0	1.1	7.85	23.92	68.23	0.39	1	13,350	13,887	Thermal	64-20049
81-9	97621	57.8 - 59.85	1.1	11.98	24.26	63.76	0.47	1½	12,763	13,114	Thermal	64-20099
81-10	97630	73.8 - 75.3	1.5	18.01	19.39	62.6	0.4	1	11,309	12,451	Thermal	64-20114
	97631	75.3 - 76.8	1.5	9.61	24.22	66.17	0.41	1½	12,798	13,666	Thermal	64-20115
	97632	76.8 - 78.3	1.5	9.79	17.45	72.76	0.41	1½	12,310	13,859	Thermal	64-20116
					SEAM FOUR							
81-5(A)	97874	71.6 - 73.8	2.2	2.1	19.54	78.36	0.46	1½	14,560	15,116	Thermal	64-20013
	97875	73.8 - 75.0	1.2	3.33	23.61	73.06	0.41	6	14,493	14,989	Coking	64-20014
(B)	97876	77.3 - 80.3	3.0	4.15	22.7	73.15	0.43	6½	14,037	14,756	Coking	64-20015
81-4	97857	94.75- 96.6	1.85	4.7	19.54	75.76	0.4	1½	13,807	14,745	Thermal	64-19961
	97858	96.6 - 98.6	2.0	13.87	20.73	65.4	0.48	5	12,545	13,261	Thermal	64-19962
80-3	441	122.3 -126.3	4.0	13.27	20.16	66.57	0.46	1	12,383	13,207	Thermal	64-19915
81-11	97650	69.2 - 70.7	1.5	3.18	20.23	76.59	0.48	1	13,998	15,027	Thermal	64-20134
	97651	70.7 - 73.2	2.5	4.6	20.56	74.84	0.55	3	14,075	14,807	Thermal	64-20135
81-12	97653	21.6 - 23.5	1.9	14.38	19.93	65.69	0.59	1	12,357	12,754	Thermal	64-20137
81-6	97893	128.4 -130.8	2.4	4.47	20.35	75.18	0.54	1	14,214	14,837	Thermal	64-20051
	97894	130.8 -132.1	1.3	2.2	20.8	77.0	0.58	2	14,674	15,101	Thermal	64-20052
81-10	97633	98.5 -100.0	1.5	9.11	21.88	69.01	0.59	7½	12,892	13,545	Coking	64-20117
					SEAM FIVE							
81-5(A)	97878	168.9 -170.6	1.7	17.23	15.72	67.05	0.67	1	12,450	12,790	Thermal	64-20017
(B)	97879	171.4 -172.2	0.8	5.29	17.19	77.52	0.91	1	14,271	14,666	Thermal	64-20018
81-4(A)	97862	192.2 -193.4	1.2	3.53	17.95	78.52	0.73	1	14,666	15,027	Thermal	64-19966
(B)	97863	193.9 -194.4	0.5	12.89	17.05	70.06	0.75	1½	13,134	13,482	Thermal	64-19967
81-7(A)	97601	12.4 - 12.95	0.55	5.56	16.94	77.5	0.81	1½	14,010	14,490	Thermal	64-20064
(B)	97602	13.6 - 14.4	0.8	7.05	16.08	76.87	0.77	1	13,910	14,406	Thermal	64-20065
80-3	443	248.0 -249.0	1.0	11.46	17.28	71.26	0.64	1	12,973	13,603	Thermal	64-19917
	444	249.0 -249.9	0.9	10.48	18.01	71.51	0.7	1	13,953	14,390	Thermal	64-19918
80-2	416	42.2 - 43.0	0.8	50.98	10.72	28.3	0.26	½	4,540	4,809	Thermal	64-19890
	417	43.0 - 43.55	0.55	2.42	16.35	81.23	0.62	1	14,285	15,086	Thermal	64-19891
	418	43.55- 43.8	0.25	13.38	15.72	70.9	0.56	1	13,215	13,789	Thermal	64-19892
	419	43.8 - 44.1	0.3	5.65	18.64	75.71	0.68	3	14,260	14,653	Thermal	64-19893
	420	44.1 - 44.3	0.2	67.79	8.32	23.89	0.34	½	4,253	4,417	Waste	64-19894
	421	44.3 - 45.2	0.9	4.66	16.25	79.09	0.62	1	13,902	14,843	Thermal	64-19895

TABLE 5

SUMMARY OF COAL QUALITY

Location D.D.H.	Sample No.	Interval (m)	Width (m)	Ash	Volatile Matter % Values	Fixed Carbon Dry Assay	Sulphur	F.S.I.	B.T.U. (Moist)	B.T.U. (Dry)	Type	Analysis Report No.
					SEAM FIVE .. continued							
81-6	97895	237.7 -238.4	0.7	18.72	25.97	55.31	0.5	0	7,058	7,285	Waste	64-20053
	97896	238.4 -240.1	1.7	4.14	17.53	78.33	0.65	1	14,325	14,817	Thermal	64-20054
81-9	97622	209.5 -210.2	0.7	13.05	16.78	70.17	0.76	1	12,729	13,351	Thermal	64-20100
81-10	97637	210.0 -211.2	1.2	3.04	17.31	79.65	0.64	1	14,395	15,048	Thermal	64-20121
	97638	211.2 -213.1	1.9	25.87	15.15	58.98	0.47	1	10,754	11,103	Thermal	64-20122
	97639	213.1 -214.3	1.2	8.10	17.75	74.15	0.61	1	14,860	15,770	Thermal	64-20123
	20											
					SEAM SIX							
81-5	97880	193.2 -194.1	0.9	3.52	15.48	81.0	0.63	½	14,334	14,786	Thermal	64-20019
	97881	194.1 -196.65	2.55	37.85	15.03	47.12	0.59	1	10,849	11,089	Thermal	64-20020
81-8	97611	28.6 - 29.6	1.0	2.58	15.24	82.18	0.57	0	14,314	15,060	Thermal	64-20089
	97612	29.6 - 31.1	1.5	8.12	15.34	76.56	0.5	0	13,039	13,775	Thermal	64-20090
	97613	31.1 - 31.7	0.6	4.68	18.04	77.28	0.6	0	13,833	14,491	Thermal	64-20091
81-4	97864	217.85-218.5	0.65	2.3	16.47	81.23	0.71	0	14,680	15,104	Thermal	64-19968
	97865	218.5 -220.3	1.8	3.49	18.27	78.24	0.64	1	14,368	14,752	Thermal	64-19969
81-7	97603	38.1 - 39.9	1.8	3.75	15.85	80.4	0.55	1½	14,339	14,957	Thermal	64-20066
	97604	39.9 - 41.1	1.2	4.03	16.07	79.9	0.67	1	14,386	14,975	Thermal	64-20067
80-3	446	268.8 -269.1	0.3	12.41	15.03	72.56	0.61	0	12,879	13,360	Thermal	64-19920
	447	269.1 -270.4	1.3	1.91	15.68	82.41	0.58	0	14,547	15,166	Thermal	64-19921
	448	270.4 -270.7	0.3	2.63	16.43	80.94	0.57	0	14,424	15,036	Thermal	64-19922
	449	270.7 -272.3	1.6	2.15	16.61	81.24	0.66	1	14,368	15,191	Thermal	64-19923
80-2	424	61.0 - 62.3	1.3	2.44	16.41	81.15	0.54	½	14,411	15,008	Thermal	64-19898
	425	62.3 - 63.9	1.6	1.7	16.67	81.63	0.57	1	14,573	15,239	Thermal	64-19899
	426	63.9 - 64.2	0.3	15.23	16.47	68.3	0.56	2	13,042	13,311	Thermal	64-19900
80-1	404	25.0 - 27.4	2.4	4.1	15.61	80.29	0.54	½	14,601	14,863	Thermal	64-19878
81-6	97898	255.7 -256.6	0.9	3.08	16.43	80.49	0.6	0	14,538	15,050	Thermal	64-20056
	97899	256.6 -258.2	1.6	2.17	17.29	80.54	0.67	1	14,790	15,247	Thermal	64-20057
81-9	97623	220.7 -222.5	1.8	16.92	24.21	58.87	0.53	1	11,435	12,555	Thermal	64-20101
81-10	97640	229.05-231.25	2.2	7.03	20.54	72.43	0.63	1	13,664	14,224	Thermal	64-20124
	21											
					SEAM SEVEN							
81-5	97882	236.75-238.4	1.65	38.72	14.83	46.45	0.4	1	9,022	9,178	Thermal	64-20021
	97883	238.4 -239.5	1.1	2.62	16.05	81.33	0.56	½	14,776	15,169	Thermal	64-20022
	97884	240.0 -241.4	1.4	13.37	16.32	70.31	0.66	1	12,983	13,464	Thermal	64-20023
	97885	241.4 -242.2	0.8	2.39	17.36	80.25	0.72	1½	14,501	15,242	Thermal	64-20024
81-8(A)	97614	63.2 - 64.8	1.6	8.31	15.98	75.71	0.62	1½	13,974	14,312	Thermal	64-20092
(B)	97615	65.3 - 66.15	0.85	5.42	15.67	78.91	0.67	1	14,260	14,644	Thermal	64-20093
(C)	97616	67.9 - 69.45	1.55	7.45	16.8	75.75	1.1	1	14,147	14,462	Thermal	64-20094
81-4	97866	259.1 -259.7	0.6	7.1	14.83	78.07	0.6	0	14,022	14,413	Thermal	64-19970
	97867	259.7 -261.2	1.5	5.56	15.84	78.6	0.52	1	14,155	14,737	Thermal	64-19971
	97868	261.2 -262.7	1.5	2.14	15.9	81.96	0.53	0	14,725	15,195	Thermal	64-19972
	07869	262.7 -264.05	1.35	22.71	14.23	63.06	0.63	0	11,552	11,896	Thermal	64-19973
81-7(A)	97605	74.7 - 76.7	2.0	13.38	14.51	72.11	0.44	1	12,995	13,498	Thermal	64-20068
(B)	97606	76.9 - 77.3	0.4	25.54	13.95	60.51	0.58	0	11,074	11,209	Thermal	64-20069
(C)	97607	78.6 - 80.6	2.0	6.39	15.91	77.7	0.78	1	13,971	14,390	Thermal	64-20070
80-3	450	310.8 -311.5	0.7	5.11	14.82	80.07	0.5	0	13,786	14,575	Thermal	64-19924
	451	311.5 -312.2	0.7	2.38	15.07	82.55	0.42	0	14,190	15,096	Thermal	64-19925
	452	312.2 -313.0	0.8	2.41	16.25	81.34	0.39	1½	14,620	15,220	Thermal	64-19926
	453	313.0 -314.6	1.6	25.2	13.39	61.41	0.34	½	10,762	11,155	Thermal	64-19927
	454	315.0 -316.3	1.3	3.02	15.54	81.44	0.59	1	14,420	14,968	Thermal	64-19928
80-2	427	126.0 -126.7	0.7	7.33	17.05	75.62	0.7	1½	14,111	14,415	Thermal	64-19901
	428	127.2 -128.7	1.5	2.02	42.75	55.23	0.47	0	14,656	15,102	Thermal	64-19902
	429	128.7 -129.4	0.7	2.01	16.41	81.58	0.47	0	14,737	15,133	Thermal	64-19903
	430	129.5 -130.8	1.3	1.75	16.09	82.16	0.45	1	14,439	14,886	Thermal	64-19904
80-1	405	71.2 - 71.9	0.7	1.49	16.61	81.9	0.64	1	15,029	15,356	Thermal	64-19879
	406	72.5 - 74.1	1.6	4.53	16.59	78.88	0.49	1	14,212	14,783	Thermal	64-19880
	407	74.4 - 75.6	1.2	3.39	15.61	81.0	0.51	½	14,168	15,031	Thermal	64-19881
	408	77.0 - 78.4	1.4	2.96	16.63	80.41	0.72	1½	14,321	15,040	Thermal	64-19882
	409	74.1 - 74.4	0.3	62.55	9.96	27.49	0.25	½	4,178	4,368	Waste	64-19883
81-6	97901	290.2 -291.7	1.5	2.12	15.73	82.15	0.4	0	14,590	15,094	Thermal	64-20059
	97902	291.7 -293.2	1.5	20.05	15.53	64.42	0.37	1	10,653	11,648	Thermal	64-20060
	97903	293.2 -294.1	0.9	29.16	14.35	56.49	0.5	0	10,277	10,999	Thermal	64-20061
	97904	294.2 -294.8	0.6	9.39	23.25	67.36	0.64	1	13,662	14,150	Thermal	64-20062
	97905	294.95-295.9	0.95	4.4	15.97	79.63	0.48	1	13,906	14,811	Thermal	64-20063
81-5	97624	265.5 -267.5	2.0	6.03	16.84	77.13	0.38	1	13,593	14,389	Thermal	64-20102
	97625	267.7 -268.0	0.7	4.11	16.54	79.35	0.45	1	14,063	14,867	Thermal	64-20103
	97626	269.2 -270.85	1.65	2.07	16.33	81.6	0.57	1	14,849	15,315	Thermal	64-20104
81-10(A)	97641	263.6 -264.3	0.7	2.19	19.34	78.47	0.99	1	14,904	15,193	Thermal	64-20125
	97642	264.3 -267.25	2.9	3.4	17.88	78.72	1.42	1	14,305	14,899	Thermal	64-20126
(B)	97643	273.4 -274.75	1.35	3.66	16.61	79.73	0.76	1	14,247	14,926	Thermal	64-20127

TABLE 5

SUMMARY OF COAL QUALITY

Location D.D.H.	Sample No.	Interval (m)	Width (m)	Ash	Volatile Matter % Values	Fixed Carbon – Dry Assay	Sulphur	F.S.I.	B.T.U. (Moist)	B.T.U. (Dry)	Type	Analysis Report No.
					SEAM EIGHT							
81-5	97886	272.3 -273.4	1.1	27.51	14.45	58.04	0.74	1	10,771	11,017	Thermal	64-20025
81-8	97617	93.8 - 94.4	0.6	8.91	16.42	74.67	1.03	1½	13,741	13,999	Thermal	64-20095
81-7	97608	105.75-107.05	1.3	11.44	15.57	72.99	0.91	1	13,263	13,571	Thermal	64-20071
80-3	456	334.1 -334.9	0.8	4.29	15.92	79.79	0.79	1	14,494	14,889	Thermal	64-19953
	457	334.9 -335.6	0.7	69.6	9.12	21.28	0.37	½	3,701	3,820	Waste	64-19954
80-2	435	161.1 -162.0	0.9	3.6	16.1	80.3	0.75	1	14,498	14,897	Thermal	64-19909
	436	162.0 -163.7	1.7	25.38	14.64	59.98	0.65	1	10,820	11,119	Thermal	64-19910
80-1	410	115.0 -115.4	0.4	78.98	8.79	12.23	0.69	½	2,299	2,374	Waste	64-19884
	411	115.4 -116.4	1.0	26.03	12.54	61.43	0.7	½	10,711	11,064	Thermal	64-19885
	412	116.4 -117.0	0.6	33.11	14.54	52.35	1.42	1	9,371	9,740	Thermal	64-19886
	413	117.0 -117.9	0.9	76.75	8.73	14.52	1.47	½	2,856	2,943	Waste	64-19887

TABLE 6

TOTAL RESOURCES - CALCULATIONS

Coal Seam	Strike Length From	Strike Length To	Total	Dip-Length	Ave. Width	S:G:	Tonnes
1							
Indicated a	700N	1200S	1900m	250m	3.1m	1.3	1,914,250
Inferred b	"	"	1900m	600m	3.1m	1.3	4,594,200
Inferred c	700N	900N	200m	800m	3.1m	1.3	644,800
2							
Indicated a	700N	1200S	1900m	300m	2.0m	1.3	1,482,000
Inferred b	"	"	1900m	550m	2.0m	1.3	2,717,000
Inferred c	700N	1000N	300m	800m	2.0m	1.3	624,000
3							
Indicated a	200N	1200S	1400m	300m	3.2m	1.3	1,747,200
Inferred b	"	"	1400m	550m	3.2m	1.3	3,203,200
Inferred c	Nil	-	-	-	-	-	-
4							
Indicated a	700N	1200S	1900m	350m	3.6m	1.3	3,112,200
Inferred b	"	"	1900m	550m	3.6m	1.3	4,890,600
Inferred c	700N	1200N	500m	800m	3.6m	1.3	1,872,000
5							
Indicated a	700N	400S	1100m	650m	2.2m	1.3	2,044,900
Inferred b	"	"	1100m	400m	2.2m	1.3	1,258,400
Inferred c	700N	1400N	700m	900m	2.2m	1.3	1,801,800
6							
Indicated a	700N	400S	1100m	700m	2.3m	1.3	2,302,300
Inferred b	"	"	1100m	250m	2.3m	1.3	822,250
Inferred c	700N	1500N	800m	900m	2.3m	1.3	2,152,800
7							
Indicated a	700N	400S	1100m	850m	4.1m	1.3	4,983,550
Inferred b	"	"	1100m	150m	4.1m	1.3	879,450
Inferred c	700N	1600N	900m	900m	4.1m	1.3	4,317,300
8							
Indicated	700N	200S	900m	450m	1.5m	1.3	789,750
Inferred	-	-	-	-	-	-	-

Total Indicated	18.4 million tonnes
Total Inferred	33 " "

Coal Resources

The Bumines and U.S.G.S. definition and classification scheme for Total Resources was used for resource calculations (Appendix I). Table 6 illustrates the figures used to determine the indicated, inferred and hypothetical resources (Figure 16).

For each cross section the total quantity of coal was measured and recorded at each coal zone intersection (Table 4). The average width was then calculated from the various data points for that seam. The average width for the seam for that section was then averaged with the other section averages to get an overall average for one seam.

A specific gravity of 1.3 was used from sidewall densilog data.

Total Resources

Resources Indicated	18.4	million tonnes
Resources Inferred	33	million tonnes
Hypothetical Resources (untested)	24	million tonnes

CONCLUSIONS

From the trenching and diamond drilling completed to, date, eight major coal zones have been identified. Sampling indicates the coal to be mainly of a low to moderate volatile bitumimous quality with a very low ash content and averages 14,000 BTU's and 0.6% sulphur.

The mapping of outcrops, roadcuts, trench exposures together with the limited diamond drill holes indicate 18.4 million tonnes of coal resources and infer 33 million tonnes as well.

Hypothetical untested seam project, suggests that there could be 24 million tonnes to the southern property limits as well.

Recommendations

A two-part second phase program is recommended. (Fig.17).

Part II (A)

1. Establish a permanent bridge crossing over the Pine River.
2. Establish a trailer camp on the property.
3. Contract McElhanney to fly the area and prepare good quality base maps.
4. Upgrade and extend the existing ground survey
   - North to the railroad tracks
   - East to 1500 East
   - South to the property boundary 2500S
5. Legal survey of property boundary
6. Diamond drill holes at 200 m spacings north from 81-5 to determine quality and extent of principal coal zones to the north.
7. Daylight principal seams for adit sites and bulk sampling with backhoe.

Part II (B)

1. Do additional infill drilling to improve geological confidence and spacing between the few holes drilled in the previous program.
2. Diamond drill deeper holes to the east to determine the character, quality and depth extent of the easterly dipping coal zones.
3. Drive adits and bulk sample the major coal seams.

A.S. MARTON, B.Sc.

Vancouver, B.C.
May 31, 1981

Phase II (A)

Bridge to cross Pine River	$ 100,000.00
McElhanney - Air & ground survey	35,000.00
Diamond Drilling - 5400 m HQ @ $130/m	702,000.00
Bulldozing - Road work, drill site prep., moving 2 rigs D7 @ $80/hr. 45 days	36,000.00
Backhoeing - Trenching, roadcuts, reclamation 4 weeks @ $50/hr.	15,500.00
Assaying - core samples shipping 300 x $50	15,000.00
Swampers - $110/day x 4 x 45 days	19,800.00
Cook - 2 mo. x $2,500/mo.	5,000.00
Roke Geophysical - $25,000/mo. x 1.5 mo.	37,500.00
Vehicles (2) - $2,000/mo. x 2 mo. x 2 vehicles	8,000.00
Helicopter	10,000.00
Geology, Engineering & Supervision - 1 @ $300/day; 1 @ $200/day x 2 mo.	31,000.00
Camp - $10,000/mo. x 2 mo.	20,000.00
Travel	3,000.00
Data compilation, reports, drafting	15,000.00
Shipping core to core library	5,000.00
	$1,057,800.00
Contingencies @ 15%	158,670.00
	$1,216,470.00

Phase II (B)

Diamond drilling - 3400 m HQ x $130/m	$ 442,000.00
Driving Sampling Adits 5 x 20 m = 100 m @ $600/m x 100 m	60,000.00
Bulldozing - Roadwork, drill site prep., moving 2 rigs D7 @ $80/hr. 45 days	36,000.00
Assaying - Core and bulk samples, includes shipping, 400 x $50	20,000.00
Swampers - $110/day x 2 x 45 days	9,900.00
Cook - 2 mo. x $2,500/mo.	5,000.00
Roke Geophysical - $25,000/mo. x 1 mo.	25,000.00
Vehicles (2) - $2000/mo. x 2 mo. x 2 vehicles	8,000.00
Helicopter	5,000.00
Geology, engineering & supervision - 1 @ $300/day; 1 @ $200/day x 2 mo.	31,000.00
Camp - $10,000/mo. x 2 mo.	20,000.00
Travel	3,000.00
Data compilation, report, drafting	10,000.00
Shipping core to core library	5,000.00
	$ 651,900.00
Contingencies @ 15%	97,785.00
	$ 749,685.00

Vancouver, B.C.
May 31, 1981

A.S. MARTON, B.Sc.

REFERENCES

BU Mines, Survey Revise Definitions of Mineral Terms; Geotimes, September, 1974.

Coal Task Force (1976): Coal in B.C.; A Technical Appraisal

Edwards, K.W. and Banks, K.M. 1977: A Theoretical Approach to the Evaluation of Insitu Coal; paper presented at 6th Formation Evaluation Symposium of the Canadian Well Logging Society, Calgary.

Emkay Canada Natural Resources Ltd., Scurry-Rainbow Oil Limited (1971); Elk River Coal

Gibson, D.W. (1972): Triassic Stratigraphy of the Pine Pass - Smoky River Area, Rocky Mountain Foothills and Front Ranges of B.C. and Alberta; G.S.C. Paper 71-30.

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; Liard Mining Division, Assessment Report.

Jones, H.M. (1980): Assessment Report on the Geological Mapping Program on Parts of Coal Licences 3986-3993 inclusive; Liard Mining Division.

Jones, H.M. (1981): Progress Report of work performed on Coal Licences 3986-3993 inclusive, Pine River Area, Liard Mining Division.

Keys, W.S. and MacLary, L.M. (1971): Application of Borehole Geophysics to Water-Resources Investigations. Collection of Environmental Data Book 2 U.S.G.S. Techniques of Water-Resources Investigations.

McLearn, F.H. and Kindle, E.D. (1950): Geology of Northeastern British Columbia; Geol. Surv. Can., Mem.259.

REFERENCES .. continued

McKechnie, N.D. (1955): Coal reserves of the Hasler Creek-Pine River Area; B.C. Dept. of Mines, Bull.No.36.

Ministry of Economic Development, Province of B.C.; B.C. Coal Development.

Morris, D.W. (1975): Formation Evaluation using Geophysical Drill Logs: A General Approach in Canadian Well Logging Society Journal; Vol.8, No.1 pp 85-96.

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, A.S. Marton, of the City of Vancouver, British Columbia, do hereby certify that:

1. I am a consulting geologist with G.A. Noel & Associates, Inc., 622-510 West Hastings Street, Vancouver, B.C.

2. I am a graduate of the University of British Columbia and have been granted the degree of Bachelor of Science in Geology.

3. I have been practising my profession as an Exploration Geologist for 8 years in British Columbia, Yukon, Alaska, Washington, Idaho and Australia.

4. This report is based on six months of fieldwork, which I personally supervised, on the Willow Creek Coal property, during 1980-1981.

5. I have no interest, nor do I expect to receive any interest, direct or indirect in coal licences 3986-3993 and 6792 or in any securities of Semper Resources Inc.

6. Semper Resources Inc. is hereby given permission to reproduce this report, or any part of it, for financing purposes; 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.

Vancouver, B.C.
May 31, 1981

A.S. MARTON, B.Sc.

CERTIFICATE

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

1. I am a consulting geological engineer with G.A. Noel & Associates, Inc., 622-510 West Hastings Street, Vancouver, B.C.

2. I am a graduate of the University of British Columbia in Geological Engineering, 1956.

3. I have been practising my profession as a geological engineer for 25 years.

4. I am a member of the Association of Professional Engineers of British Columbia, Registration No.4681.

5. I am familiar with coal licences 3986-3993 and 6792 having conducted geological mapping and backhoe trenching programs on the licences during 1979 and 1980. I also consulted on the recently completed trenching and drilling program and reviewed all the data from this work.

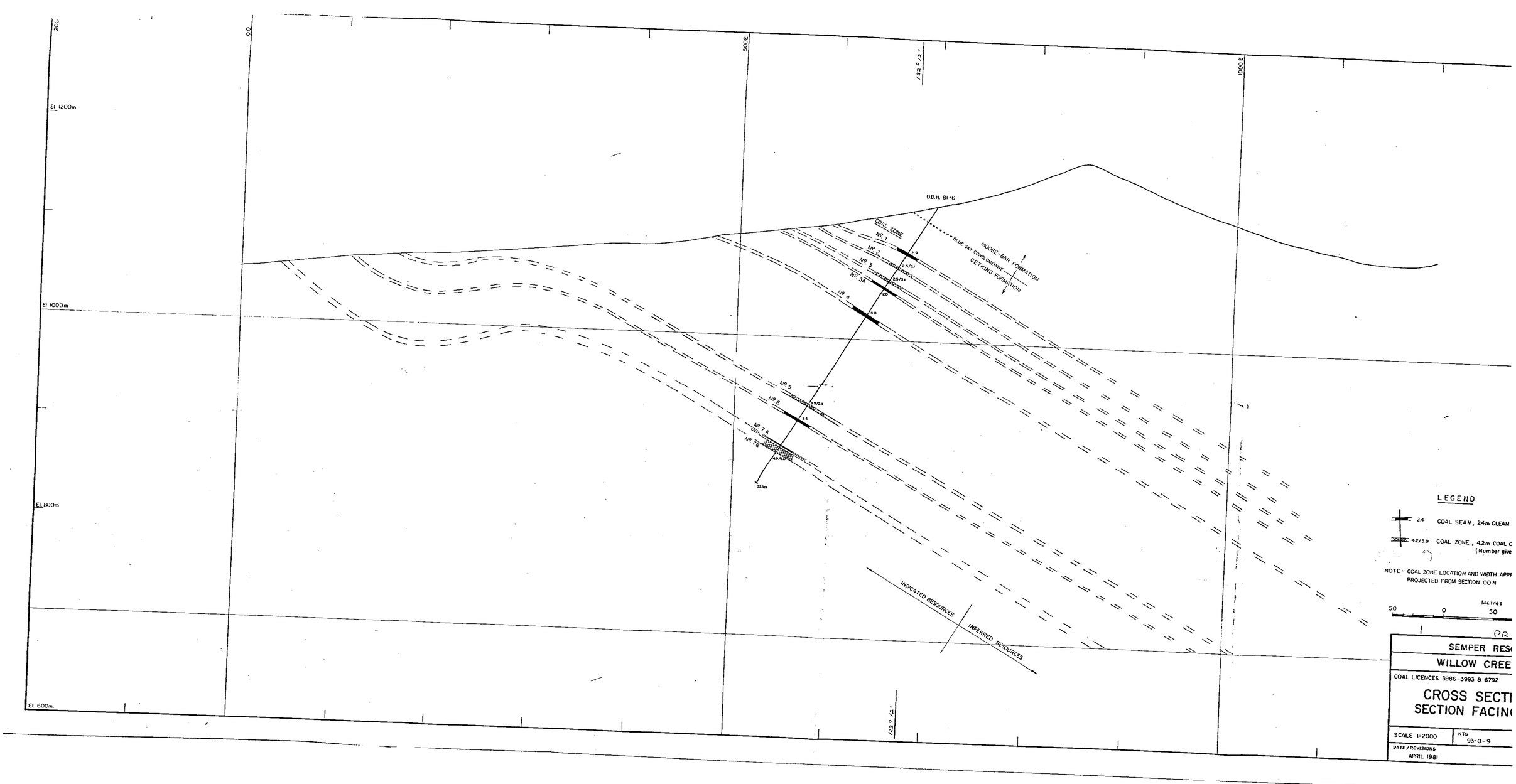
6. I have no interest, nor do I expect to receive any interest, direct or indirect in coal licences 3986-3993 and 6792 or in any securities of Semper Resources Inc.

7. Semper Resources Inc. is hereby given permission to reproduce this report, or any part of it, for financing purposes; 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 31st day of May, 1981.

Harold M. Jones

HAROLD M. JONES, P.Eng.


200
00
300E
1000E
El. 1200m
El. 1000m
El. 800m
El. 600m
D.D.H. 81-6
COAL ZONE
No. 1
No. 2
No. 3
No. 3A
No. 4
No. 5
No. 6
No. 7A
No. 7B
2.9
2.5/3.1
2.5/3.1
3.2
4.0
1.8/2.1
2.4
4.8/5.2
323m
BLUE SKY CONGLOMERATE
MOOSE-BAR FORMATION
GETHING FORMATION
INDICATED RESOURCES
INFERRED RESOURCES
LEGEND
2.4 COAL SEAM, 2.4m CLEAN
4.2/5.9 COAL ZONE, 4.2m COAL
(Number give
NOTE: COAL ZONE LOCATION AND WIDTH APPR
PROJECTED FROM SECTION 00 N
Metres
50 0 50
PR-
SEMPER RES
WILLOW CREE
COAL LICENCES 3986-3993 & 6792
CROSS SECTI
SECTION FACIN
SCALE 1:2000
NTS
93-O-9
DATE/REVISIONS
APRIL 1981

600 N
400 N
00
200 S
600 S
1000 S
D.D.H. 81-5
D.D.H. 81-4
D.D.H. 80-3
D.D.H. 81-6
D.D.H. 81-9
D.D.H. 81-10
D.D.H. 81-11
D.D.H. 81-12
D.D.H. 80-2
D.D.H. 81-7
D.D.H. 81-8
D.D.H. 80-1
COAL ZONE
MARCASITE GLAUCONITE
MOOSE BAR FORMATION
BLUE SKY CONGLOMERATE
GETHING FORMATION
Coal Thickness
GETHING FORMATION
CADOMIN FORMATION ?
SCALE - METRES
LEGEND
COAL
SANDSTONE
MUDSTONE, SHALE
CONGLOMERATE
SEMPER RESOURCES INC.
WILLOW CREEK PROJECT
COAL LICENCES 3986-3993 & 6792
PROPERTY STRATIGRAPHIC COLUMN CORRELATION CHART
SCALE Hor. 1:2000 Ver. 1:1000
NTS 93-O-9
DATE / REVISIONS APRIL 1981
WORK BY G.A. NOEL & ASSOCIATES

Figure 14

C.L. 3989

PROPOSED ADIT LOCATION APPROX.

B.C. RAIL

New road construction

PINE RIVER

55° 37'

C.L. 3993
C.L. 3992 C.L. 3991

New road construction

300m -60°

600m -60°

350m -60°

81-5

WRA 118

81-4

TRENCH 10

WRA 115

80-3

81-8

81-7

TRENCH 9

81-11

81-6 also approx. loc. of old hole

81-12

TRENCH 5B

TRENCH 8

TRENCH 7

TRENCH 6A

80-1

80-2

TRENCH 6

TRENCH 5

ROAD CUT No. 3

ROAD CUT No. 4

81-9

WRA 92

Old hole loc. approx.

81-10

55° 36'

C.L. 3988
C.L. 3987

C.L. 6792

C.L. 3992 C.L. 3991
C.L. 3990

TRENCH 5A

WRA 82

Dam - drill water

TRENCH No. 3

TRENCH No. 2

TRENCH No. 4

ROAD CUT No. 2

ROAD CUT No. 1

TRENCH No. 1

CAPPED NATURAL GAS WELL
HUNT SANDS SUN FALLS C-18-G

DETAIL MAP AREA - Scale 1:2000

Road Reopened

55° 35'

C.L. 3987
C.L. 3986

CONTOURS INTERVAL 20m and 40m.
BASE MAP BY PACIFIC SURVEY CORP., JULY 1978

LEGEND

- 80-2 — COLLAR - DIAMOND DRILL HOLE
- TRENCH 7 — BACK HOE TRENCH
- WRA 82 — REOPENED OLD BCDM TRENCH
- ACCESS ROAD
- DAM FOR DRILL WATER
- PROPOSED ADIT

PROPOSED DIAMOND DRILL HOLES

- ○ PHASE II A (16 HOLES)
- □ PHASE II B (10 HOLES)

PR-Willow Creek 80(2)A*(1)

SEMPER RESOURCES INC.

WILLOW CREEK PROJECT

14.6 million
Inferred

18.4 million
Inferred

18.4 million
Indicated

24.3 million
Hypothetical

PINE RIVER

B.C. RAIL

TRENCH Nº. 1
TRENCH Nº. 2
TRENCH Nº. 3
TRENCH Nº. 4
ROAD CUT Nº. 1
ROAD CUT Nº. 2
ROAD CUT Nº. 3
ROAD CUT Nº. 4
TRENCH 5A
TRENCH 5B
TRENCH 6
TRENCH 6A
TRENCH 7
TRENCH 8
TRENCH 9
TRENCH 10
WRA 82
WRA 115
WRA 116
Old hole loc. approx
Dam or lake
CAPPED NATURAL GAS WELL
HUNT SANDS SUN FALLS C-18-G

DETAIL MAP AREA - Scale 1:2000

C.L. 3993
C.L. 3992
C.L. 3991
C.L. 6792
C.L. 3988
C.L. 3987
C.L. 3987
C.L. 3986

55° 37'
55° 36'
55° 35'
122° 12'

CUT LINE

CONTOURS INTERVAL 20m and 80m
BASE MAP BY PACIFIC SURVEY CORP., JULY 1979

LEGEND

- 80-2 — COLLAR - DIAMOND DRILL HOLE
- TRENCH 7 — BACK HOE TRENCH
- WRA 82 — REOPENED OLD BCDM TRENCH
- ---- ACCESS ROAD
- DAM FOR DRILL WATER

PR-Willow Creek 80(3)A *(1)

SEMPER RESOURCES INC.

WILLOW CREEK PROJECT

COAL LICENCES 3986-3993 & 6792

COAL RESOURCES (8 COAL ZONES)

SCALE 1:10,000	NTS 93-O-9	DWG. NO	
DATE/REVISIONS AUG. 1980 / APRIL 1981		DWG. BY	WORK BY G.A. HOEL & ASSOCIATES

Figure 16

COAL ZONE Nº. 2

COAL ZONE Nº. 1

COAL ZONE Nº. 7

COAL ZONE Nº. 6

COAL ZONE Nº. 5

COAL ZONE Nº. 4

COAL ZONE Nº. 3

COAL ZONE Nº. 8

1000

1100

1200

DDH 81-8 (-57°)

DDH 81-5 (-65°)

DDH 81-7 (-58°)

DDH 81-4 (-62°)

DDH 80-1 (-55°)

DDH 80-2 (-90°)

DDH 81-12 (-57°)

DDH 81-11 (-55°)

DDH 80-3 (-60°)

DDH 81-6 (-60°), DDH 38 (approx. loc.)

DDH 81-9 (-59°)

DDH 81-10 (-58°)

TR. 8

TR. 7

TR. 6

TRENCH 6A

TR. 5A

TR. 5

TR. 5B

500 N

500 S

1000 S

00E

200W

200E

400E

600E

X Drill water

To Dam for Drill Water

BLUESKY CONGLOMERATE

122°13'

55°36'

122°12'

G.N.

T.N.

M.N.

45°

27°

COAL SURFACE TRACE

OUTCROP FROM TRENCH OR ROAD-CUT

DIAMOND DRILL HOLE PROJECTION

CONSTRUCTION ONLY

Metres

100 60 0 100 200

PR: Willow Creek 82(2)A *(1)

SEMPER RESOURCES INC.

WILLOW CREEK PROJECT

COAL LICENCE: 3986 - 3993 & 6792

COAL ZONES Nº. 1-8
SURFACE TRACE: OBSERVED, PROJECTED

SCALE 1:2000	NTS 93-O-9	DWG NO.	
DATE / REVISIONS APRIL 1981		DWG BY	WORK BY G.A. NOEL & ASSOCIATES


200 W
00
500E
1000 E
122° 12'
El 1200m
El 1000m
El 800m
El 600m
D.D.H. 81-9
COAL ZONE
Nº 1
Nº 2
Nº 3
Nº 4
Nº 5
Nº 6
Nº 7
MOOSE BAR FORMATION
BLUE SKY CONGLOMERATE
GETHING FORMATION
INDICATED RESOURCES
INFERRED RESOURCES
STRUCTURE OF COAL ZONES MAY BE SIMILAR TO SECTION 00N - INSUFFICIENT DATA
LEGEND
2.4 COAL SEAM, 2.4m
4.2/5.9 COAL ZONE, 4.2m
NOTE: COAL ZONE LOCATION AND WI
PROJECTED FROM SECTION O
50 0
SEMPER
WILLOW
COAL LICENCES 3986-3993 &
CROSS S
SECTION F
SCALE 1:2000
NTS
DATE / REVISIONS
APRIL 1981

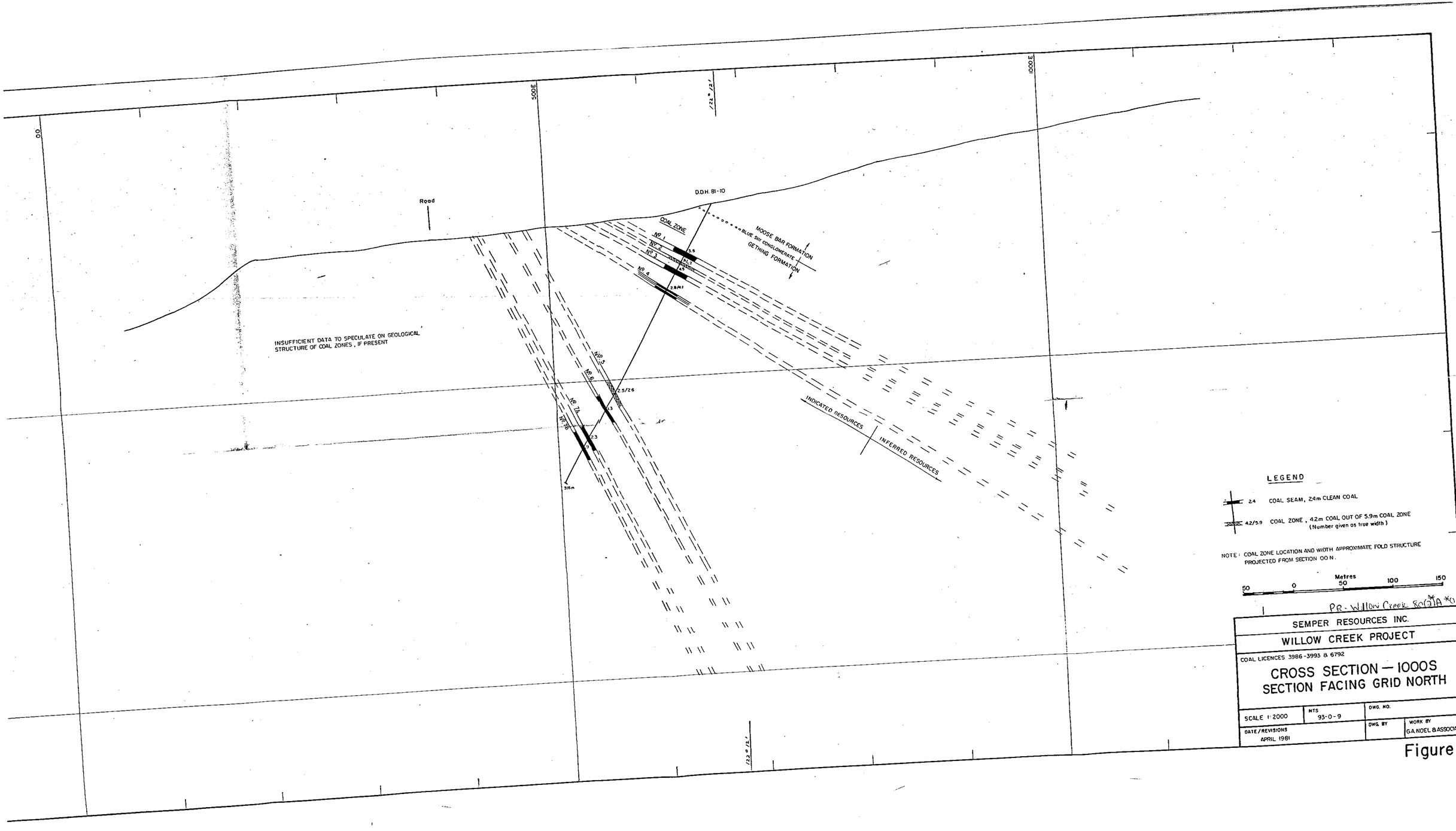

00
500E
1000E
Road
D.D.H. 81-10
COAL ZONE
No 1
No 2
No 3
No 4
5.9
4.2
2.9
MOOSE BAR FORMATION
BLUE SH. CONGLOMERATE
GETHING FORMATION
INSUFFICIENT DATA TO SPECULATE ON GEOLOGICAL STRUCTURE OF COAL ZONES, IF PRESENT
No 5
No 6
No 7A
No 7B
2.5/2.6
2.3
305m
INDICATED RESOURCES
INFERRED RESOURCES
LEGEND
2.4 COAL SEAM, 2.4m CLEAN COAL
4.2/5.9 COAL ZONE, 4.2m COAL OUT OF 5.9m COAL ZONE (Number given as true width)
NOTE: COAL ZONE LOCATION AND WIDTH APPROXIMATE FOLD STRUCTURE PROJECTED FROM SECTION 00 N.
Metres
50 0 50 100 150
PR-Willow Creek 80(3)A #01
SEMPER RESOURCES INC.
WILLOW CREEK PROJECT
COAL LICENCES 3986-3993 & 6792
CROSS SECTION — 1000S
SECTION FACING GRID NORTH
SCALE 1:2000
NTS 93-O-9
DWG. NO.
DATE/REVISIONS APRIL 1981
DWG. BY
WORK BY G.A. NOEL & ASSOCIATES

Figure 12

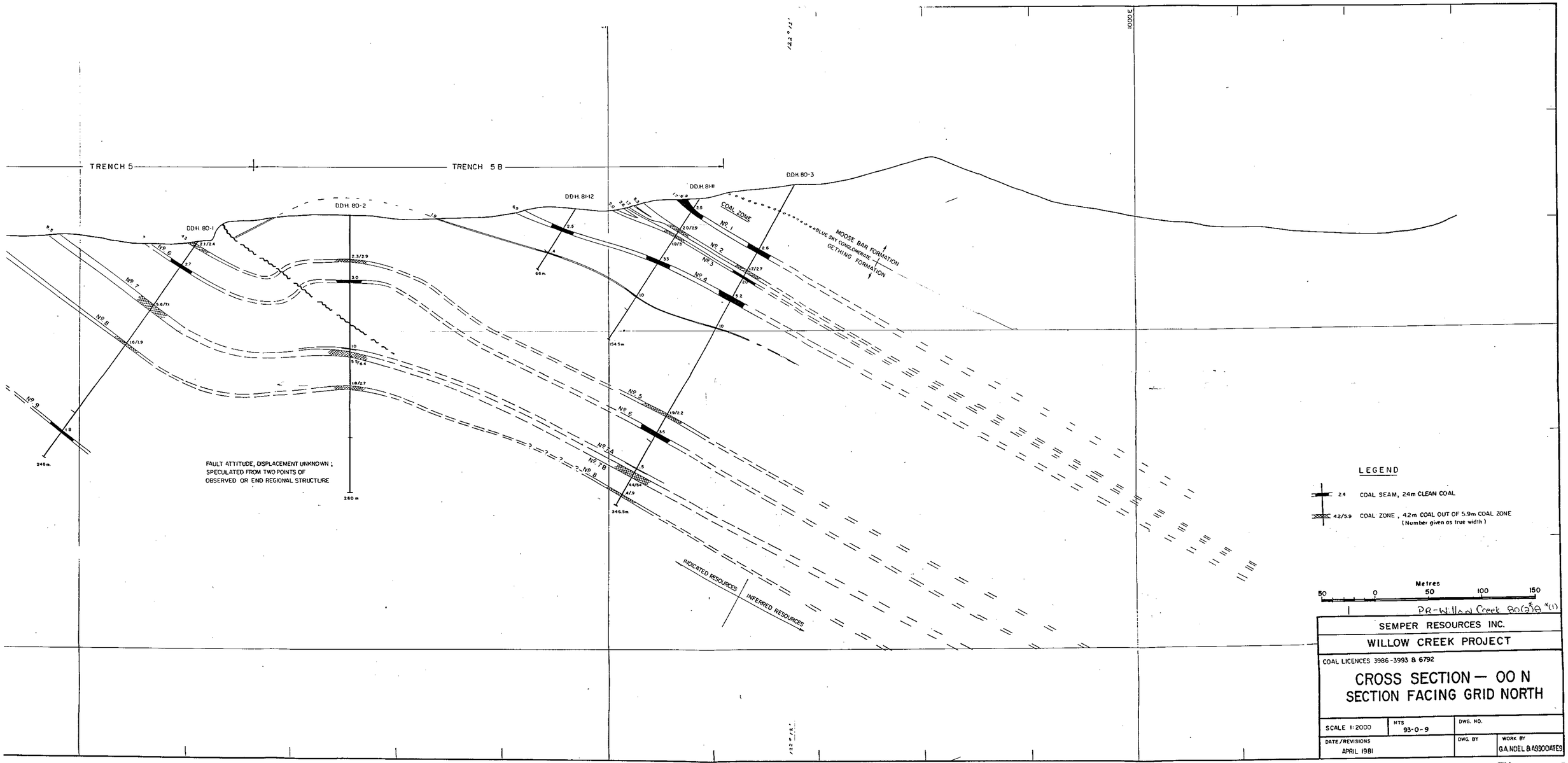
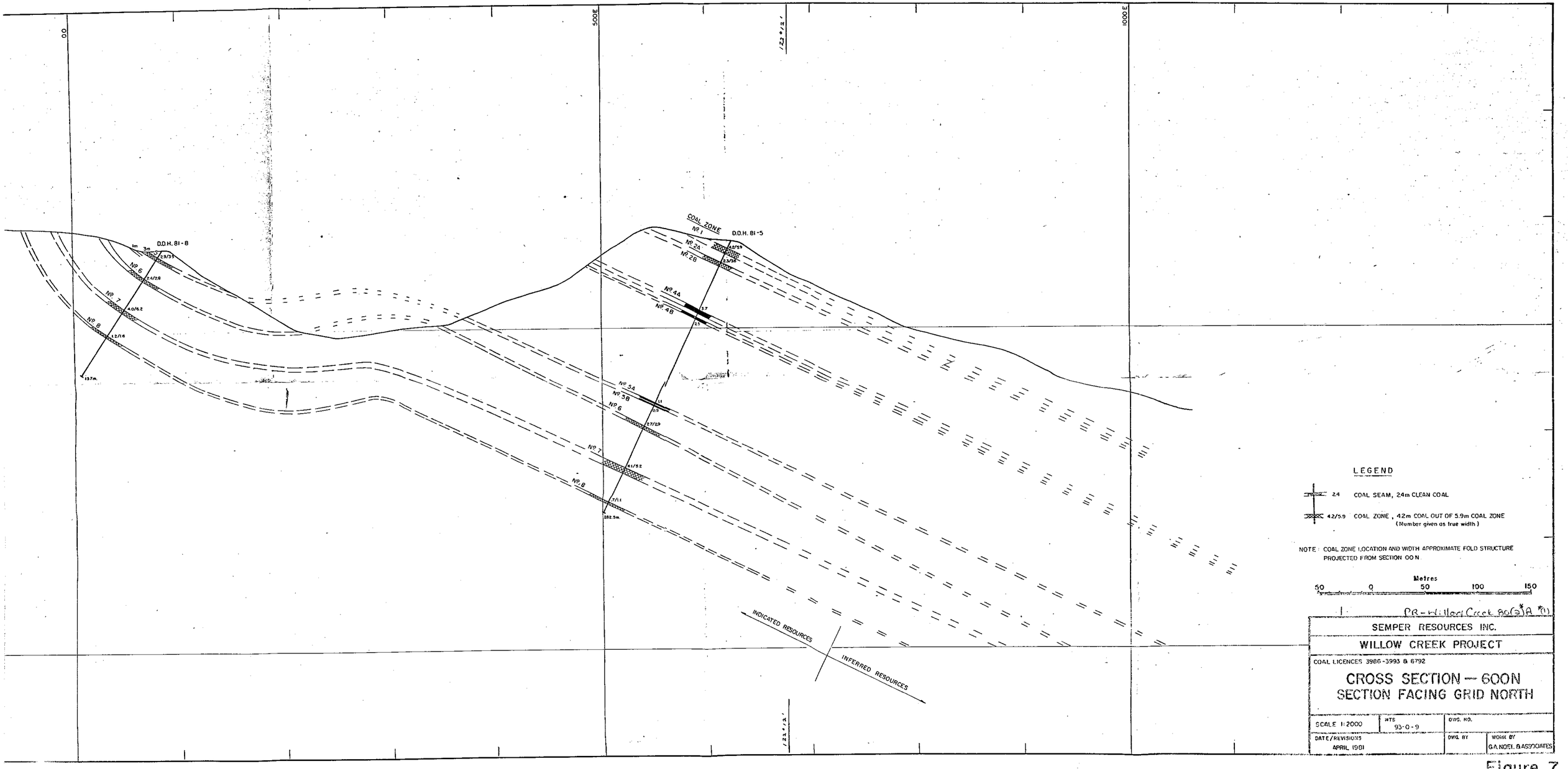

TRENCH 5
TRENCH 5B
DDH 80-1
DDH 80-2
DDH 8H2
DDH 8H1
DDH 80-3
COAL ZONE
Nº 1
Nº 2
Nº 3
Nº 4
Nº 5
Nº 6
Nº 7
Nº 8
Nº 9
Nº 10
Nº 11
Nº 12
Nº 13
Nº 14
Nº 15
Nº 16
Nº 17
Nº 18
MOOSE BAR FORMATION
BLUE SKY CONGLOMERATE
GETHING FORMATION
FAULT ATTITUDE, DISPLACEMENT UNKNOWN ; SPECULATED FROM TWO POINTS OF OBSERVED OR END REGIONAL STRUCTURE
INDICATED RESOURCES
INFERRED RESOURCES
1000 E
122° 12'
LEGEND
2.4 COAL SEAM, 2.4m CLEAN COAL
4.2/5.9 COAL ZONE , 4.2m COAL OUT OF 5.9m COAL ZONE (Number given as true width)
Metres
50 0 50 100 150
PR-Willow Creek 80(3)9 *(1)
SEMPER RESOURCES INC.
WILLOW CREEK PROJECT
COAL LICENCES 3986-3993 & 6792
CROSS SECTION — 00 N
SECTION FACING GRID NORTH
SCALE 1:2000
NTS 93-0-9
DWG. NO.
DATE/REVISIONS APRIL 1981
DWG. BY
WORK BY G.A.NOEL & ASSOCIATES

Figure 9

00
500E
1000E
122°12'
DDH. 81-7
Nº 6
Nº 7A
Nº 7B
Nº 8
Nº 9
2.0/24
2.9
0.9
4.3/5.6
1.7
1.2
CONGLOMERATE
252m.
DDH. 81-4
COAL ZONE
Nº 1
Nº 2
Nº 4
Nº 5
Nº 6
Nº 7
Nº 8
2.7
2.2/3.3
3.8
2.1/3.0
2.6
4.2/5.0
.7/1.5
299m.
INDICATED RESOURCES
INFERRED RESOURCES
LEGEND
2.4 COAL SEAM, 2.4m CLEAN COAL
4.2/5.9 COAL ZONE, 4.2m COAL OUT OF 5.9m COAL ZONE (Number given as true width)
NOTE: COAL ZONE LOCATION AND WIDTH APPROXIMATE FOLD STRUCTURE PROJECTED FROM SECTION 00 N.
Metres
50 0 50 100 150
PR-Willow Creek 80(2)A(1)
SEMPER RESOURCES INC.
WILLOW CREEK PROJECT
COAL LICENCES 3986-3993 & 6792
CROSS SECTION — 400N
SECTION FACING GRID NORTH
SCALE 1:2000
NTS 93-0-9
DWG. NO.
DATE/REVISIONS
APRIL 1981
DWG. BY
WORK BY
G.A. NOEL & ASSOCIATES

Figure 8



LEGEND

24 COAL SEAM, 24m CLEAN COAL

42/59 COAL ZONE, 42m COAL OUT OF 59m COAL ZONE
(Number given as true width)

NOTE: COAL ZONE LOCATION AND WIDTH APPROXIMATE FOLD STRUCTURE PROJECTED FROM SECTION 00 N

Metres
50 0 50 100 150

PR-Willow Creek 80(3)A #1

SEMPER RESOURCES INC.

WILLOW CREEK PROJECT

COAL LICENCES 3986-3993 & 6792

CROSS SECTION — 600N
SECTION FACING GRID NORTH

SCALE 1:2000	NTS 93-O-9	DWG. NO.	
DATE/REVISIONS APRIL 1981		DWG. BY	WORK BY G.A. NOEL & ASSOCIATES

Figure 7

1100
1000
1200
TR. 8
TR. 7
TR. 6
TR. 5A
TR. 5
TR. 5 B
TRENCH 6A
500 N
00
500 S
1000 S
00 E
D.D.H. 81-8 (-57°)
D.D.H. 81-7 (-58°)
D.D.H. 81-5 (-65°)
D.D.H. 81-4 (-62°)
D.D.H. 80-1 (-55°)
D.D.H. 80-2 (-90°)
D.D.H. 81-12 (-57°)
D.D.H. 81-11 (-55°)
D.D.H. 80-3 (-60°)
D.D.H. 81-6 (-60°), D.D.H. 38 (approx. loc.)
D.D.H. 81-9 (-59°)
D.D.H. 81-10 (-58°)
X Drill water
To Dam for Drill Water
65°36'
122°12'
122°13'
G.N.
T.N.
M.N.
45°
27°
Metres
50 0 50 100 150
PR. Willow Creek 80(a)A (1)
SEMPER RESOURCES INC.
WILLOW CREEK PROJECT
COAL LICENCE 1980 3193 & 6792
DETAIL WORK AREA
1980-1981
SCALE 1:2000
NTS 93-O-9
DWG NO.
DATE / REVISIONS
APRIL 1981
DWG BY
G.A. NOEL & ASSOCIATES

Figure 6

8000 N
7000 N
6000 N
5000 N
4000 N
4000 E
5000 E
6000 E
B.L.
GETHING FM.
Blue Sky Conglomerate
MOOSEBAR FM.
APPROX. ADIT COLLARED AT 7500N, 6100 E (Projected from El. 620m.)
Tunnel 166° (true)
Possible tunnel interception coal zone # 7
T7177
T7060
T6960
T6940
T6560
T6500
T6198
T6040
T5976
T5910
T5790
T4320
T3800
T-8
T-7
T-6
81-43
81-45
81-41
81-30
81-26
81-27
81-24
81-28
81-32
81-23
81-34
81-21
81-37
81-35
81-20
81-38
81-18
81-33
81-5
81-7
81-16
81-4
81-31
81-8
81-36
81-13
81-14
81-29
80-1
80-2
81-12
81-11
80-3
81-19
81-40
81-6
81-25
81-42
81-15
81-22
81-44
81-9
81-46
81-17
81-10
Outcrop from roadcut
55°37' 122°13'
55°36' 122°13'
55°37' 122°12'
55°36' 122°12'
3992
3991
3990
MOOSEBAR FORMATION
Blue Sky Conglomerate
GETHING FORMATION
LEGEND
B.L. — Baseline
A — B Coal zone correlation chart section A-B
Fault
Measured coal seam - Surface trace
Indicated coal seam
Inferred coal seam
Adit and tunnel
T3800 Trench
Conglomerate — Outcrop
" — Indicated from drill holes
" — Inferred between section
COAL SEAMS PROJECTED FROM DRILL HOLES UNLESS OTHERWISE INDICATED.
G.N.
T.N.
46°16'41"
0
200 metres
Survey by McElhaney, Nov. 1981 (Preliminary Map)
DAVID MINERALS LIMITED
WILLOW CREEK PROJECT
COAL LICENCES 3986-3993, 6792, 7191 & 7192
GEOLOGY
SCALE 1:5000
NTS 93-O-9
DWG. NO.
DATE REVISIONS
DEC. 1981
DWG. BY
WORK BY G.A. NOEL & ASSOCIATES

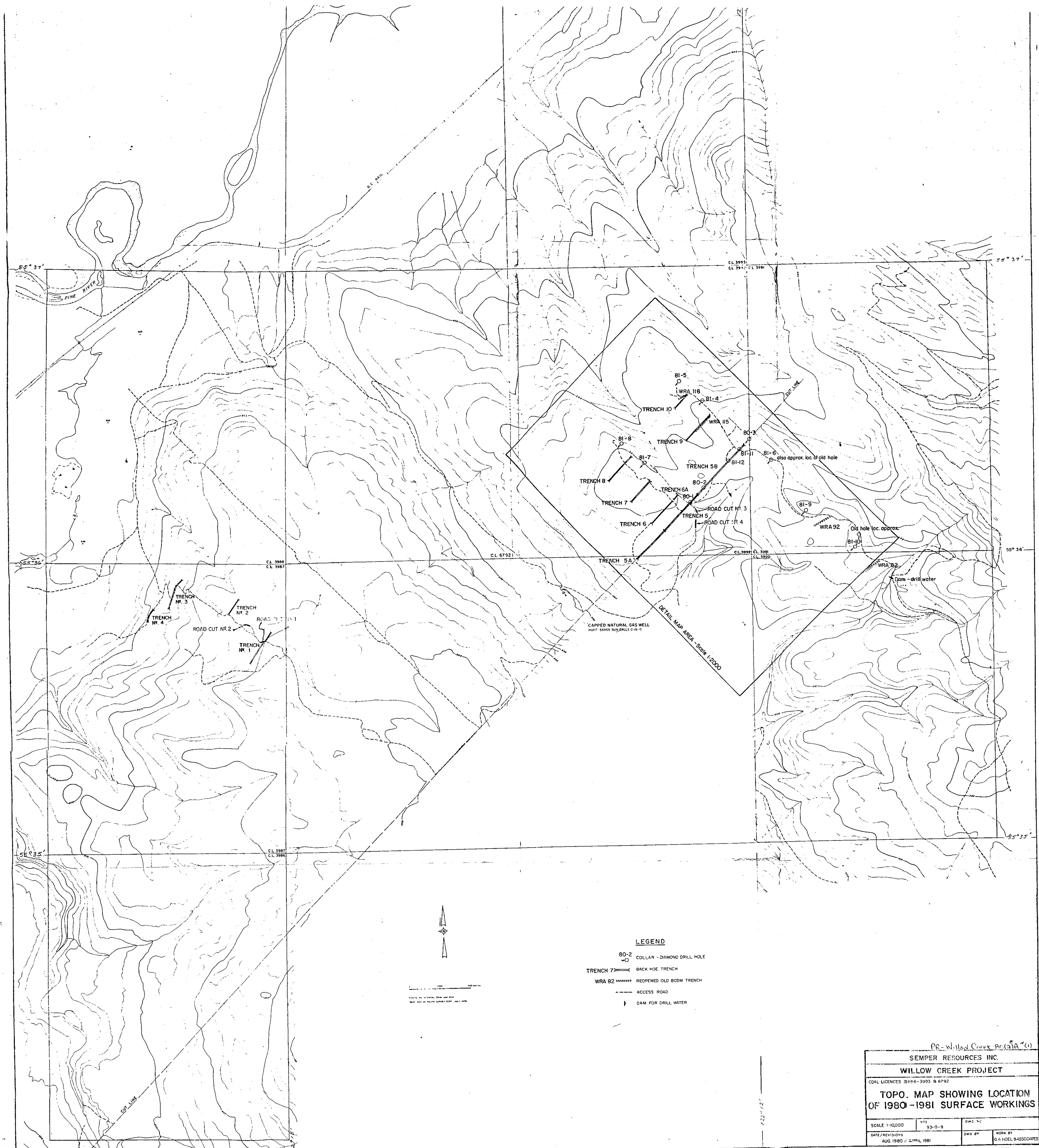
Figure


GETHING FM.
Blue Sky Conglomerate
MOOSEBAR FM.
APPROX. ADIT COLLARED AT 7500N, 6100E (Projected from El. 620m.)
Tunnel 166° (true)
Possible tunnel interception coal zone #7
B.L.
8000 N
7000 N
6000 N
5000 N
4000 N
4000E
5000E
6000E
MOOSEBAR FORMATION
Blue Sky Conglomerate
GETHING FORMATION
approx licence boundary from Fig 6
3993
3992
3991
3990
6274
55° 36'
122° 13'
LEGEND
B.L. — Baseline
A — B Coal zone correlation chart section A-B
Fault
Measured coal seam - Surface trace
Indicated coal seam
Inferred coal seam
Adit and tunnel
T3800 Trench
Conglomerate — Outcrop
" — Indicated from drill holes
" — Inferred between section
COAL SEAMS PROJECTED FROM DRILL HOLES UNLESS OTHERWISE INDICATED.
G.N.
T.N.
46°16'41"
0 200 metres
690
Pr- Willow Creek 81
Survey by McElhaney, Nov. 1981 (Preliminary Map)
DAVID MINERALS LIMITED
WILLOW CREEK PROJECT
COAL LICENCES 3956-3993, 6792, 7191 & 7192
GEOLOGY
SCALE 1:5000
NTS 93-0-9
DWG. NO.
DATE REVISIONS
DEC. 1981
DWG. BY
WORK BY G.A. NOEL & ASSOCIATES

Figure 29


8000 N
7000 N
6000 N
5000 N
4000 N
4000 E
5000 E
6000 E
B.L.
GETHING FM.
Blue Sky Conglomerate
MOOSEBAR FM.
APPROX. ADIT COLLARED AT 7500N, 6100 E (Projected from El. 620m.)
Tunnel 166° (true)
Possible tunnel interception coal zone #7
A
B
C
D
81-43
81-45
81-41
T7177
T7060
T6960
T6940
81-30
81-26
81-27
81-24
T6560
81-28
T6500
81-32
81-23
81-34
T6198
81-21
T6040
81-37
81-35
T5976
T5910
81-20
81-38
T5790
81-18
81-5
81-33
81-8
81-16
81-31
81-4
81-7
T-8
T-7
T-6
81-14
81-13
81-36
81-29
80-2
80-1
81-12
81-11
80-3
81-19
81-40
81-6
81-25
81-42
81-15
Outcrop from roadcut
81-22
81-44
81-9
T4320
81-46
81-17
81-10
T3800
MOOSEBAR FORMATION
GETHING FORMATION
Blue Sky Conglomerate
55°37' 122°13'
55°37' 122°12'
55°36' 122°13'
55°36' 122°12'
LEGEND
B.L. — Baseline
A — B Coal zone correlation chart section A-B
Fault
Measured coal seam - Surface trace
Indicated coal seam
Inferred coal seam
Adit and tunnel
T3800 Trench
Conglomerate — Outcrop
" — Indicated from drill holes
" — Inferred between section
COAL SEAMS PROJECTED FROM DRILL HOLES UNLESS OTHERWISE INDICATED.
G.N.
T.N.
46°16'41"
0
200 metres
Survey by McElhaney, Nov. 1981 (Preliminary Map)
DAVID MINERALS LIMITED
WILLOW CREEK PROJECT
COAL LICENCES 3986-3993, 6792, 7191 & 7192
GEOLOGY
SCALE 1:5000
NTS 93-O-9
DWG. NO.
DATE REVISIONS
DEC. 1981
DWG. BY
WORK BY
G.A. NOEL & ASSOCIATES

Figure



55° 37'
55° 36'
55° 35'
PINE RIVER
B.C. RAIL
CL 3993
CL 3992
CL 3991
C.L. 3988
C.L. 3987
C.L. 3986
C.L. 6792
C.L. 3990
CUT LINE
81-5
WRA 118
81-4
TRENCH 10
WRA 115
80-3
TRENCH 9
81-8
81-7
81-11
81-12
81-6
also approx. loc. of old hole
TRENCH 5B
TRENCH 8
80-2
TRENCH 6A
80-1
TRENCH 7
ROAD CUT No. 3
TRENCH 5
ROAD CUT No. 4
TRENCH 6
81-9
WRA 92
Old hole loc. approx.
81-10
TRENCH 5A
WRA 82
Dam - drill water
CAPPED NATURAL GAS WELL
HUNT SANDS SUN FALLS C-18-G
DETAIL MAP AREA - Scale 1:2000
TRENCH No. 3
TRENCH No. 2
TRENCH No. 4
ROAD CUT No. 2
TRENCH No. 1
N
LEGEND
80-2 COLLAR - DIAMOND DRILL HOLE
TRENCH 7 BACK HOE TRENCH
WRA 82 REOPENED OLD BCDM TRENCH
ACCESS ROAD
DAM FOR DRILL WATER
PR - Willow Creek 80(2)A (1)
SEMPER RESOURCES INC.
WILLOW CREEK PROJECT
COAL LICENCES 3986-3993 & 6792
TOPO. MAP SHOWING LOCATION OF 1980 - 1981 SURFACE WORKINGS
SCALE 1:10,000
NTS 93-O-9
DWG. NO.
DATE/REVISIONS AUG. 1980 // APRIL 1981
DWG. BY
WORK BY G.A. NOEL & ASSOCIATES

Figure 4

DAVID MINERALS LIMITED.
WILLOW CREEK PROJECT.
HORIZONTAL CONTROL TIED TO LOCAL GRID.
VERTICAL CONTROL BASED ON GEODETIC DATUM.
SURFACE WORKINGS
PHASE II
Scale 1:2500
Contour Interval 5 metre
Date DECEMBER 1981
Worked by G.A. NOEL & ASSOCIATES
Sheet No. 7 of 7.
PRELIMINARY MAP - SURVEYED BY McELHANNEY
Compiled from aerial photography at an approximate scale of 1:24,000
Flown in AUG./81
PR - Willow Creek 81 (2)A #(1)
690
LEGEND
DDH 80-01 DRILL HOLE
T 4200 TRENCH
ROAD (surveyed, unsurveyed)
0 50 100 200
metres
G.N.
T.N.
46°16'41"
5
6
7
DDH 80-01
Elev. 1092.76
DDH 80-02 Elev. 1112.8
DDH 81-12 Elev. 1113.82
DDH 81-40
Elev. 1073.3
DDH 81-42
Elev. 1109.9
DDH 81-44
Elev. 1133.0
DDH 81-46
Elev. 1141.3
DDH 81-6
El. 1129.3
DDH 81-15
Elev. 1137.0
DDH 81-9
Elev. 1158.8
DDH 81-17
Elev. 1155.4
DDH 81-10
Elev. 1161.3
DDH 81-25
Elev. 1113.1
DDH 81-22
Elev. 1127.0
T-5A
T-5
T-5B
CUT LINE
CORE SLACK CLEARING
TRAIL
T4616
T4320
T 3800
3992
3991
3990
6274
122°01'2'
50°36'
4750 E
5000 E
5250 E
5500 E
5750 E
6000 E
6250 E
6500 E
4750N
4500N
4250N
4000N
3750N

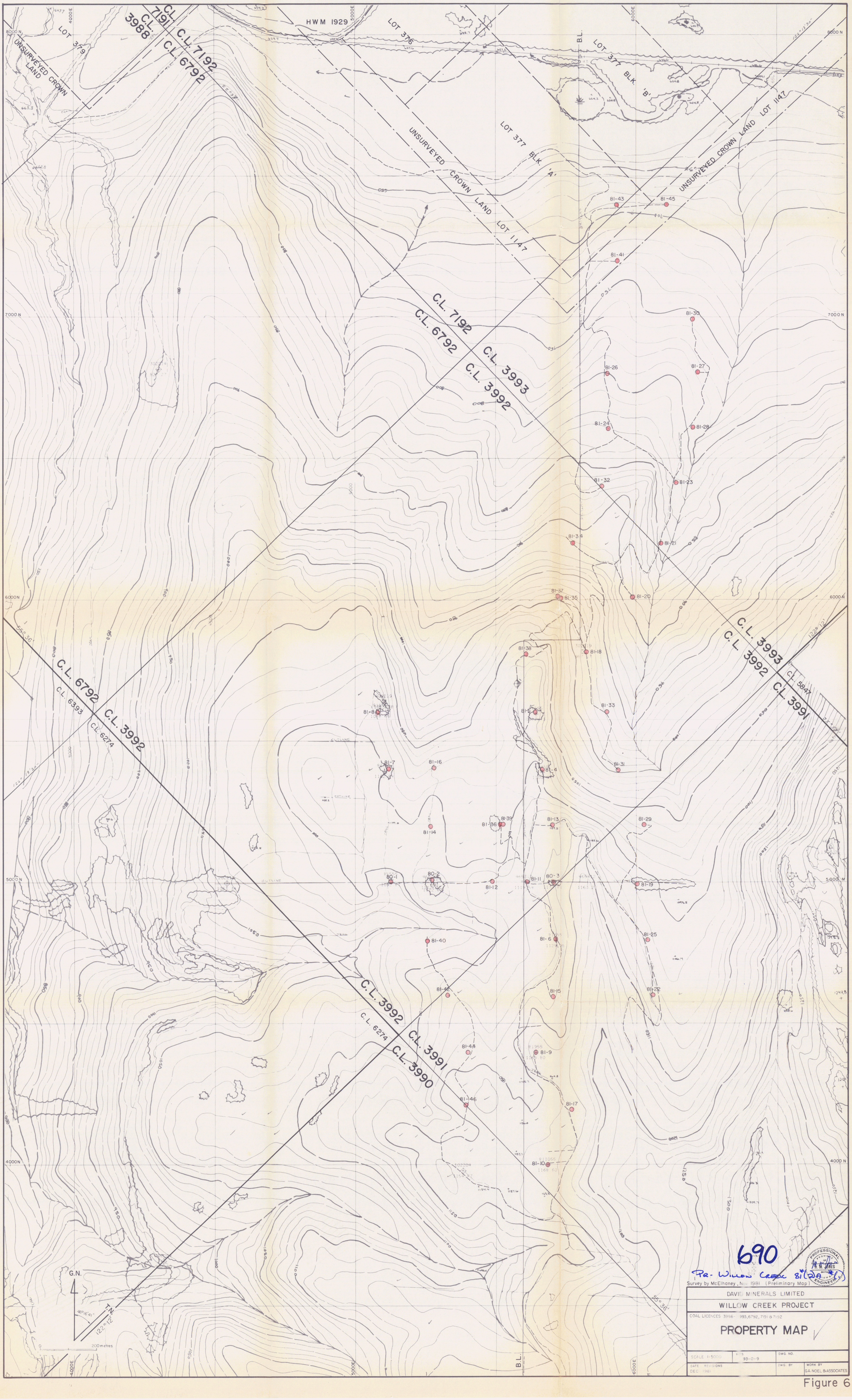
Figure 4c

690
Pr-Willow Creek 81*(2)a*(1)
PRELIMINARY MAP — SURVEYED BY McELHANNEY
Compiled from aerial photography at an approximate scale of 1:24000
H. M. JONES
Flown in AUG./81.
DAVID MINERALS LIMITED.
WILLOW CREEK PROJECT
HORIZONTAL CONTROL TIED TO LOCAL GRID.
VERTICAL CONTROL BASED ON GEODETIC DATUM.
SURFACE WORKINGS
PHASE II
Scale 1:2500
Contour Interval 5 metre
Date DECEMBER 1981
Worked by G.A. NOEL & ASSOCIATES
Sheet No. 5 of 7
For legend see sheet 7
metres
DDH 81-43
DDH 81-45
DDH 81-41
DDH 81-30
DDH 81-27
DDH 81-26
DDH 81-28
DDH 81-24
T 7575
T 7617
T 7177
T 7060
T 6960
T 6959
T 6940
T 6592

Figure 4a


DDH 81-32 Elev. 883.4
DDH 81-23 Elev. 823.4
DDH 81-34 Elev. 909.3
DDH 81-21 Elev. 851.8
DDH 81-20 Elev. 891.7
DDH 81-18 Elev. 986.4
DDH 81-33 Elev. 985.6
DDH 81-08 Elev. 1088.6
DDH 81-05 Elev. 1083.53
DDH 81-31 Elev. 990.0
DDH 81-16 Elev. 1093.2
DDH 81-04
DDH 81-07 Elev. 1103.11
DDH 81-29 Elev. 1065.0
DDH 81-39 Elev. 1089.3
DDH 81-13 Elev. 1129.8
DDH 81-14 Elev. 1107
DDH 81-19 Elev. 1105.4
DDH 81-11
DDH 80-03 Elev. 1133.7
T6560
T6500
T6393
T6377
T6198
T6174
T6120
T6095
T6040
T6000
T5983
T5979
T5976
T5974
T5961
T5920
T5910
T5870
T5850
T5830
T5800
T5796
T5790
T5080
For legend see Sheet 7
metres
0 50 100 200
G.N.
5
6
7
690
PR- WILLOW CREEK 81 (2)A
PRELIMINARY MAP — SURVEYED BY McELHANNEY
Compiled from aerial photography at an approximate scale of 1 : 24000 flown in AUG./81.
PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA H. M. JONES
DAVID MINERALS LIMITED.
WILLOW CREEK PROJECT
HORIZONTAL CONTROL TIED TO LOCAL GRID.
VERTICAL CONTROL BASED ON GEODETIC DATUM.
SURFACE WORKINGS
PHASE II
Scale 1:2500
Contour Interval 5 metre
Date DECEMBER 1981
Worked by G.A. NOEL & ASSOCIATES
Sheet No. 6 of 7

Figure 4b



690

Re- Willow Creek 81(2)A*(1)

Survey by McElhaney, Nov 1981 (Preliminary Map)

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA H. M. JONES

DAVID MINERALS LIMITED

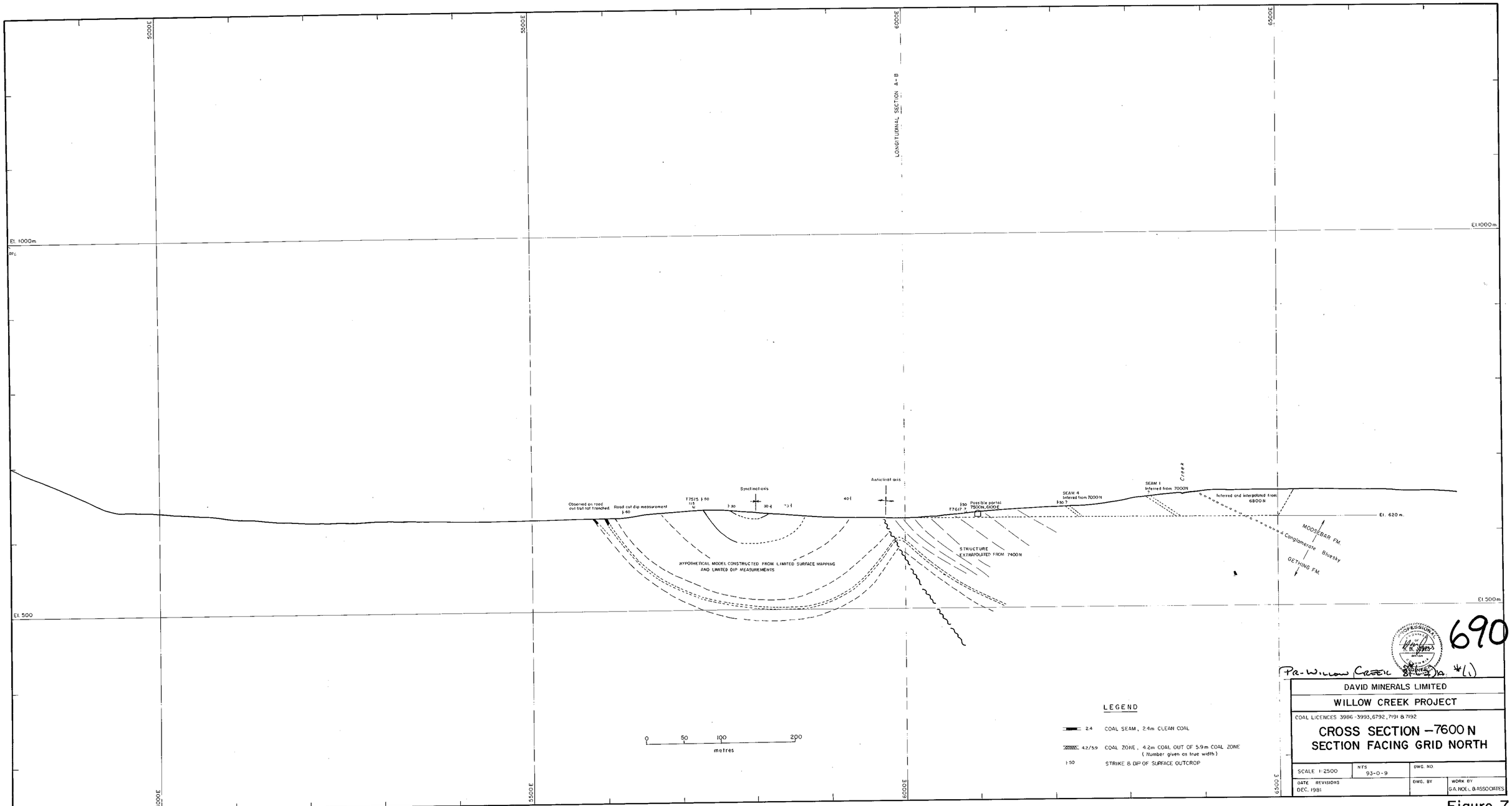
WILLOW CREEK PROJECT

COAL LICENCES 3956-3993, 6792, 7191 & 7192

PROPERTY MAP

SCALE 1:5000	FILE 93-0-9	DWG. NO.
DATE REVISIONS DEC 1981	DWG. BY	WORK BY G.A. NOEL & ASSOCIATES

Figure 6



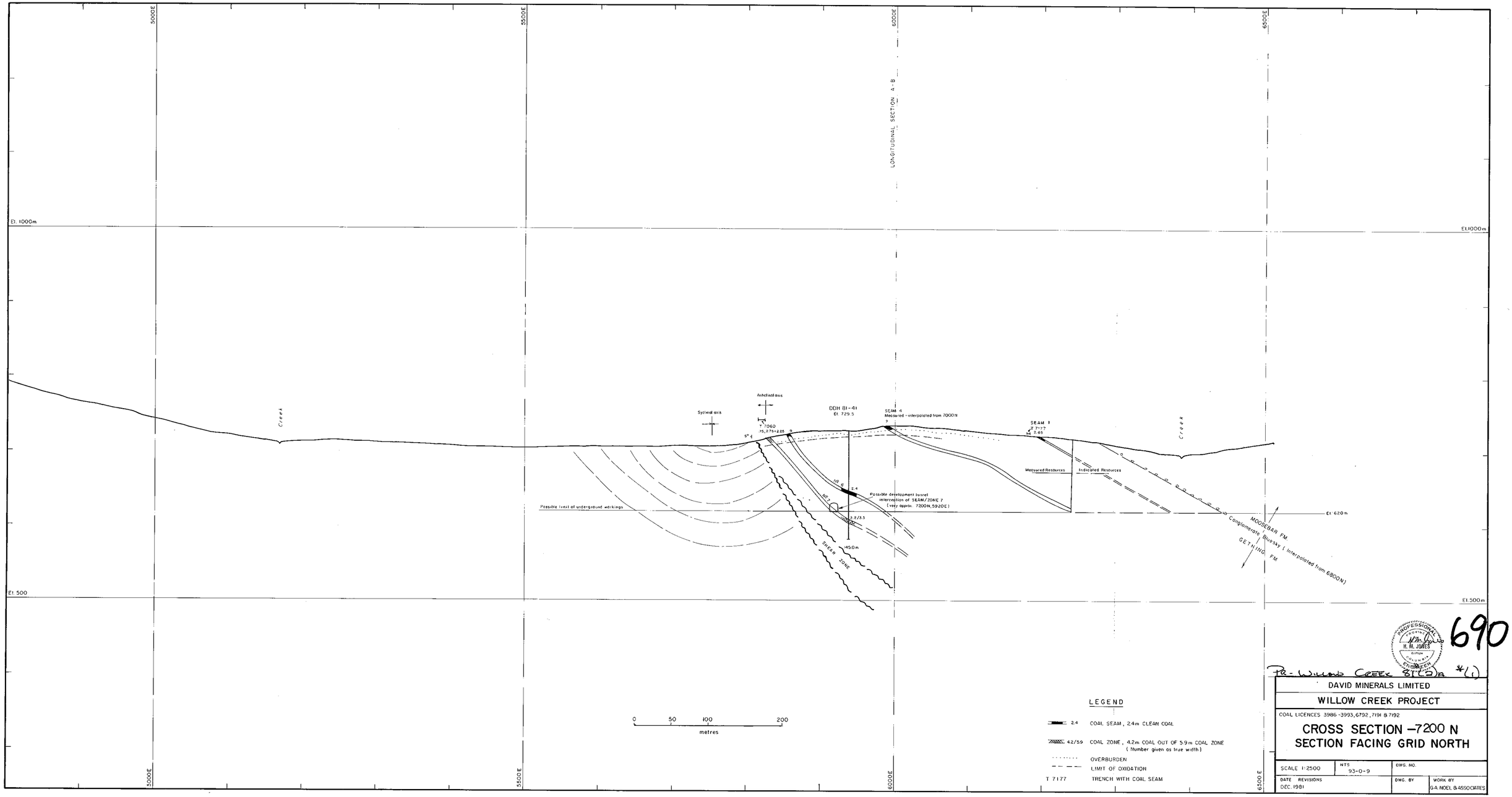
690

Pa-Willow Creek Dr. #(1)

Figure 7


5000E
5500E
6000E
6500E
LONGITUDINAL SECTION A-B
El. 1000m
El. 500
El. 620m.
Creek
No surface Geological info.
Syclinal axis
Anticlinal axis
DDH 81-43
El. 690.2
DDH 81-45
El. 689.9
SEAM 4
Indicated from 7000 N
SEAM 1
Indicated from 7000 N
Strictly hypothetical
Possible limit of underground workings
Possible Adit
7400N, 6040 E
SHEAR ZONE
Intense fracturing and calcite veining with some brecciation
Nº 7A
Nº 7B
Possible SEAM ? ?
161.2m
166.7m
Indicated
MOOSEBAR FM.
Conglomerate Bluesky
GETHING FM.
0 50 100 200
metres
LEGEND
2.4 COAL SEAM, 2.4m CLEAN COAL
4.2/5.9 COAL ZONE, 4.2m COAL OUT OF 5.9m COAL ZONE
(Number given as true width)
OVERBURDEN
SURF. LIMIT OF OXIDATION
690
H. M. JONES
BRITISH COLUMBIA
PR-WILLOW CREEK 81(2)A *(1)
DAVID MINERALS LIMITED
WILLOW CREEK PROJECT
COAL LICENCES 3986-3993, 6792, 7191 & 7192
CROSS SECTION – 7400 N
SECTION FACING GRID NORTH
SCALE 1:2500
NTS 93-0-9
DW NO.
DATE REVISIONS
DEC. 1981
DW. BY
WORK BY
G.A. NOEL & ASSOCIATES

Figure 8



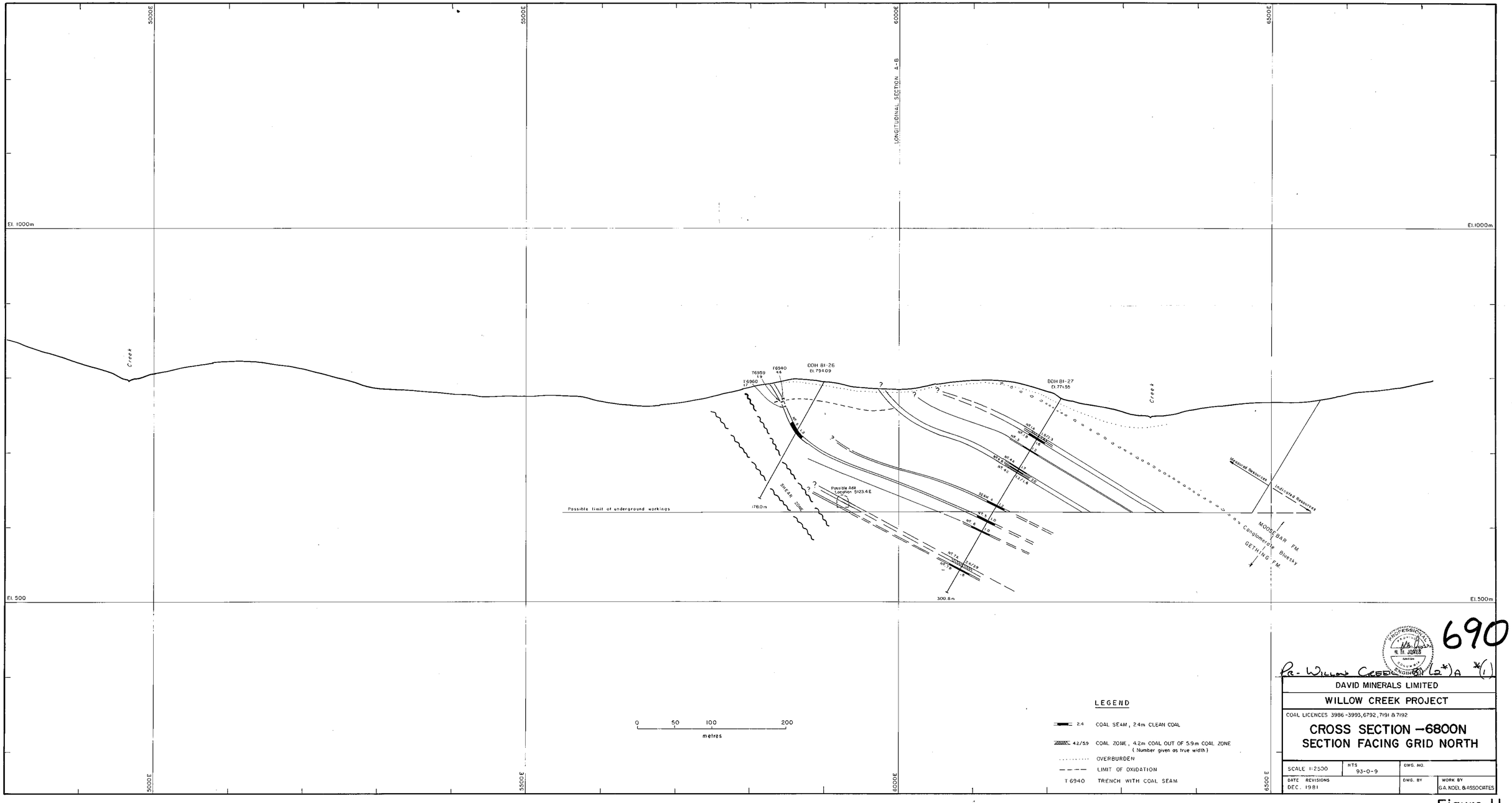
690

Re - Willow Creek 81-D-8 #(1)

Figure 9

5000E
5500E
6000E
6500E
LONGITUDINAL SECTION A - B
El. 1000m
El.1000m
El. 500
El.500m
El. 620m
Creek
Creek
T 6960 1.7
T 6959 1.9
T 6940 4.6
T7060
.75, 2.75+2.25
T 7177
2.65
DDH 81-30
El. 748.44
SHEAR ZONE
Possible Adit
Possible limit of underground workings
255.1m
Measured Resources
Indicated Resources
MOOSEBAR FM.
Conglomerate Bluesky (interpolated from 6800N)
GETHING FM.
0 50 100 200
metres
LEGEND
2.4 COAL SEAM, 2.4m CLEAN COAL
4.2/5.9 COAL ZONE, 4.2m COAL OUT OF 5.9m COAL ZONE (Number given as true width)
OVERBURDEN
T 7177 TRENCH WITH COAL SEAM
690
H. M. JONES
Pre-Willow Creek
DAVID MINERALS LIMITED
WILLOW CREEK PROJECT
COAL LICENCES 3986-3993, 6792, 7191 & 7192
CROSS SECTION – 7000 N
SECTION FACING GRID NORTH
SCALE 1:2500
NTS 93-0-9
DWG. NO.
DATE REVISIONS
DEC. 1981
DWG. BY
WORK BY G.A. NOEL & ASSOCIATES

Figure 10



690

RR - Willow Creek (1a*)A *(1)

DAVID MINERALS LIMITED

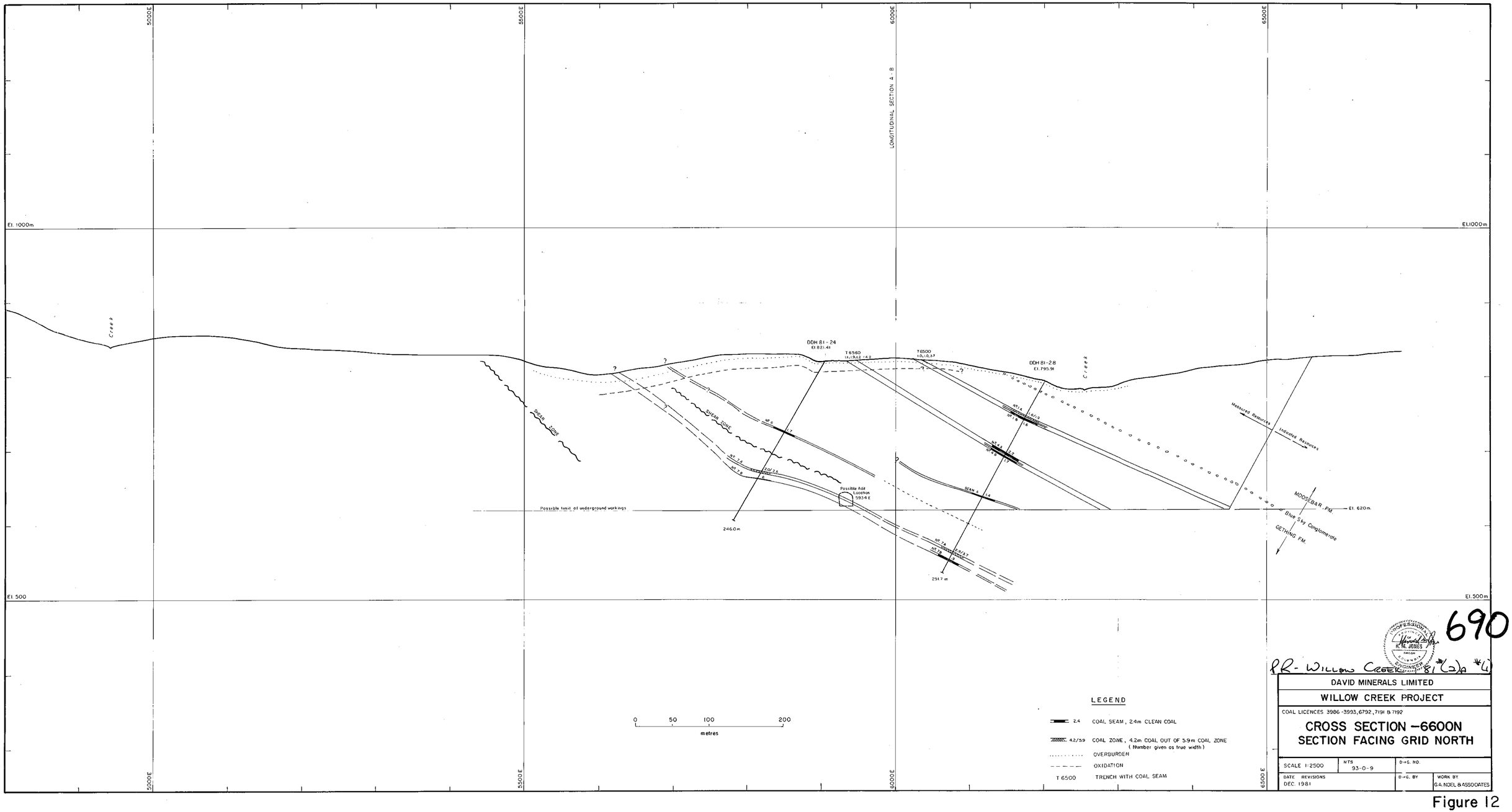
WILLOW CREEK PROJECT

COAL LICENCES 3986-3993, 6792, 7191 & 7192

CROSS SECTION -6800N
SECTION FACING GRID NORTH

SCALE 1:2500	NTS 93-O-9	DWG. NO.
DATE REVISIONS DEC. 1981	DWG. BY	WORK BY G.A. NOEL & ASSOCIATES

Figure 11



690

RR - Willows Creek 81 (2)A #4

DAVID MINERALS LIMITED

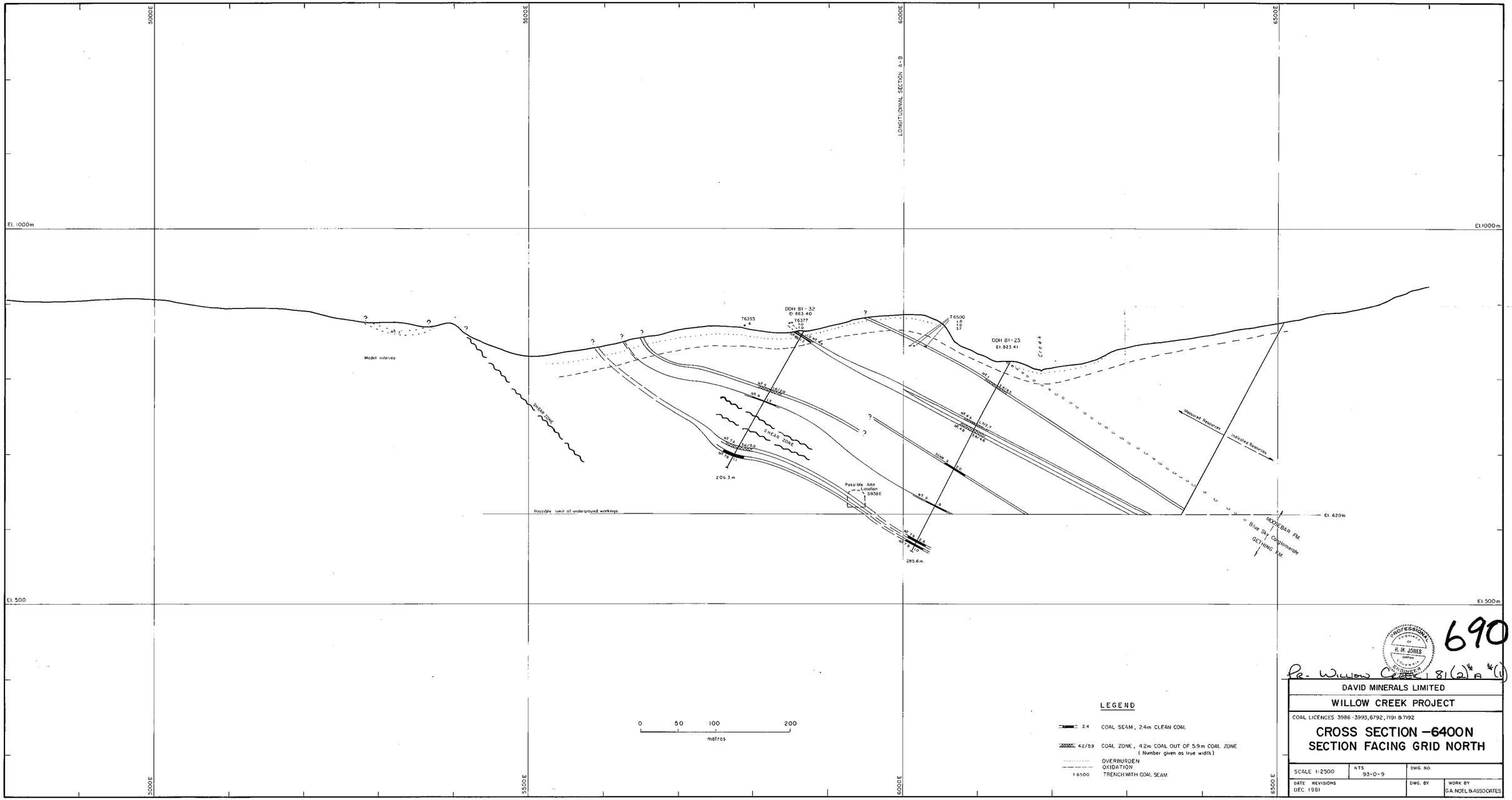
WILLOW CREEK PROJECT

COAL LICENCES 3986-3993, 6792, 7191 & 7192

CROSS SECTION -6600N
SECTION FACING GRID NORTH

SCALE 1:2500	NTS 93-O-9	D+G. NO.	
DATE REVISIONS DEC. 1981		D+G. BY	WORK BY G.A. NOEL & ASSOCIATES

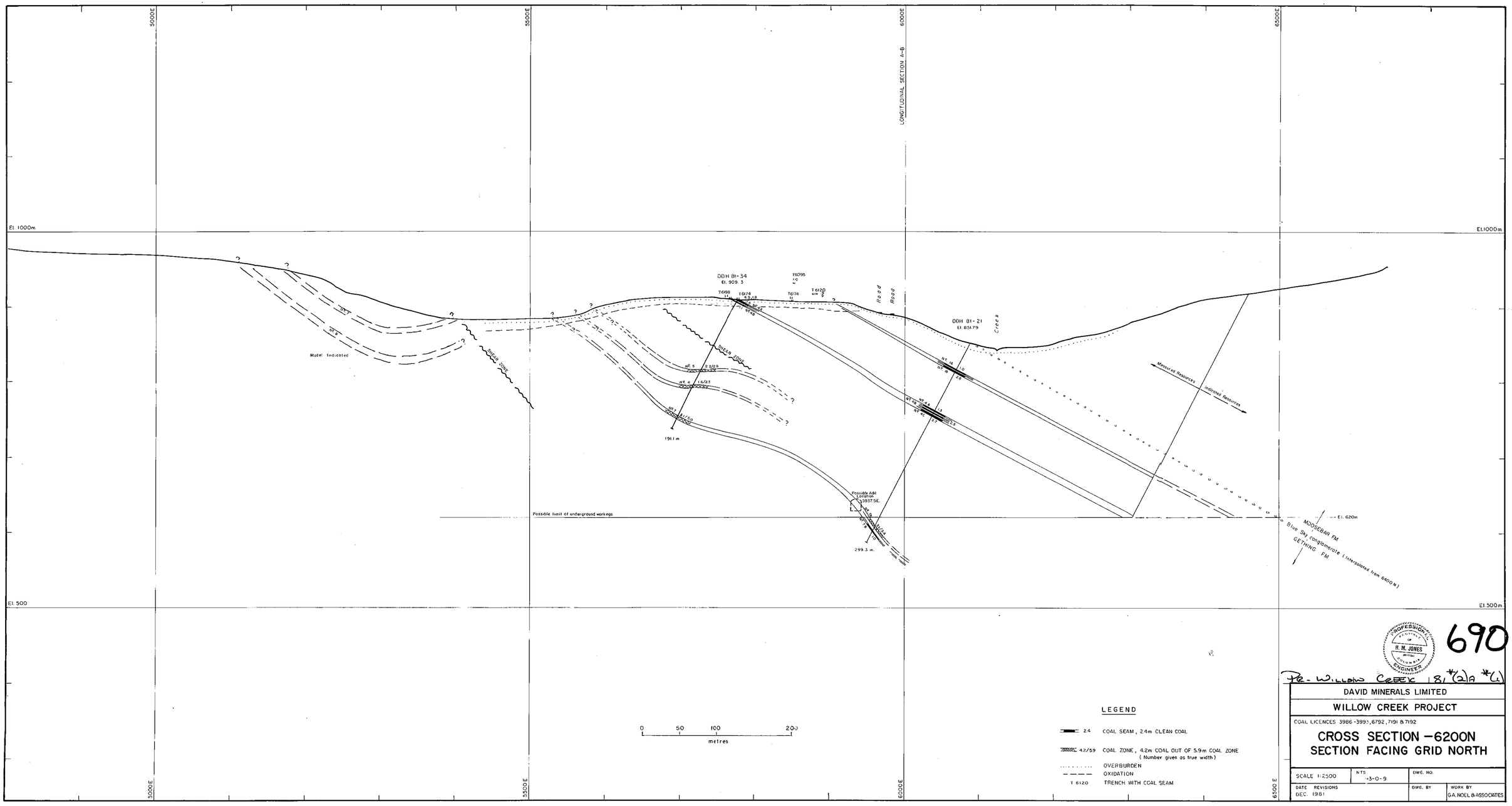
Figure 12



690

Re- Willow Creek 81(2)(a)(i)

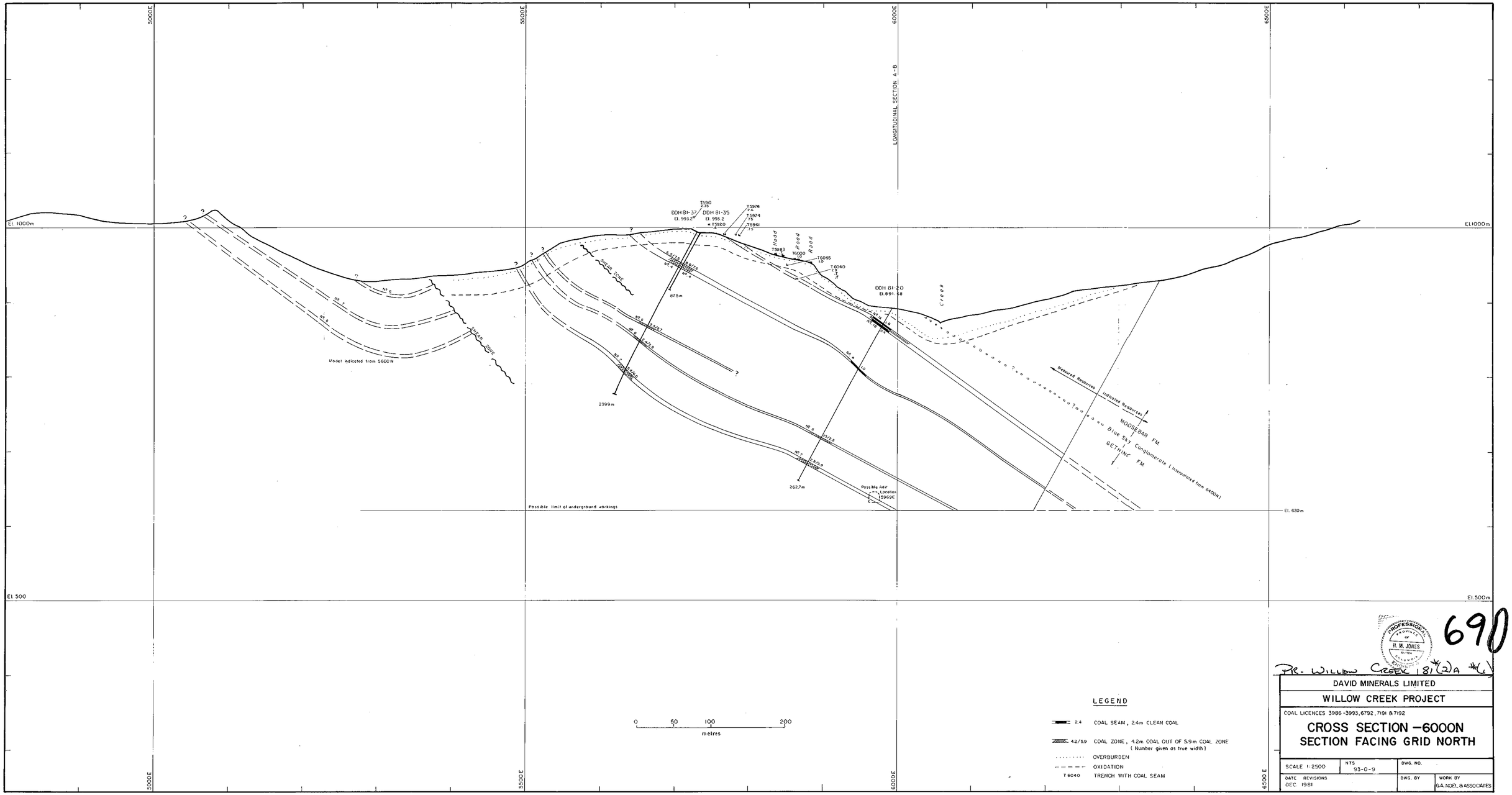
Figure 13



690

Pre-Willow Creek 81 #(2)A #(1)

Figure 14



690

PR- WILLOW CREEK 81(2)A #(1)

DAVID MINERALS LIMITED

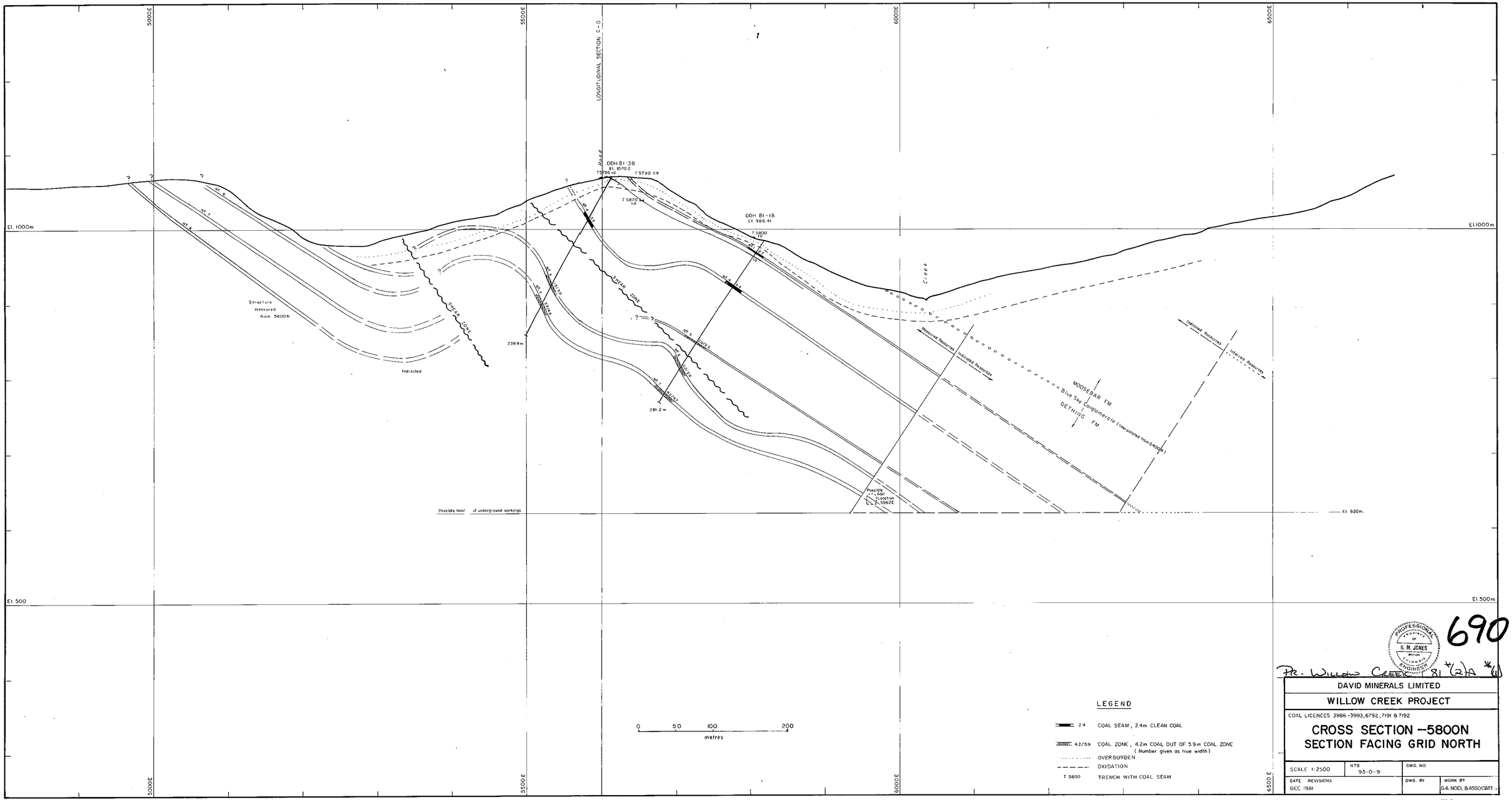
WILLOW CREEK PROJECT

COAL LICENCES 3986-3993, 6792, 7191 & 7192

CROSS SECTION -6000N
SECTION FACING GRID NORTH

SCALE 1:2500	NTS 93-O-9	DWG. NO.	
DATE REVISIONS DEC. 1981		DWG. BY	WORK BY G.A. NOEL & ASSOCIATES

Figure 15



690

Re: Willow Creek 81-2A #1

DAVID MINERALS LIMITED

WILLOW CREEK PROJECT

COAL LICENCES 3986-3993, 6792, 7191 & 7192

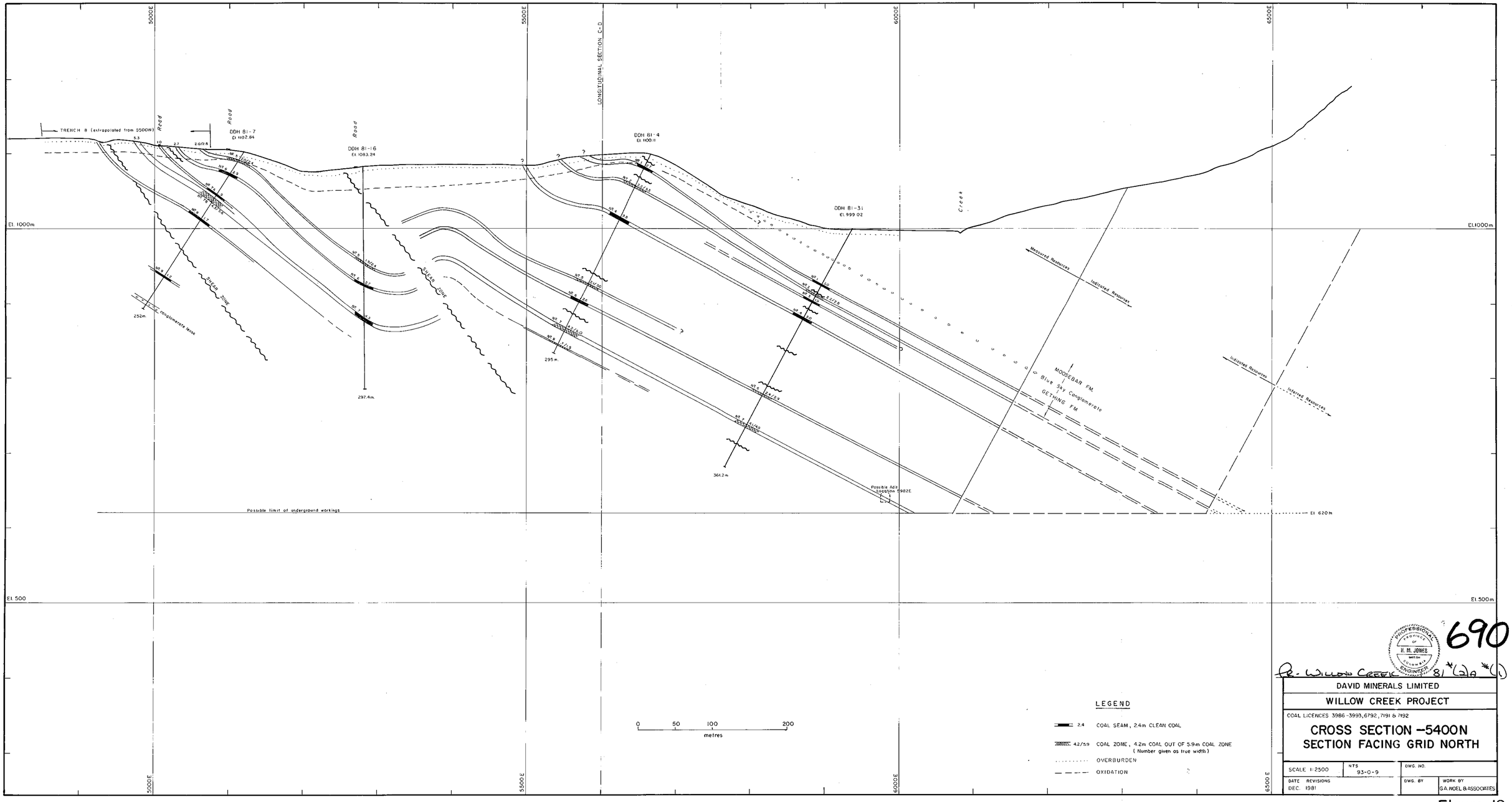
CROSS SECTION -5800N
SECTION FACING GRID NORTH

SCALE 1:2500	NTS 93-O-9	DWG. NO.	
DATE REVISIONS DEC. 1981		DWG. BY	WORK BY G.A. NOEL & ASSOCIATES

Figure 16


5000E
5500E
6000E
6500E
LONGITUDINAL SECTION C-D
Road
DDH 81-8
El. 1088.6
DDH 81-5
El. 1083.53
DDH 81-33
El. 985.6 (approx.)
El. 1000m
El. 500
El. 620m
137m
282.5m
294.4m
SHEAR ZONE
Creek
MOOSEBAR FM
Blue Sky Conglomerate
GETHING FM
Measured Resources
Indicated Resources
Inferred Resources
Possible Adit Location 5990E
Possible limit of underground workings
0 50 100 200
metres
LEGEND
2.4 COAL SEAM, 2.4m CLEAN COAL
4.2/5.9 COAL ZONE, 4.2m COAL OUT OF 5.9m COAL ZONE
(Number given as true width)
OVERBURDEN
OXIDATION
PROFESSIONAL PROVINCE OF H. M. JONES BRITISH COLUMBIA ENGINEER
690
PR- WILLOW CREEK 81 *(2)A *(1)
DAVID MINERALS LIMITED
WILLOW CREEK PROJECT
COAL LICENCES 3986-3993, 6792, 7191 & 7192
CROSS SECTION -5600N
SECTION FACING GRID NORTH
SCALE 1:2500
NTS 93-O-9
DWG. NO.
DATE REVISIONS
DEC. 1981
DWG. BY
WORK BY
G.A. NOEL & ASSOCIATES

Figure 17



690

Re- Willow Creek 81 #2A #4

Figure 18


5000E
5500E
6000E
6500E
LONGITUDINAL SECTION C-O
DDH 81-14
DDH 81-36
DDH 81-39
DDH 81-13
DDH 81-29
Road
SHEAR ZONE
El. 1000m
El. 500
El. 500m
El. 620m
Possible limit of underground workings
Measured Resources
Indicated Resources
Inferred Resources
MOOSEBAR FM.
Blue Sky Conglomerate
GETHING FM.
0 50 100 200
metres
LEGEND
2.4 COAL SEAM, 2.4m CLEAN COAL
4.2/5.9 COAL ZONE, 4.2m COAL OUT OF 5.9m COAL ZONE (Number given as true width)
OVERBURDEN
OXIDATION
T 5080 TRENCH WITH COAL SEAM
H. M. JONES
690
DAVID MINERALS LIMITED
WILLOW CREEK PROJECT
COAL LICENCES 3986-3993, 6792, 7191 & 7192
CROSS SECTION -5200N
SECTION FACING GRID NORTH
SCALE 1:2500
NTS 93-0-9
DWG. NO.
DATE REVISIONS
DEC. 1981
DWG. BY
WORK BY
G NOEL & ASSOCIATES

Figure 19

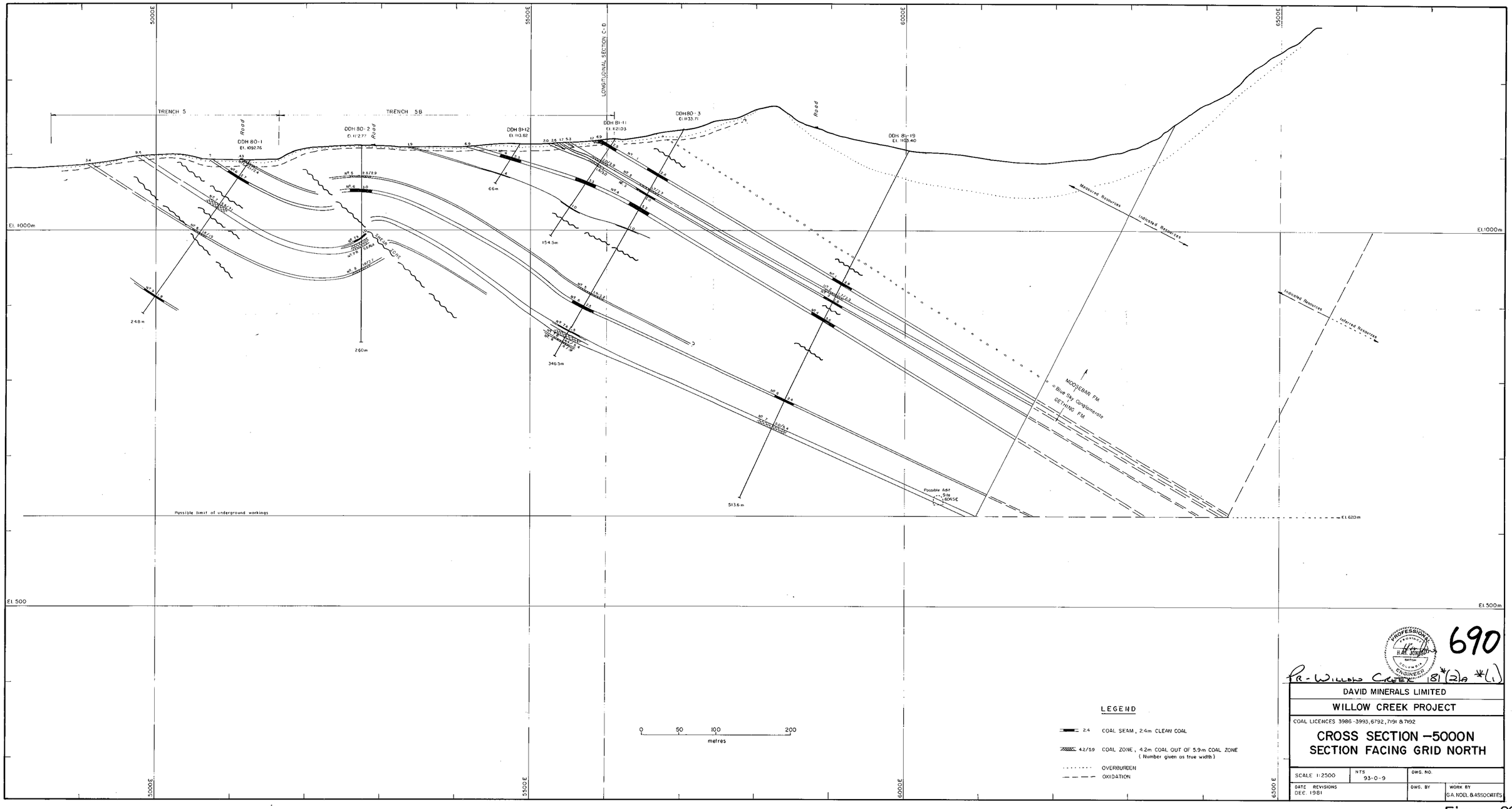

5000E
5500E
6000E
6500E
LONGITUDINAL SECTION C-D
TRENCH 5
TRENCH 5B
Road
DDH 80-1
El. 1092.76
DDH 80-2
El. 1112.77
DDH 81-12
El. 1113.82
DDH 81-11
El. 1121.03
DDH80-3
El. 1133.71
DDH 81-19
El. 1165.40
El. 1000m
El. 500
248m
260m
66m
154.5m
346.5m
513.6m
Measured Resources
Indicated Resources
Inferred Resources
MOOSEBAR FM
Blue Sky Conglomerate
GETHING FM
Possible Adit Site 1604SE
Possible limit of underground workings
El. 620m
0 50 100 200
metres
LEGEND
2.4 COAL SEAM, 2.4m CLEAN COAL
42/59 COAL ZONE, 42m COAL OUT OF 59m COAL ZONE (Number given as true width)
OVERBURDEN
OXIDATION
PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
H. M. JOHNSON
690
FR-WILLOW CREEK 81(29 #(1)
DAVID MINERALS LIMITED
WILLOW CREEK PROJECT
COAL LICENCES 3986-3993, 6792, 7191 & 7192
CROSS SECTION -5000N
SECTION FACING GRID NORTH
SCALE 1:2500
NTS 93-O-9
DWG. NO.
DATE REVISIONS DEC. 1981
DWG. BY
WORK BY G.A. NOEL & ASSOCIATES

Figure 20

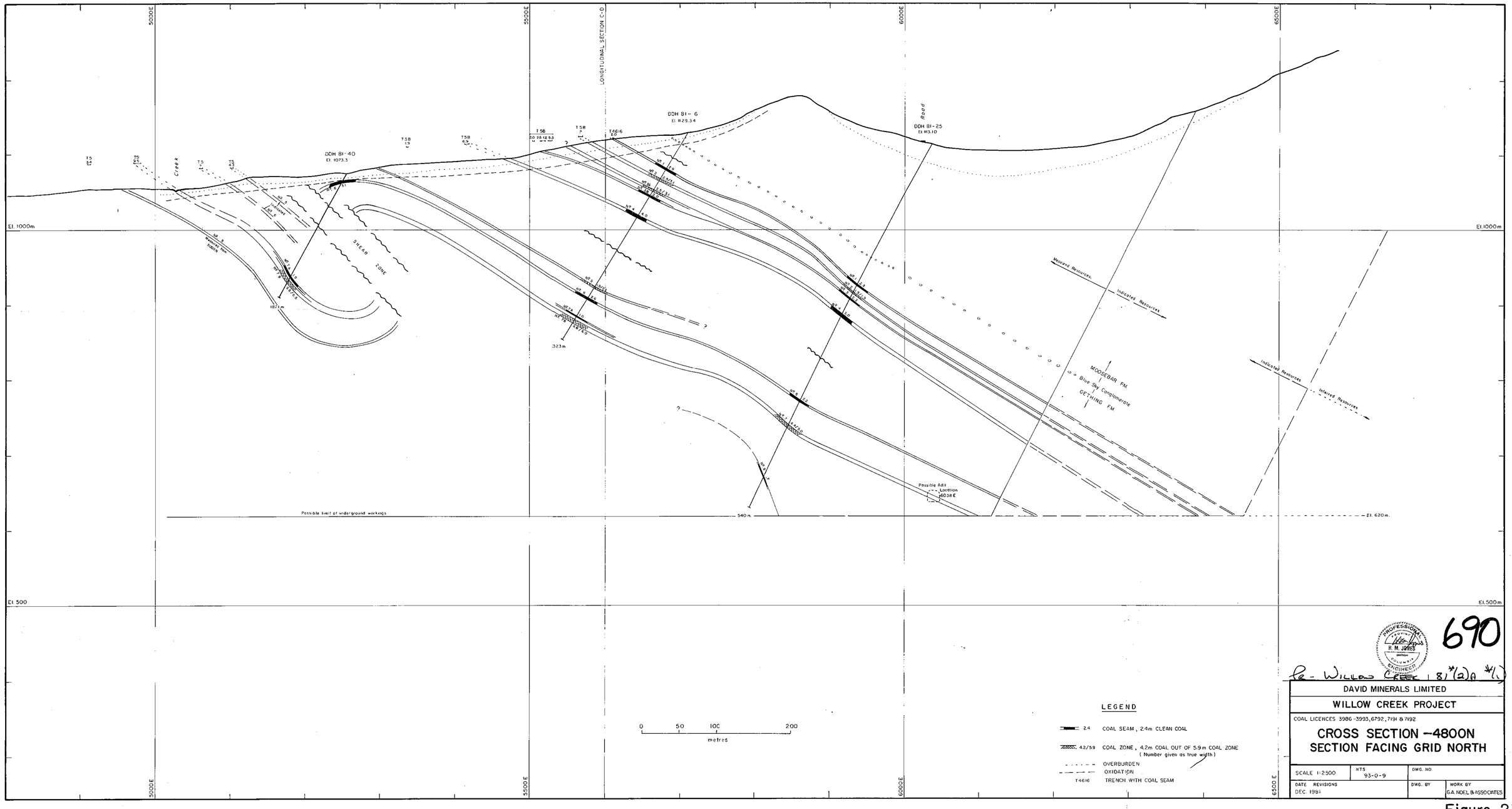
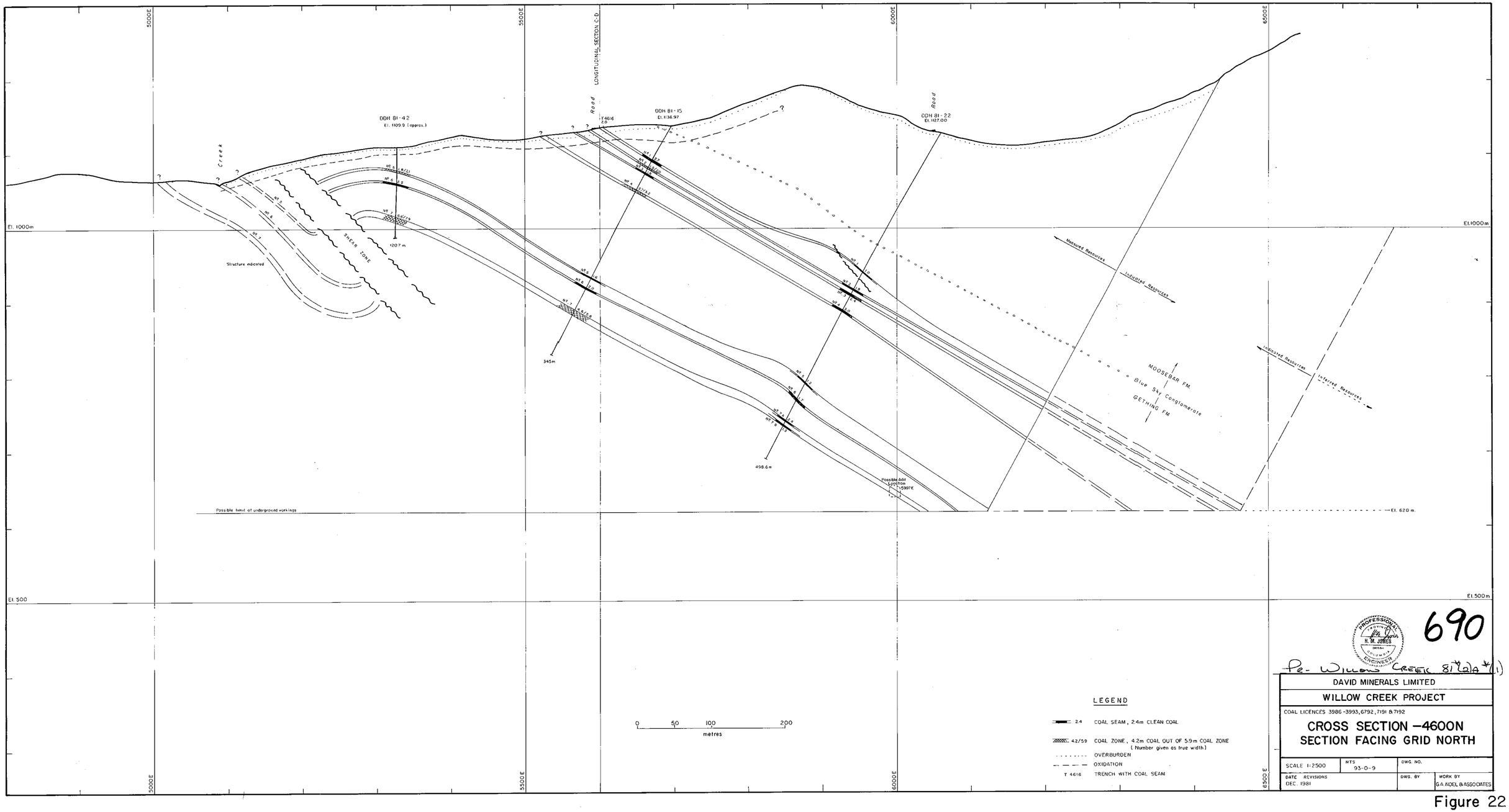

5000E
5500E
LONGITUDINAL SECTION C-D
6000E
6500E
DDH 81-40
El. 1073.3
DDH 81-6
El. 1129.34
DDH 81-25
El. 1113.10
Road
Creek
SHEAR ZONE
Mineral Resources
Indicated Resources
Inferred Resources
MOOSEBAR FM
Blue Sky Conglomerate
GETHING FM
Possible Adit Location 6038E
323m.
540m.
Possible limit of underground workings
El. 1000m
El. 500
El. 620m.
0 50 100 200
metres
LEGEND
COAL SEAM, 2.4m CLEAN COAL
COAL ZONE, 4.2m COAL OUT OF 5.9m COAL ZONE
(Number given as true width)
OVERBURDEN
OXIDATION
TRENCH WITH COAL SEAM
690
Re- Willow Creek 81(2)A #1
DAVID MINERALS LIMITED
WILLOW CREEK PROJECT
COAL LICENCES 3986-3993, 6792, 7191 & 7192
CROSS SECTION -4800N
SECTION FACING GRID NORTH
SCALE 1:2500
NTS 93-O-9
DWG. NO.
DATE REVISIONS
DEC. 1981
DWG. BY
WORK BY
G.A. NOEL & ASSOCIATES

Figure 21



690

Pe- Willow Creek 81-90A #(1)

DAVID MINERALS LIMITED

WILLOW CREEK PROJECT

COAL LICENCES 3986-3993, 6792, 7191 & 7192

CROSS SECTION -4600N SECTION FACING GRID NORTH

SCALE 1:2500	NTS 93-O-9	DWG. NO.
DATE REVISIONS DEC. 1981	DWG. BY	WORK BY G.A. NOEL & ASSOCIATES

Figure 22


5000E
5500E
6000E
6500E
LONGITUDINAL SECTION C-D
Road
DDH 81-44
El 1133.0 (approx.)
DDH 81-9
El 1158.84
El 1000m
El 500
El 500m
El 620m
SHEAR
ZONE
Model inferred
Possible limit of underground workings
Measured Resources
Indicated Resources
Inferred Resources
MOOSEBAR FM.
Blue Sky Conglomerate
GETHING FM.
328m
0
50
100
200
metres
LEGEND
2.4 COAL SEAM, 2.4m CLEAN COAL
4.2/5.9 COAL ZONE, 4.2m COAL OUT OF 5.9m COAL ZONE
(Number given as true width)
OVERBURDEN
OXIDATION
690
H. M. JONES
PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
DAVID MINERALS LIMITED
WILLOW CREEK PROJECT
COAL LICENCES 3986-3993, 6792, 7191 & 7192
CROSS SECTION -4400N
SECTION FACING GRID NORTH
SCALE 1:2500
NTS 93-0-9
DWG. NO.
DATE REVISIONS
DEC. 1981
DWG. BY
WORK BY
G.A. NOEL & ASSOCIATES

Figure 23

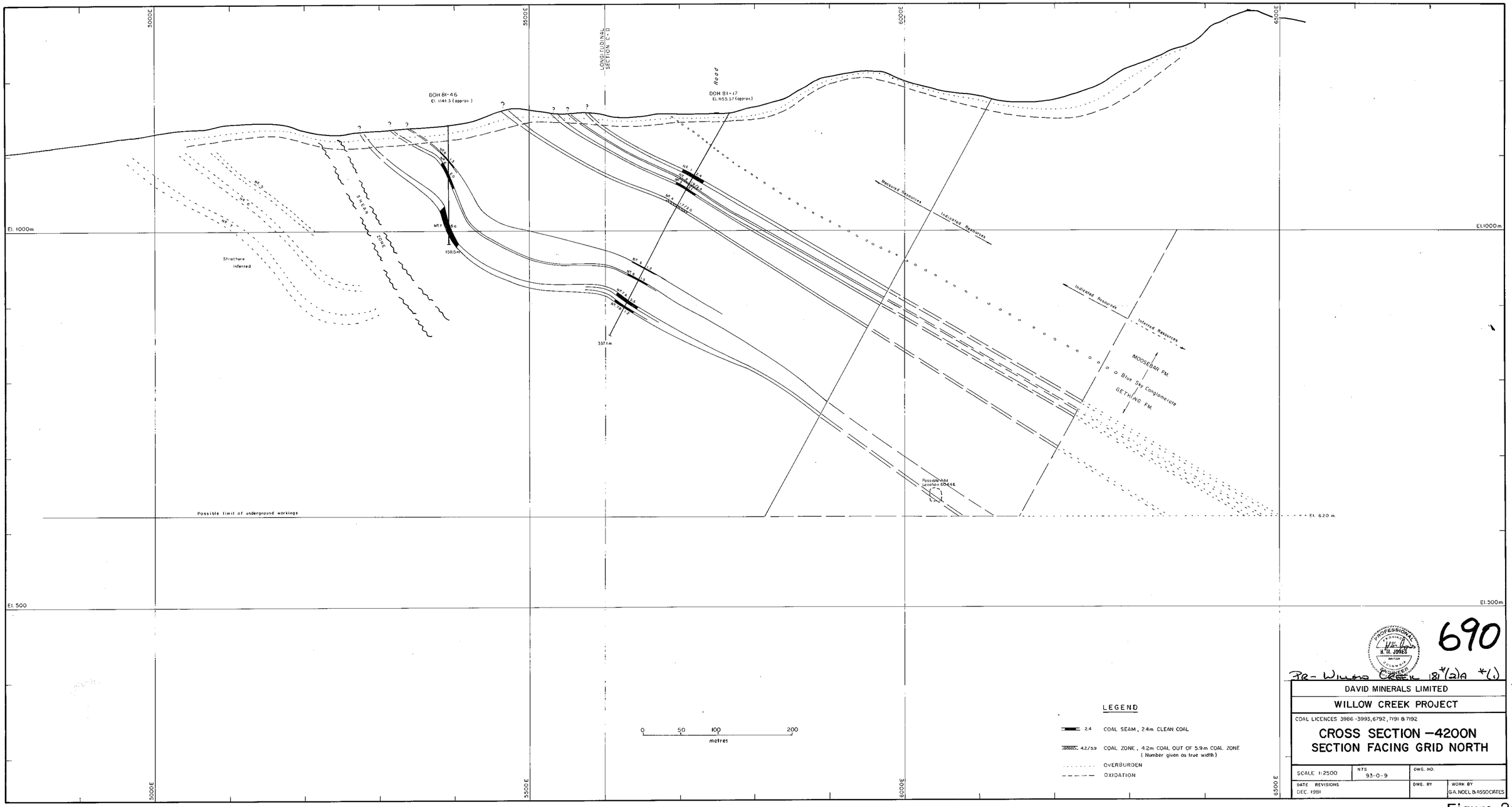
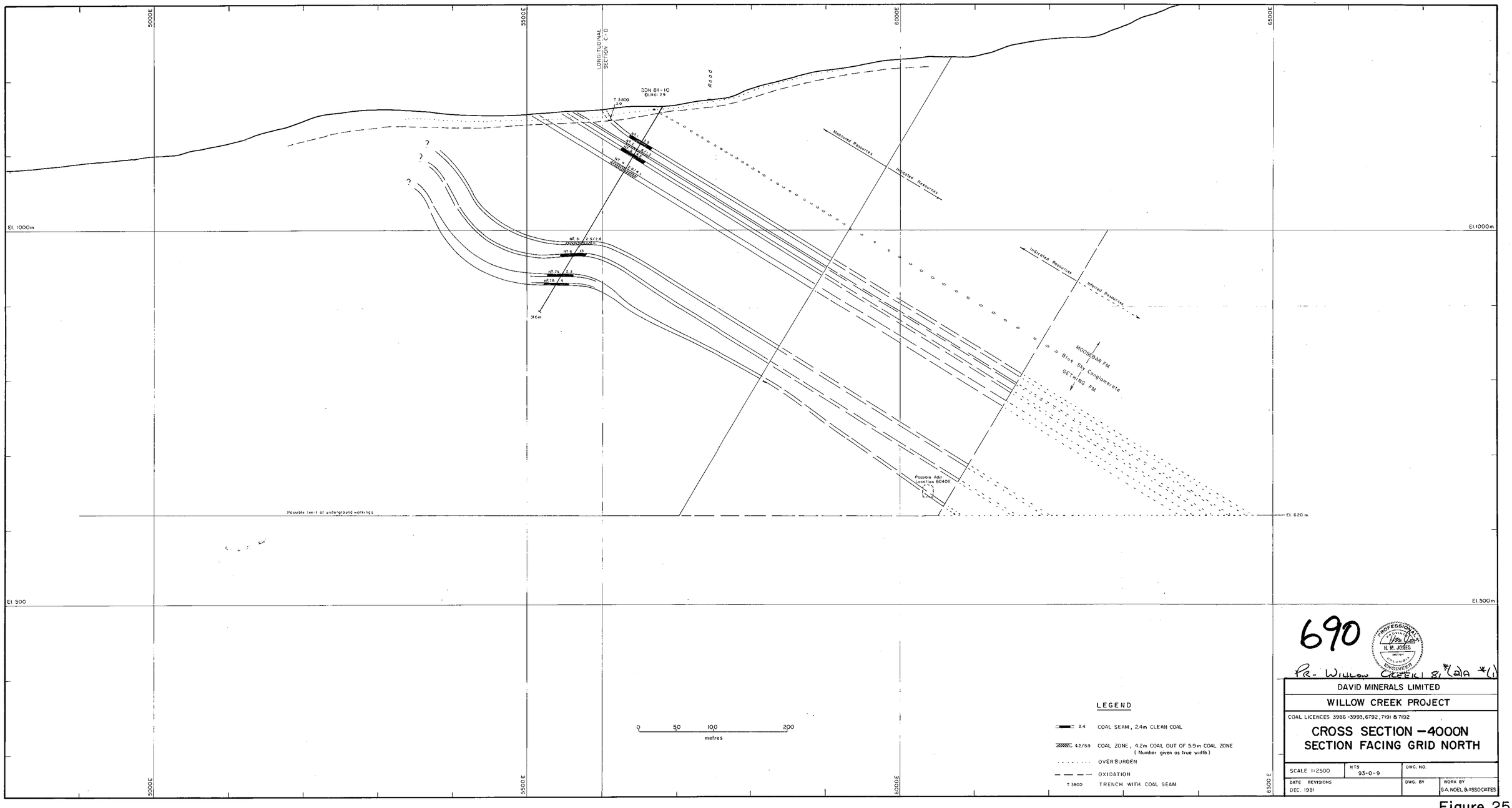

5000E
5500E
6000E
6500E
LONGITUDINAL SECTION C-D
Road
DDH 81-46
El. 1141.3 (approx.)
DDH 81-17
El. 1155.37 (approx.)
El. 1000m
Structure inferred
SHEAR ZONE
158.5m
337.1m
Measured Resources
Indicated Resources
Inferred Resources
MOOSEBAR FM.
Blue Sky Conglomerate
GETHING FM.
Possible Adit Location 6044E
Possible limit of underground workings
El. 620 m
El. 500
0 50 100 200
metres
LEGEND
2.4 COAL SEAM, 2.4m CLEAN COAL
4.2/5.9 COAL ZONE, 4.2m COAL OUT OF 5.9m COAL ZONE (Number given as true width)
OVERBURDEN
OXIDATION
690
Re- Willow Creek 81-1(2)A *(1)
DAVID MINERALS LIMITED
WILLOW CREEK PROJECT
COAL LICENCES 3986-3993, 6792, 7191 & 7192
CROSS SECTION -4200N
SECTION FACING GRID NORTH
SCALE 1:2500
NTS 93-O-9
DWG. NO.
DATE REVISIONS DEC. 1981
DWG. BY
WORK BY G.A. NOEL & ASSOCIATES

Figure 24



690

Re- Willow Creek 81/82a #(1)

PROFESSIONAL ENGINEER H. M. JONES

DAVID MINERALS LIMITED

WILLOW CREEK PROJECT

COAL LICENCES 3986-3993, 6792, 7191 & 7192

CROSS SECTION – 4000N
SECTION FACING GRID NORTH

SCALE 1:2500	NTS 93-O-9	DWG. NO.
DATE REVISIONS DEC. 1981	DWG. BY	WORK BY G.A. NOEL & ASSOCIATES

Figure 25

INFERRED

INDICATED

HYPOTHETICAL

INDICATED

INDICATED

46,613,190 MEASURED

INFERRED

INFERRED

LEGEND

- Measured coal resources
- Indicated " "
- Inferred " "
- Hypothetical " "

West boundary – Up dip intersection of coal zones with ground surface
East boundary – Down dip intersection of coal zones with 620m. elevation projected to surface.

G.N. 46°16'41" T.N. 122°12'

0 200 metres

690

Survey by McElhaney, Nov. 1981 (Preliminary Map)

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA A. M. JONES

DAVID MINERALS LIMITED

WILLOW CREEK PROJECT

COAL LICENCES 3986-3993, 6792, 7191 & 7192

Pr-Willow Creek 81 #(2)A #(1)

COAL RESOURCES

SCALE 1:5000	NTS 93-0-9	DWG. NO.	
DATE REVISIONS DECEMBER 1981		DWG. BY	WORK BY G.A. NOEL & ASSOCIATES

Figure 30

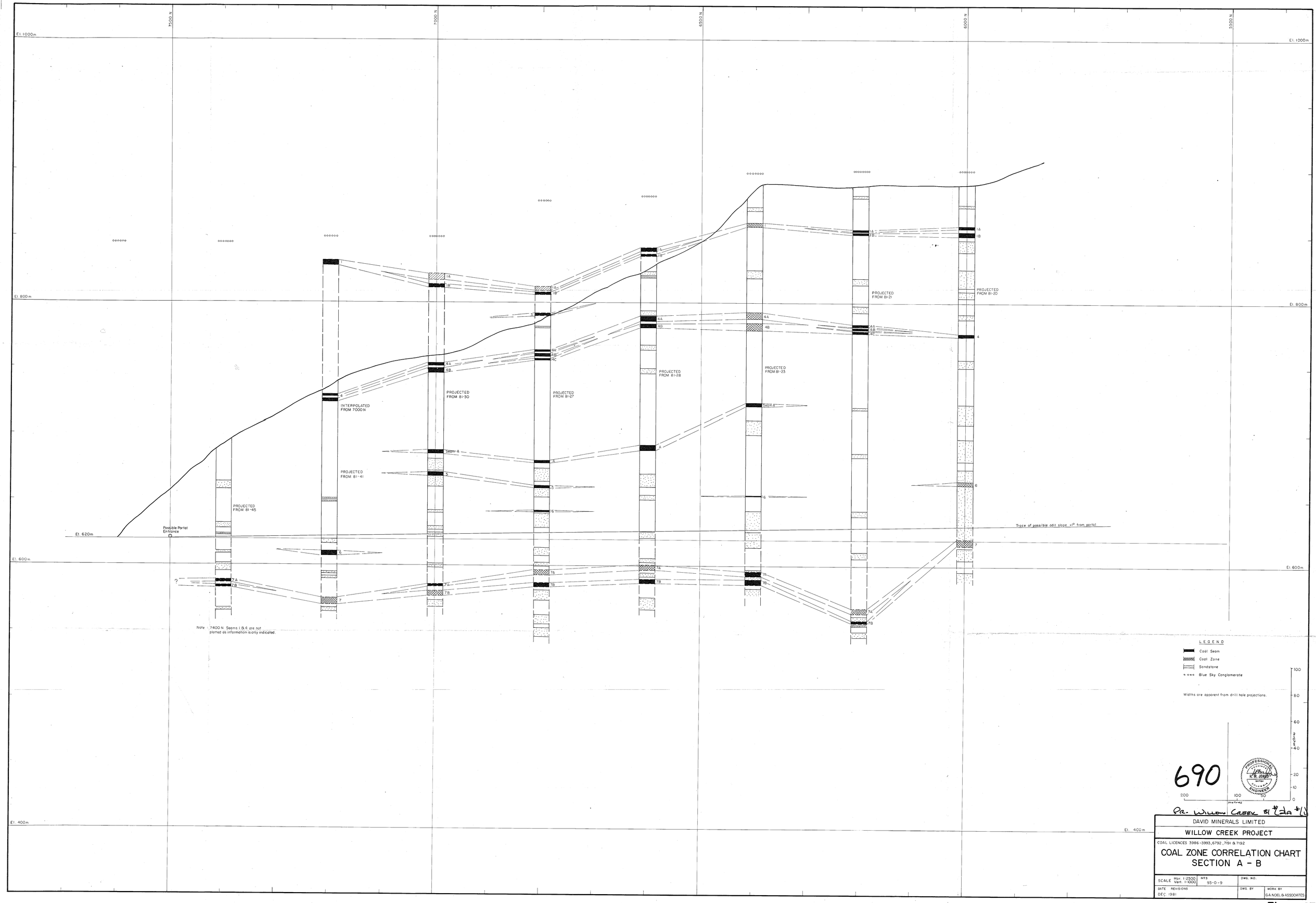

7500 N
7000 N
6500 N
6000 N
5500 N
El. 1000m
El. 800m
El. 620m
El. 600m
El. 400m
Possible Portal Entrance
Trace of possible adit slope +/- from portal
PROJECTED FROM 81-41
PROJECTED FROM 81-45
INTERPOLATED FROM 7000N
PROJECTED FROM 81-30
PROJECTED FROM 81-27
PROJECTED FROM 81-28
PROJECTED FROM 81-25
PROJECTED FROM 81-21
PROJECTED FROM 81-20
Seam 4
Note: 7400 N Seams 1 & 4 are not plotted as information is only indicated.
LEGEND
Coal Seam
Coal Zone
Sandstone
Blue Sky Conglomerate
Widths are apparent from drill hole projections.
100
80
60
40
20
10
0
metres
690
200
100
metres
PROFESSIONAL ENGINEER
H. M. JONES
BRITISH COLUMBIA
DAVID MINERALS LIMITED
WILLOW CREEK PROJECT
COAL LICENCES 3986-3993, 6792, 7191 & 7192
COAL ZONE CORRELATION CHART
SECTION A - B
SCALE Hor. 1:2500 Vert. 1:1000
NTS 93-O-9
DWG. NO.
DATE REVISIONS
DEC 1981
DWG. BY
WORK BY
G.A. NOEL & ASSOCIATES

Figure 27

Pr- Willow Creek 81*(2)A *(1)

DAVID MINERALS LIMITED

WILLOW CREEK PROJECT

COAL LICENCES 3986-3993, 6792, 7191 & 7192

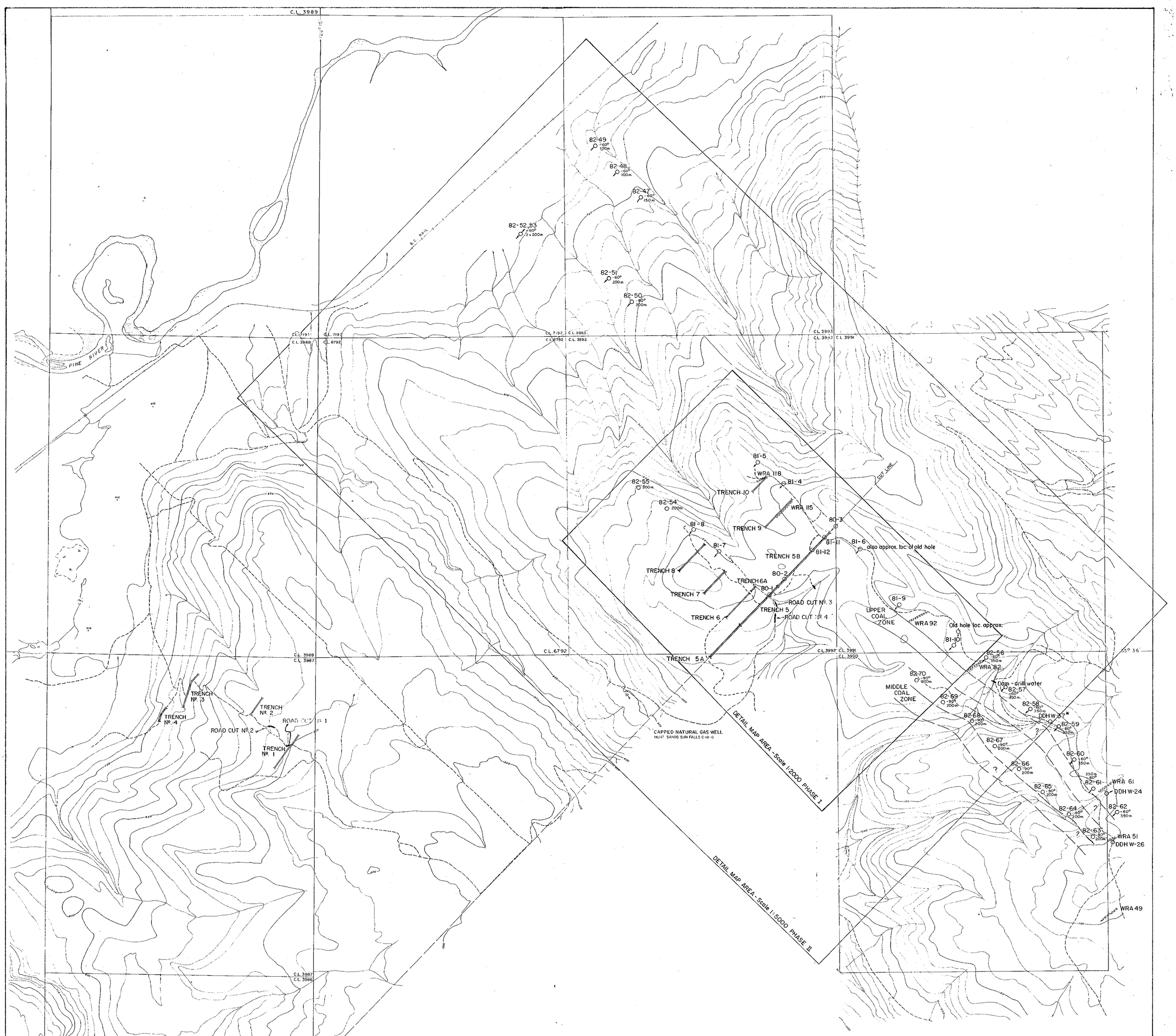
COAL ZONE CORRELATION CHART
SECTION C-D

SCALE Hor. 1:2500 Vert. 1:1000	NTS 93-O-9	DWG. NO.	
DATE REVISIONS DEC. 1981		DWG. BY	WORK BY G.A. NOEL & ASSOCIATES

690

PROFESSIONAL ENGINEER H. M. JONES PROVINCE OF BRITISH COLUMBIA

Figure 28



LEGEND

- 80-2 — COLLAR - DIAMOND DRILL HOLE PHASE I
- TRENCH 7 — BACK HOE TRENCH
- WRA 82 — OLD B.C.D.M. TRENCH
- ACCESS ROAD
- DAM FOR DRILL WATER
- DDH W-34 — OLD B.C.D.M. DRILL HOLE - LOCATION APPROX.

* NOTE - DDH W-37 is suspect. Information taken from McKechnie's report. Topo map & section do not correspond.

PHASE III A 82-47 to 82-55

PHASE III B 82-56 to 82-70

690

Pre-Willow Creek 81/12/8 *1

PROFESSIONAL ENGINEER H. M. JONES BRITISH COLUMBIA

DAVID MINERALS LIMITED		
WILLOW CREEK PROJECT		
COAL LICENCES 3986-3993, 6792, 7191 & 7192		
PHASE III PROPOSED EXPLORATION PROGRAM		
SCALE 1:10,000	NTS 93-O-9	DWG. NO
DATE/REVISIONS DECEMBER 1981	DWG BY	WORK BY G.A. NOEL & ASSOCIATES

Figure 31