

CONFIDENTIAL

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

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CONFIDENTIAL

1983 EXPLORATION WORK

THE GEOLOGY AND COAL RESOURCES OF THE ANDERSON WEST COAL LICENCES
CUMBERLAND COAL FIELD, COMOX LAND DISTRICT

Lat. 49 deg. 41' TO 49 deg. 44'

Long. 125 deg. 09' TO 125 deg. 10'

EAST CENTRAL VANCOUVER ISLAND

BRITISH COLUMBIA

COAL LICENCE Nos. 7472, 7473, 7474, 7475, NTS Sheet 92F/11

Prepared For :

WELDWOOD OF CANADA LIMITED
VANCOUVER, BRITISH COLUMBIA

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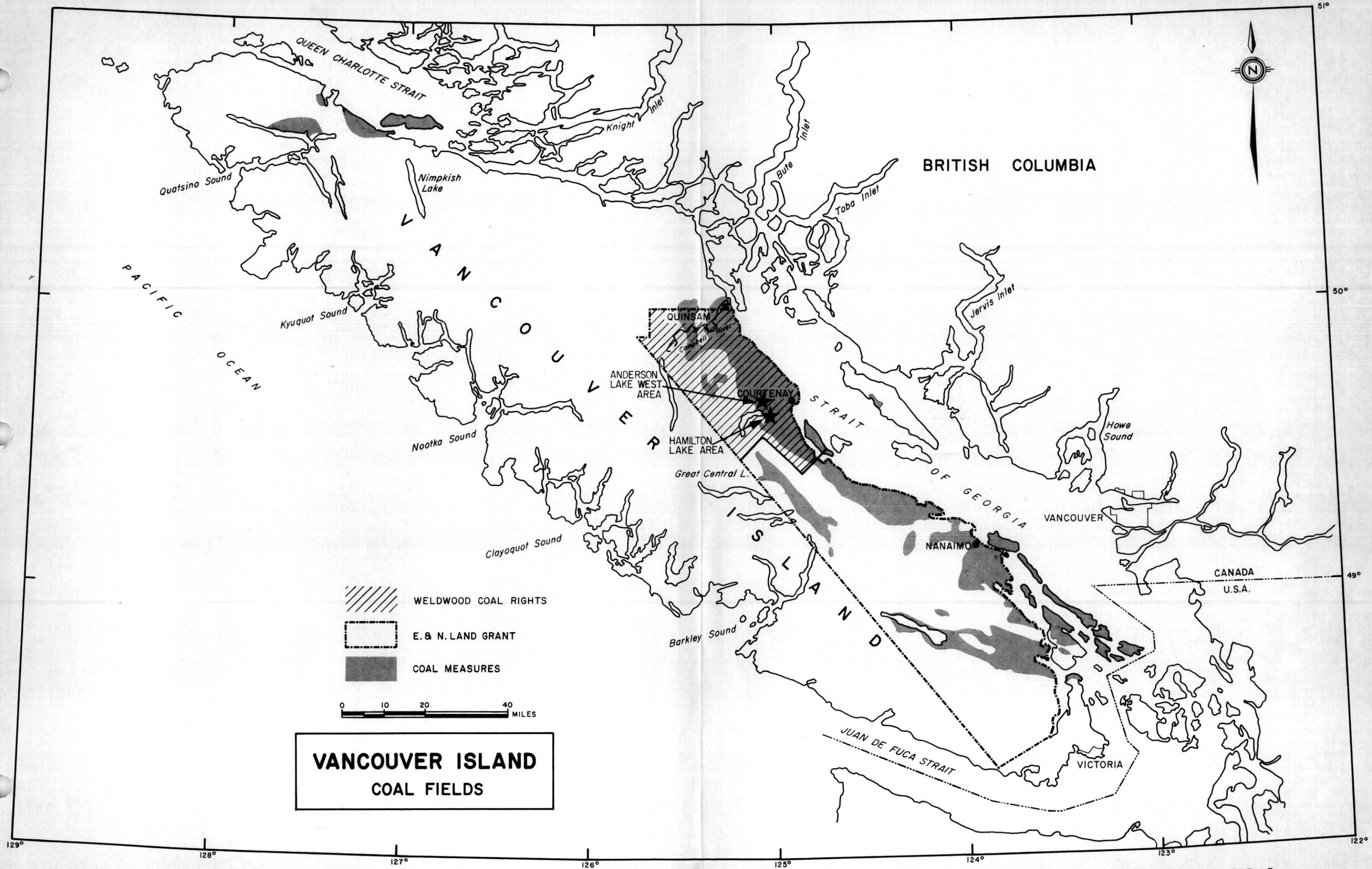
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**VANCOUVER ISLAND
COAL FIELDS**

FIG 1

1.0 INTRODUCTION

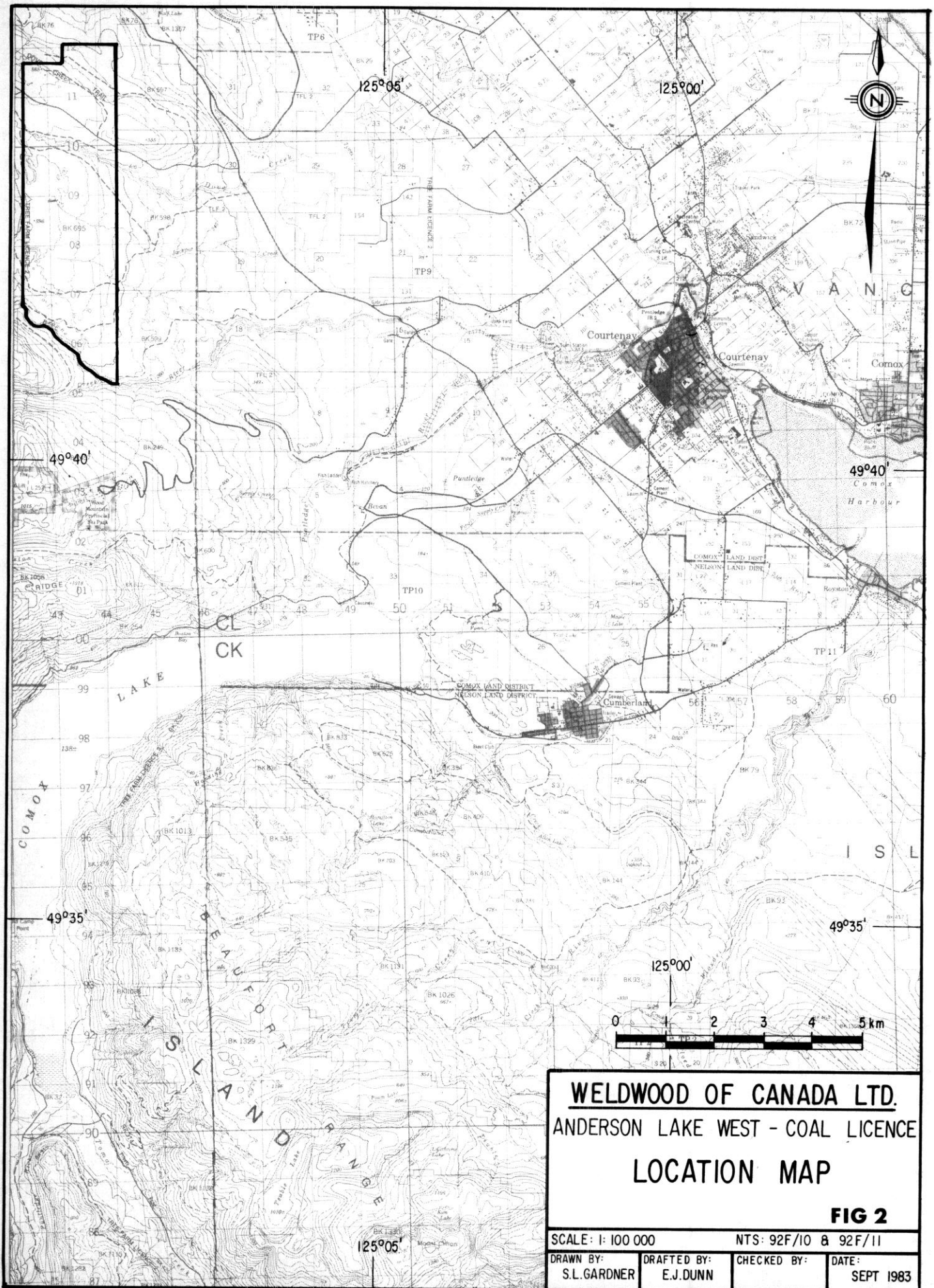
1.1 Location and Description of the Anderson West Licence Area.

The Anderson West Coal Licences, held by Weldwood of Canada Ltd., are located approximately 8 km. (5 mi.) northwest of the city of Courtenay, B.C. approximately mid-way up the east coast of Vancouver Island. They consist of Coal Licence Nos. 7472, 7473, 7474, and 7475 covering a total area of 808 hectares. This area is found on NTS Map 92 F 11 at Longitude $125^{\circ} 10'$, Latitude $49^{\circ} 42'$.

The Anderson West licence area is accessible from Courtenay via the main Crown Zellerbach logging road which runs from the C Z Camp west of Courtenay, north to Dove Creek. A secondary logging road turning west and paralleling the south bank of Dove Creek affords access to the eastern edge of the licence area.

The south part of the licence area is relatively accessible by road. The central and northern parts of the licence area are not accessible due to the current state of disrepair of various bridges and culverts. A certain amount of upgrading and road maintenance would be required in this area in order for large equipment such as drilling rigs to enter.

The total road distance from the Anderson West coal licences to the old Union Bay shipping wharf is 29 km. (18 mi.).



WELDWOOD OF CANADA LTD.
ANDERSON LAKE WEST - COAL LICENCE
LOCATION MAP

FIG 2

SCALE: 1: 100 000 NTS: 92F/10 & 92F/11

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3.0

GEOLOGY

3.1 Regional Stratigraphy and Structure

The Comox Coal Basin, which is located in the Comox-Cumberland area on the east coast of Vancouver Island, covers part of the Vancouver Island Lowlands Belt. This long narrow belt of low, flat-lying topography covers an area approximately 16 kilometres wide by 60 kilometres long stretching from the Campbell River District south to the Nanaimo area. The Lowlands Belt is flanked by the Beaufort Mountains on the west. The Beaufort Range forms the backbone of Vancouver Island.

Volcanism and uplift associated with volcanic island building during Jurassic, Triassic and into Cretaceous time created an island arc complex which eventually emerged to form what is Vancouver Island today. This prolonged period of island building triggered a massive erosional-depositional sequence in Late Cretaceous time during which sedimentary deposits washed off the flanks of the Beaufort Range and were deposited along the island margins, extending the coastline seaward. This is termed the Nanaimo Series.

The Nanaimo Series, which is Late Cretaceous in age, is made up of a number of transgressive-regressive cycles of deposition governed by the rise and fall of sea level throughout the Late Cretaceous period. Each cycle consists of a range of coarse clastic continental sediments to fine-grained marine shales. The coal measures of the Comox Formation are contained in the first depositional cycle and rest unconformably on the pre-Cretaceous volcanic basement rock of the Karmutsen Formation. In certain paleotopographically low areas, the beginning of Comox Formation deposition is marked by a basal conglomeratic facies called the Benson Member. The

..... 3.1 Stratigraphy P. 2

Benson Member consists of large pebbles and cobbles of angular to sub-rounded cherts and basalts well-cemented in a medium to coarse grained green sandstone matrix.

Throughout the Cretaceous Age and into Tertiary time, acid volcanic intrusions, called the Island Intrusions, periodically erupted. These acid volcanics intruded through the Triassic basement rock and penetrated the Cretaceous sediments to form sills, dykes and occasionally surfacing as laccoliths. An example of one of these Tertiary volcanic emplacements is Constitution Hill, a major topographic feature that occurs a short distance north and west of the Comox Coal Basin. Because of the younger age of these volcanics, they can be in direct contact with the older Comox Formation sediments, including the coal measures. In these localized instances, the volcanics have hypothermally altered the coal seams to form natural coke, with a halo of low volatile coal surrounding the contact zone. The Anderson West licence area may be an example of this phenomenon.

3.2 Surficial Geology - Anderson West Area

The surficial geology of the Anderson West area is a result of its physiographic setting. A thin layer of glacial overburden blankets the top part of the plateau area. Small drainages through this area are able to erode through the till blanket and expose the Comox Formation sandstones and shales below. In general however, the thick undergrowth and tree cover on the top of the plateau and down the sides mask most of the bedrock outcrops. The major valleys, such as the Brown's River to the south and Dove Creek to the north have been subjected to a large amount of glacial deposition because of their lower elevations. Till thicknesses increase dramatically in these areas and in some cases, till is in direct contact with the old Triassic basement volcanic rock.

The glacial till consists of a normal sequence of orange - brown weathering sandy clay interspersed with numerous cobbles, pebbles and boulders of granite, basalt and chert.

3.3 Geology of the Coal Measures

The Anderson West Licence Area is situated on the northwestern extremity of the Cumberland coal field. Its distal location and the high elevations of the area relative to the producing part of the field indicates that its origin and environment of deposition was not conducive to the slow, uniform accumulation of plant debris and vegetal matter associated with the low - lying coastal swamps and lagoonal facies of the Cumberland area. This has been borne out by the existing drillhole information and field mapping. Present data indicates rapid facies changes and higher energy environments. Coal seam generation was limited to very small oblate areas - seams are badly split and the coal bands are characterized by high ash and abundant dirt bands.

In the southern part of the area, seam correlations between holes is difficult. The most well-developed seam occurs near the top of the section. This seam outcrops a short distance southwest of Hole AL - 78 - 16c in a road-cut. The floor of the seam was not exposed, however the upper part of the seam consisted of a dull and bright banded type of coal with a platy fracture, interspersed with mudstone and shale partings. Hole 78 - 16c shows this seam to be .70 m. (2.30 ft.) of coal underlain by .52 m. (1.70 ft.) of coal and shale mixed, for a total seam section of 1.22 m. (4.00 ft.) . The quality of this seam is discussed under Section 4.0.

A second seam lying approximately 3.5 m. below the main seam is measured as .73 m. (2.3 ft.) of shaley coal mixed with shale in Hole 78 - 16. The density curve shows this coal to be higher in ash than the main seam, however

NNW

SSE

AL-78-29

AL-78-20c

AL-78-26c

ANDERSON No. 4

ANDERSON No. 3

AL-78-15

AL-78-13

AL-78-11

SHALE OUT

DATUM
UPPER COAL SEAM

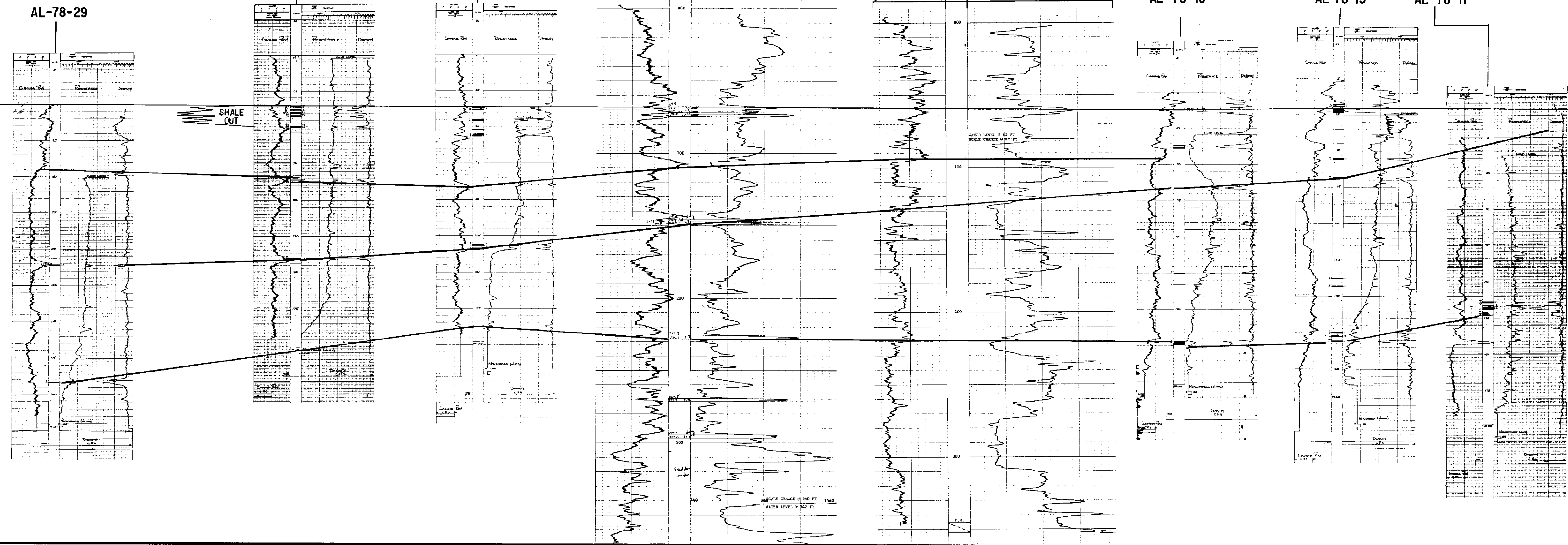


FIG 3

WELDWOOD OF CANADA LTD.
 ANDERSON WEST COAL LICENCES
 LONGITUDINAL SECTION
 NNW - SSE

SCALE: HORIZONTAL 1:6000, VERTICAL 1:500
 DRAWN BY: S.L. GARDNER
 DRAFTED BY: E.J. DUNN
 CHECKED BY: []
 DATE: SEPT 1983

..... 3.3 Geology of the Coal Measures P.2

it is possible that due to the shallow depths involved it could be mined also.

A number of very thin seams occur in the Comox Formation section below these two seams, and although they are traceable over most of the southerly part of the licence area in the drilling (see Appendix), their thinness, poor quality and depth of cover make them unattractive.

In the northern part of the licence area (south of the Dove Creek Valley) a coal zone occurs within the top 13 meters in holes AL - 78 - 20 and AL - 78 - 21. Figure shows that this seam is correlative to the two seams found close to the surface in the south part of the licence block although their characters differ markedly. This seam in Hole AL - 78 - 21 is measured as follows :

.37 m.	COAL
.21 m.	SHALE
.27 m.	COAL
.06 m.	SHALE
.27 m.	COAL
.27 m.	SHALE
.21 m.	COAL, high ash
.09 m.	SHALE
.21 m.	COAL, high ash
.61 m.	SHALE
.24 m.	COAL

TOTAL COAL: 1.15 m. (3.8 ft.)

TOTAL HIGH ASH COAL: .42 m. (1.4 ft.)

TOTAL SHALE : 1.24 m.

TOTAL SEAM SECTION : 2.81 m.

..... 3.3 Geology of the Coal Measures P. 3

A normal fault is interpreted to occur on the northeast side of this northerly deposit of potentially economic coal. (See Appendix II, Section 36 + 80). This normal fault essentially provides a boundary for the deposit in this direction as holes on the northeast or downthrown side of the fault intersected the seam at depth or did not intersect it at all.

The environment of deposition of the Anderson West Licence Area appears similar to that of the Hamilton Lake area South of Cumberland. In both areas, a number of thin seams are present, however at Hamilton Lake their continuity is more pronounced, whereas in the Anderson West area the lower seams tend to disappear in a lateral direction quite rapidly.

1.2

PHYSIOGRAPHY

The Anderson West Licence area covers a high plateau that overlooks the broad Comox Valley to the east and south-east. This plateau area is called Anderson Hill. Anderson Lake and a few other smaller lakes are located on the top of this plateau area. The Forbidden Plateau ski area is located 5 km. (3 mi.) due south of the licences.

The topography over the licence area ranges from 250 to 600 meters above sea level (800 to 2000 ft. a.s.l.). In general the licence area, and especially those parts which are considered to contain potentially economic coal reserves, are found on the east side of the rather steeply rising hill that crests on the west central portion of the coal licences.

The north part of the licence area is drained by Dove Creek, which flows into the Tsolum River some distance east of the property. In this area the Dove has cut a steep-sided valley up to 100 meters deep. The south part of the licence area is drained by a number of small southerly flowing tributaries of the Brown's River.

1.3 SUMMARY OF WORK TO DATE

1975 : Weldwood of Canada Limited completed a regional study of Coal Resources, including Anderson West Area. A total of 7 drillholes (labelled Anderson No. 1 to Anderson No. 7 inclusive) were completed on what is now Coal Licence Nos. 7472, 7473, and 7474. Total metrage of this program was 942 metres. These drillholes were geophysically logged. No coring was undertaken (for locations see Appendix Map I). The geophysical logs for these holes are included in Appendix III. No driller's logs are available.

1978 : Weldwood of Canada Limited completed drilling and coring on several of the areas under licence, including Anderson West Licences 7472, 7473, 7474 & 7475. Holes drilled on these licences include 78-12 to 78-28 inclusive (for locations see Appendix Map I), for a total of approximately 1000 metres. The coal sections in Hole 78-16C were cored. Holes were geophysically logged. Driller's logs and geophysical logs for these holes are included in Appendix III.

1983 : Surface mapping on a scale of 1 : 7,500 was carried out over an area of 1 sq. km. on coal licence 7474. This mapping identified three outcrops of coal along the southwest outcrop edge of the deposit. Mapping also determined the volcanic-sedimentary contact in this area.

1.4 COST SUMMARY, 1983 WORK

The following is a cost summary of the work performed :

ON-PROPERTY COSTS :

Surface Mapping	\$ 1,406.68
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OFF-PROPERTY COSTS:

Final reporting and interpretations.....	\$ 2,100.00
Drafting and reproduction	\$ 905.92
Office and miscellaneous	\$ 100.89

TOTAL EXPENDITURE* \$ 4,513.49

*NOTE : DOES NOT INCLUDE HEAD OFFICE AND ADMINISTRATION

0.1 SCOPE OF PRESENT WORK

ADD TO SECTION 1.4 ON PAGE 4 OF REPORT

Surface mapping on a scale of 1 : 7,500 was carried out over an area of 1 sq. km. on coal licence no. 7474. This mapping identified three outcrops of coal along the southwest outcrop edge of the deposit. Mapping also determined the volcanic-sedimentary contact in this area.

1.5 COST SUMMARY

The following is a cost summary of the work performed:

ON-PROPERTY COSTS

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Final report preparation \$ 2,100.00

Drafting and Reproduction \$ 905.92

Office and Miscellaneous \$ 100.89

TOTAL EXPENDITURE* \$ 4,513.49

*NOTE : DOES NOT INCLUDE HEAD OFFICE AND ADMINISTRATION

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2.0

SUMMARY AND CONCLUSIONS

The Anderson West Coal Licences, held by Weldwood of Canada Ltd., are located on a high plateau area overlooking the Comox Valley approximately 8 km. north west of the city of Courtenay, B.C.

Previous drilling conducted by Weldwood in 1975 and 1978 identified a number of thin coal seams occurring in the lowermost 100 to 200 meters of the Comox Formation, which is the main coal-bearing formation in the area. Only the uppermost of these seams has economic potential.

Two relatively small areas, termed the north and south coal reserve areas, contain a total of 1,675 million metric tonnes of coal in place with an overburden to coal ratio of approximately 10 : 1. This reserve total is contained in the upper seam, with a maximum cover depth of 15 meters.

In view of the shallow depth of cover and the relatively small nature of the coal reserve, a small scale stripping operation that could be compared to a gravel pit operation may make economic sense, providing preparation plant facilities and other infrastructure such as load-out facilities are available. With this in mind, an exploration proposal based on grid pattern drilling and coring work is recommended in order to bring the property to one of two alternate situations : a.) a holding pattern lease until such time as other areas are producing, or b.) a limited production permit application, the approval of which would allow the licences to feed into other facilities or operations at the rate of 50,000 tonnes per annum.

4.0

COAL QUALITY

During the 1978 drilling on the property, the main seam was cored in only two locations: Hole AL - 78 - 20c on the North Block and Hole AL - 78 - 16c on the South Block (see Appendix Map I). These two cores give some preliminary indication of coal quality, however, more data points are required before quality parameters for recoverable coal can be predicted with any degree of confidence. The two initial coreholes do provide some fundamental information with regards to general raw coal quality trends:

- a) The main seam in both areas is a high ash seam.
- b) Inherent moisture contents in both areas are very low.
- c) The coal is a low volatile variety, but high in fixed carbon.
- d) Sulphur contents are variable but in general the South Block or Block 'B' area is low in sulphur, where as the North Block (Block 'A') area is high in sulphur.
- e) Coking tests were only run on Hole 16c (South Block) and show that the coal is non-agglomerating.

These general trends in quality indicate that the coal has been subjected to a rank increase by way of transformation by heat and pressure. This is the result of volcanic activity occurring close to the coal deposit since the time it was generated. The most obvious example of younger volcanic activity in the area is Constitution Hill, a massive upwelling of acid volcanics that occurred in the Tertiary Period. The radiation of heat and pressure from this source altered the coal by driving off most of the gaseous and reactive components in the coal (the volatile matter) and much of the inherent moisture, leaving a high carbon content coal but with no coking characteristics. According to the A.S.T.M. classification,

..... Coal Quality P.2

the coal is on the boundary of low to medium volatile bituminous coal.

If these trends are proven out with additional coring work, the quality of the coal would necessitate blending with other coals in order to produce a marketable product.

AL-78-16c

RAW COAL ANALYTICAL DATA

MOISTURE	ASH	VOLATILE MATTER	FIXED CARBON	SULPHUR	CALORIFIC VALUE	THICKNESS (m)
0.24	17.72	17.35	64.69	1.10	12567	0.50
0.37	69.75	16.60	13.28	0.28	2873	0.59

0.25	26.80	20.42	52.43	0.76	10968	0.25
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FLUID LEVEL

← CASING

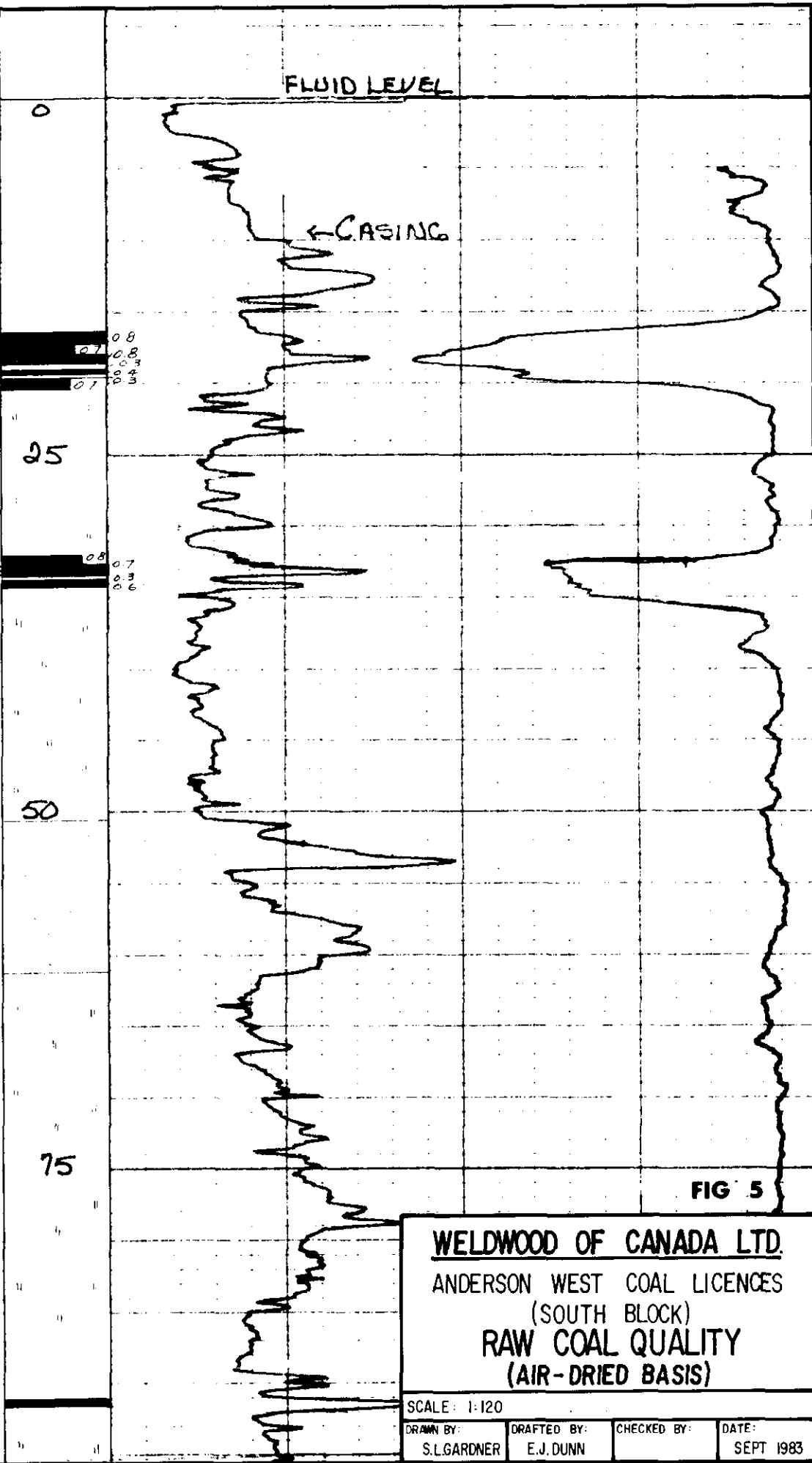


FIG 5

WELDWOOD OF CANADA LTD.
 ANDERSON WEST COAL LICENCES
 (SOUTH BLOCK)
 RAW COAL QUALITY
 (AIR-DRIED BASIS)

SCALE: 1:120

DRAWN BY: S.L.GARDNER	DRAFTED BY: E.J.DUNN	CHECKED BY:	DATE: SEPT 1983
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AL-78-20c

RAW COAL ANALYTICAL DATA

MOISTURE	ASH	VOLATILE MATTER	FIXED CARBON	SULPHUR	CALORIFIC VALUE	THICKNESS (m)
0.32	51.99	12.39	35.30	9.00	6196	0.62
0.38	35.83	12.50	51.29	1.98	9458	0.59
0.25	28.07	16.90	54.78	2.00	10692	0.30
0.20	13.33	18.20	68.27	2.08	13533	0.30

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1.1
1.2
0.9
0.9
1.3
0.4
0.8

0.6
0.2
0.6

0.8
0.5
0.3

FIG 4

WELDWOOD OF CANADA LTD.
ANDERSON WEST COAL LICENCES
(NORTH BLOCK)
RAW COAL QUALITY
(AIR-DRIED BASIS)

SCALE: 1:120

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S.L. GARDNER

DRAFTED BY:
E.J. DUNN

CHECKED BY:

DATE:
SEPT 1983

Figure 4 illustrates raw coal quality of the upper seam in hole AL - 78 - 20c (the North Block). Separate analyses of each coal bench indicates that the sulphur content is extremely high in the upper part of the seam and remains high at 2 % throughout the remainder of the seam. These analyses indicate that there is a total of 1.2m. (3.9 ft.) of clean coal, the remainder of the seam containing more than 50% ash content.

Figure 5 indicates that in hole AL - 78 - 16c (representing the south block of licences), the upper seam contains a lower sulphur content of about 1%. Most of the other parameters remain the same. A total clean coal thickness of .79 m. (2.59 ft.) is indicated by the analytical data, the remainder of the seam being high in ash content.

5.0 Coal Reserves

The 1978 report on the Anderson West Coal Licences estimated a total of 4.4 million short tons of coal on the licence area. This estimate is broken down as follows:

<u>Seam Thickness (ft.)</u>	<u>Seam Area (sq.ft.)</u>	<u>Total Short Tons</u>
North Block ('A') 3.03	20,750,000	2,800,000
South Block ('B') 2.88	12,428,000	1,640,000

This tonnage occurs in the upper seam, which is on the average within 35 ft. (10.7 m.) of the surface on the north and south blocks. This gives a total in-place overburden to clean coal ratio of less than 10 : 1 for both of the upper seam deposits.

The current investigation has led to a downsizing of the in-place reserve, largely as a result of the reduction in area of both the south and north deposits. This reduction in area is dictated by a re-evaluation of the geophysical curves with respect to coal quality analytical data presented in the 1978 report ; while the seam is evident on the logs as covering quite a large area, the poor attenuation of the density curve indicates that the coal in some areas is extremely high in ash. This results in poor clean coal recoveries and the seam is deemed to be uneconomic in these instances. Also in certain areas the total overburden to coal ratio would exceed 10 : 1 cut off as specified in the 1978 report would seem to be a reasonable economic cut-off, especially in consideration of the quality of the coal.

5.1 Coal Reserves - North Block (Block 'A')

In the north part of the Anderson West Licence Area, two boreholes intersected a coal zone of a thickness that may accommodate commercial production. These are holes AL - 78 - 21 and AL - 78 - 20. Hole 78 - 20 was cored for quality analysis, the results of which are discussed in Section 4.0. This main coal zone, which is the uppermost zone in the stratigraphic section in this area, occupies an area along the side of the hill that crests on the southeast side of Anderson Lake. Because the depth to the coal is generally less than 15 meters, it may accommodate a small, economically viable surface pit. Section 36 + 80 N (Appendix) illustrates the attitude of this coal zone relative to the surface topography. It can be seen that the dip of the coal approximates the dip of the hillside, affording relatively easy access for approximately 1100 meters of length. Limited drilling to the north shows that the seam shales out and disappears in this direction (see hole AL - 78 - 29). This phenomenon probably occurs to the south, although the exact boundary can not be defined due to the scarcity of drill data.

Appendix Map I illustrates a reasonable projection of the area containing this main seam. Using these boundaries and assuming an average clean coal thickness of 4.5 ft. from the present drillhole information, an estimate of coal reserves for this area is as follows:

- Total Area : 585,000 sq. m.
= 6,297,094 sq. ft.
= 144.56 acres , say 145 acres
- Assume a 10° average dip on the coal
- Assume an average thickness of 4.5 ft. of clean coal 8,335 short tons per acre x 145 acres
- 1,208,541 short tons or 1,096,680 metric tonnes
IN PLACE

5.2 Coal Reserves - South Block

A coal occurrence similar to that on the north part of the Anderson West licence Area occurs on the southern part of the area. In the southern part, two coal seams occur within 15 meters of the surface and parallel the dip of the topography to the east. These seams are best represented in Hole AL - 78 - 16. The two seams thin and splay apart to the east, so that on the eastern edge of the projected reserve area, only the uppermost of the two is economically recoverable. Using the projected reserve boundaries as interpreted from the drill hole logs and the sections contained in the Appendix the following in - place reserve estimate can be made for this area :

- Assume a total area of economic coal reserve of 114 acres.
 - Assume an average coal thickness of 3.0 ft. of clean coal.
 - Assume an average dip of 10° on the coal.
 - Assume a total of 5556.51 short tons / acre
- . . 5556.51 tons / acres x 114 acres
 = 633,442 short tons
 or 574,811 metric tons say 575,000 metric tons in place

In summary, a total of 1,675,000 metric tonnes (1,846,000 short tons) of potentially economic coal occurs in place on the Anderson West Licence Block. This in-place coal reserve is all within a total overburden to coal ratio of approximately 10 : 1.

6.0 Conclusions and Recommendations

As a result of the present study, a number of conclusions are drawn:

1.) The Anderson West Licence Block contains a number of seams of coal throughout a total section of the Comox Formation of 100 meters or more. Only the uppermost seam, which consists of a number of thin coal bands, holds any potential for commercial production.

2.) The total in - place coal reserve in this upper seam on the Anderson West Licence Area is estimated at 1.675 million metric tonnes, 575,000 tonnes of which occur on the south block coal reserve and 1,100,000 tonnes of which occur on the north block coal reserve. This represents a reduction of approximately 60 % from 1978 reserve estimates. While the coal seam definitely occurs over a much greater area than the present calculations employ, the density curves of the boreholes drilled to date indicate that it would be extremely high in ash and uneconomic to recover in these other areas.

3.) The coal is medium to low volatile bituminous coal, with sulphur contents generally 1% or greater. The quality parameters as shown by the two corehole data points would indicate that the coal is definitely a blend coal in order for it to be successfully marketed. However, the two data points do not adequately define raw coal quality, and additional coring is necessary in order to forecast coal product quality.

4.) The economic viability of this coal reserve depends on a number of factors. Among the most important of these are:

a) existing coal production must be in place with unused preparation plant capacity. This existing production is necessary for providing a mainstream feed which could accommodate infusions of raw coal from the Anderson West licences.

b) a limited production permit must be made available by the Provincial Government for development of the coal reserves on the Anderson West Licences to take place. This type of permit allows for production of up to 50,000 tonnes of coal per annum from the property. In consideration of the size of the Anderson West deposits, large scale mining can not be envisioned for this area, and the operations would be more on the scale of a gravel pit or shale pit operation. Moreover, the large outlays of front end capital that are necessary when dealing with the present 4-stage system of mining applications for a large scale operation could not be sustained by the amount of potentially mineable coal in place on the Anderson West licences.

In order to prepare an engineering feasibility study on the Anderson West licences, a program of grid pattern drilling and coring is recommended for the defined areas of potentially mineable coal lying very close to the surface (the north and south areas). The grid spacing is recommended at 150 meters for drillholes and 300 meters for coreholes, as shown on Appendix Map I.

The total amount of proposed work for the Anderson West Coal Licences is as follows :

NORTH BLOCK

Total number of proposed holes is 38, of which 13 are coreholes -

total meters of drilling	=	505
total meters of coring	=	<u>65</u>
	GRAND TOTAL	570
total meters of linecutting	=	4,000

SOUTH BLOCK

Total number of proposed holes is 25, of which 9 are coreholes -

total meters of drilling	=	330
total meters of coring	=	<u>45</u>
	GRAND TOTAL	375
total meters of linecutting	=	2,400

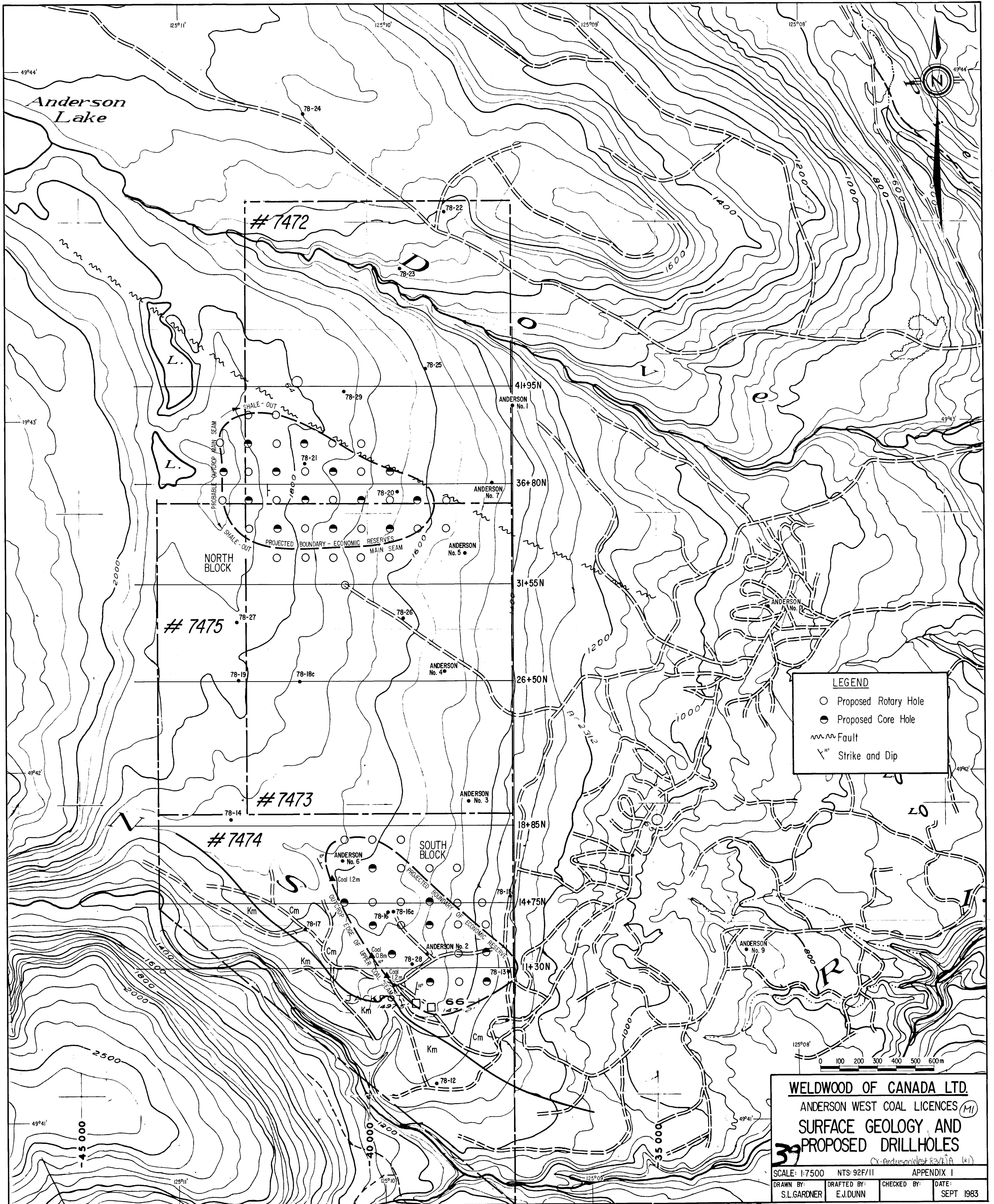
The total amount of expenditure for this work proposal is as follows :

BASE MAP PRODUCTION : ..\$.....	\$ 25,000	
DRILLING : 835 meters @ \$40.00 per meter	\$ 33,000	
CORING : 110 meters @ \$70.00 per meter	\$ 7,700	
BITS, CASING, & CONSUMABLES	\$ 10,000	
GEOPHYSICAL LOGGING: 16 days @ \$500/day	\$ 8,000	
LINECUTTING : 10 days @ \$500/day	\$ 5,000	
CAT SUPPORT : 16 days @ \$600/day	\$ 9,600	
SURVEYING : 20 days @ \$500/day	\$ 10,000	
SUPERVISION : 20 days @ \$400/day	\$ 8,000	
ACCOMODATION : 16 days x 7 men x \$50.00 day	\$ 7,200	
MOBILIZATION - DEMOBILIZATION	\$ 2,500	
LAB ANALYTICAL WORK	\$ 20,000	
REPORTING	<u>\$ 6,000</u>	
	TOTAL	\$152,400
	+ 10% CONTINGENCY	<u>\$ 15,240</u>
	TOTAL PROJECTED COSTS	\$167,640

It is anticipated that upon completion of this work a feasibility study could be undertaken at an approximate cost of \$75,000.000. This feasibility study would provide sufficient information and background data to establish a basis for the application of a limited production permit and/or a holding pattern lease. The holding pattern lease allows operators to maintain a coal reserve area without annual work commitments if the B.C. Department of Energy, Mines and Petroleum Resources approves the submission of data and is satisfied that adequate technical information has been supplied by the operator. In the case of Anderson West, a holding pattern may be desirable in order for the coal reserve to dovetail with another producing operation.

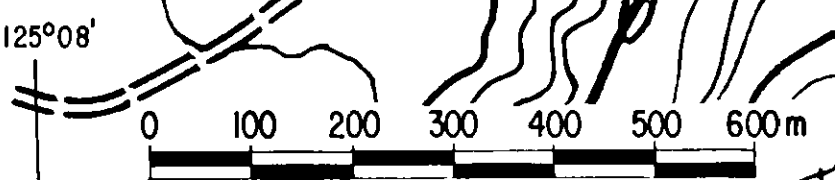
In conclusion, it is the author's opinion that the Anderson West Coal Licences do not in themselves contain a viable economic coal reserve. However, in view of Weldwood of Canada's other coal holdings in the Cumberland area, including coal in the ground and coal contained in waste dumps and tailings piles, the Anderson West licences could become a small but important contributor to a coal preparation facility designed to handle a number of different feeds.

APPENDICES



LEGEND

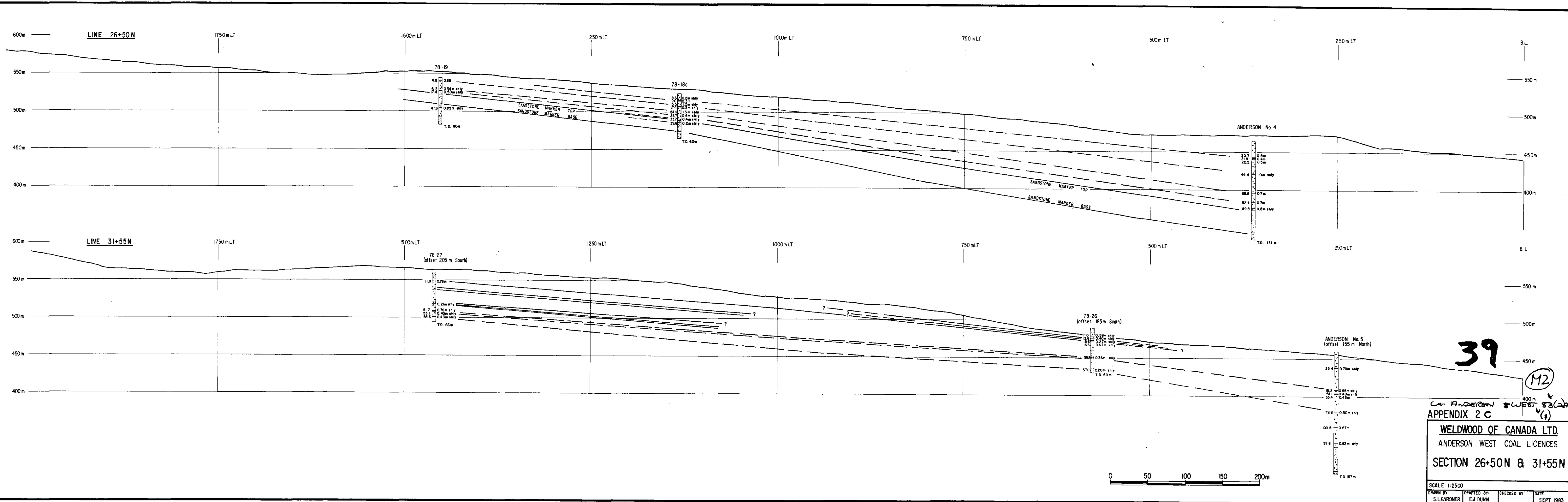
- Proposed Rotary Hole
- Proposed Core Hole
- Fault
- ↘ Strike and Dip

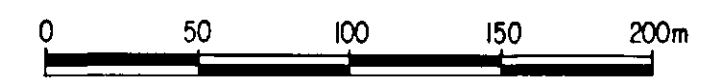
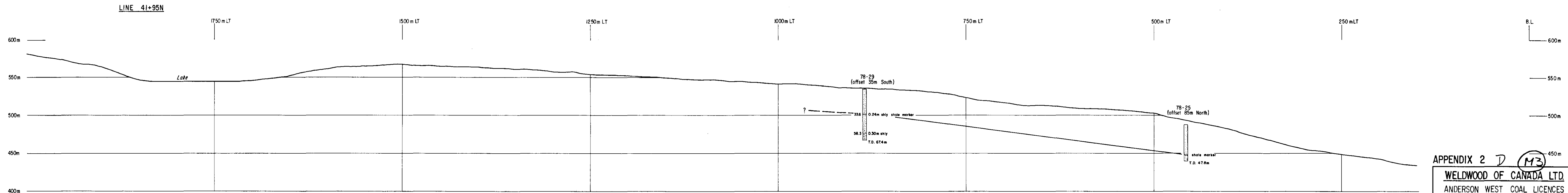
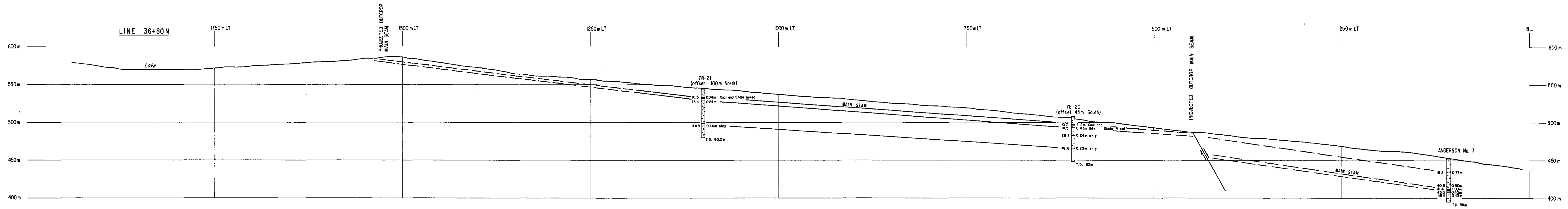


WELDWOOD OF CANADA LTD.
 ANDERSON WEST COAL LICENCES (M)
**SURFACE GEOLOGY AND
 PROPOSED DRILLHOLES**

37

SCALE: 1:7500 NTS: 92F/11 APPENDIX I
 DRAWN BY: S.L. GARDNER DRAFTED BY: E.J. DUNN CHECKED BY: DATE: SEPT 1983





APPENDIX 2 D (M3)

WELDWOOD OF CANADA LTD.
ANDERSON WEST COAL LICENCES

SECTION 36+80N & 41+95N
EX-ANDERSON WEST 83(A) (G)

SCALE: 1:2500

DRAWN BY: S.L. GARDNER	DRAFTED BY: E.J. DUNN	CHECKED BY:	DATE: SEPT 1983
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OX - Anderson West 83(37)A *11

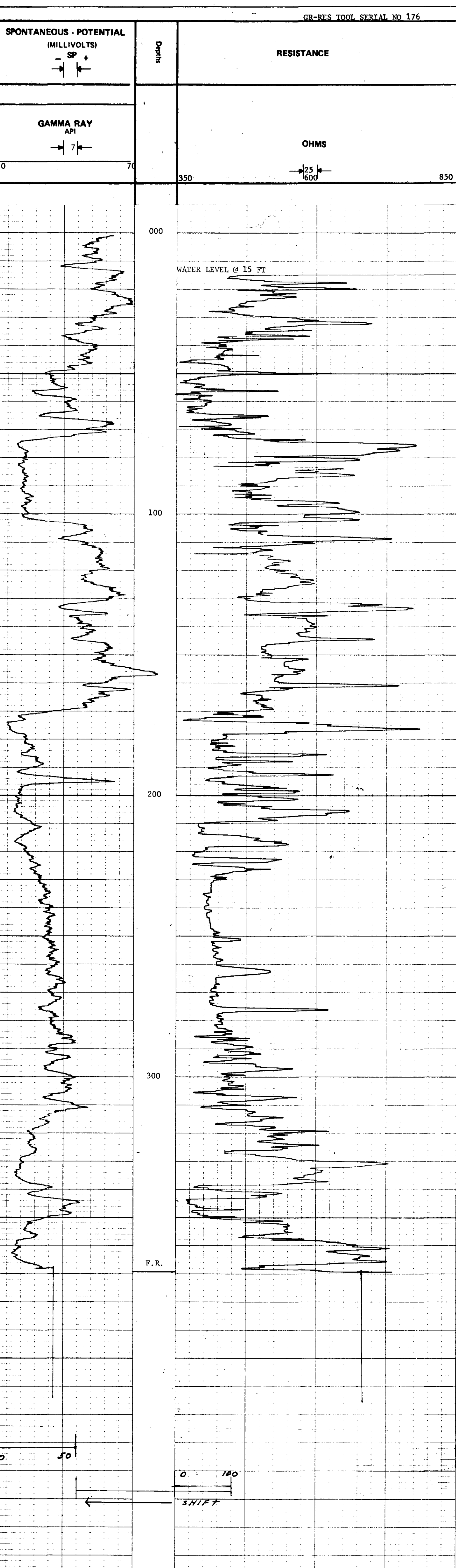
ROKE

GAMMA RAY - RESISTANCE LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.	COMPANY	WEILWOOD OF CANADA LTD
LSD	WELL	ANDERSON LAKE # 6
SEC	LOCATION	
TWP	FIELD	COUNTRY
RGE	PROVINCE	BRITISH COLUMBIA
M	Other Services:	DENS-CAL
	Permanent Datum	GROUND LEVEL
	Log Measured from	GROUND LEVEL
	Well Depth Measured from	
	Elev.	1895
	Ft. Above Perm. Datum	
	K. B.	
	C.S.C.	
	G.L.	1895
Run. No.	ONE	
Date	26 JULY 1975	
First Reading	369	
Last Reading	00	
Footage Logged	369	
Depth Reached	369	
Depth Driller		
Casing Driller		
Fluid Type	WATER	
Liquid Level	15	
Min. Diam.	4-3/4	
Rm. of		
Operating Time	2 HOURS	
Truck No.	30	
Recorded By	SJM	Witnessed By GREEN

GR-RES TOOL SERIAL NO 176



Remarks

CV - Anderson West 83(3)A X(1)

ROKE

SIDEWALL DENSILOG

CALLIPER

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO. COMPANY WEILWOOD OF CANADA LTD

WELL ANDERSON LAKE # 7

LOCATION

FIELD COURTESY

PROVINCE BRITISH COLUMBIA

GROUND LEVEL

Log Measured from GROUND LEVEL

Well Depth Measured from

Perman. Datum

Log Measured from

Well Depth Measured from

GR-RES

K.B.

CSG

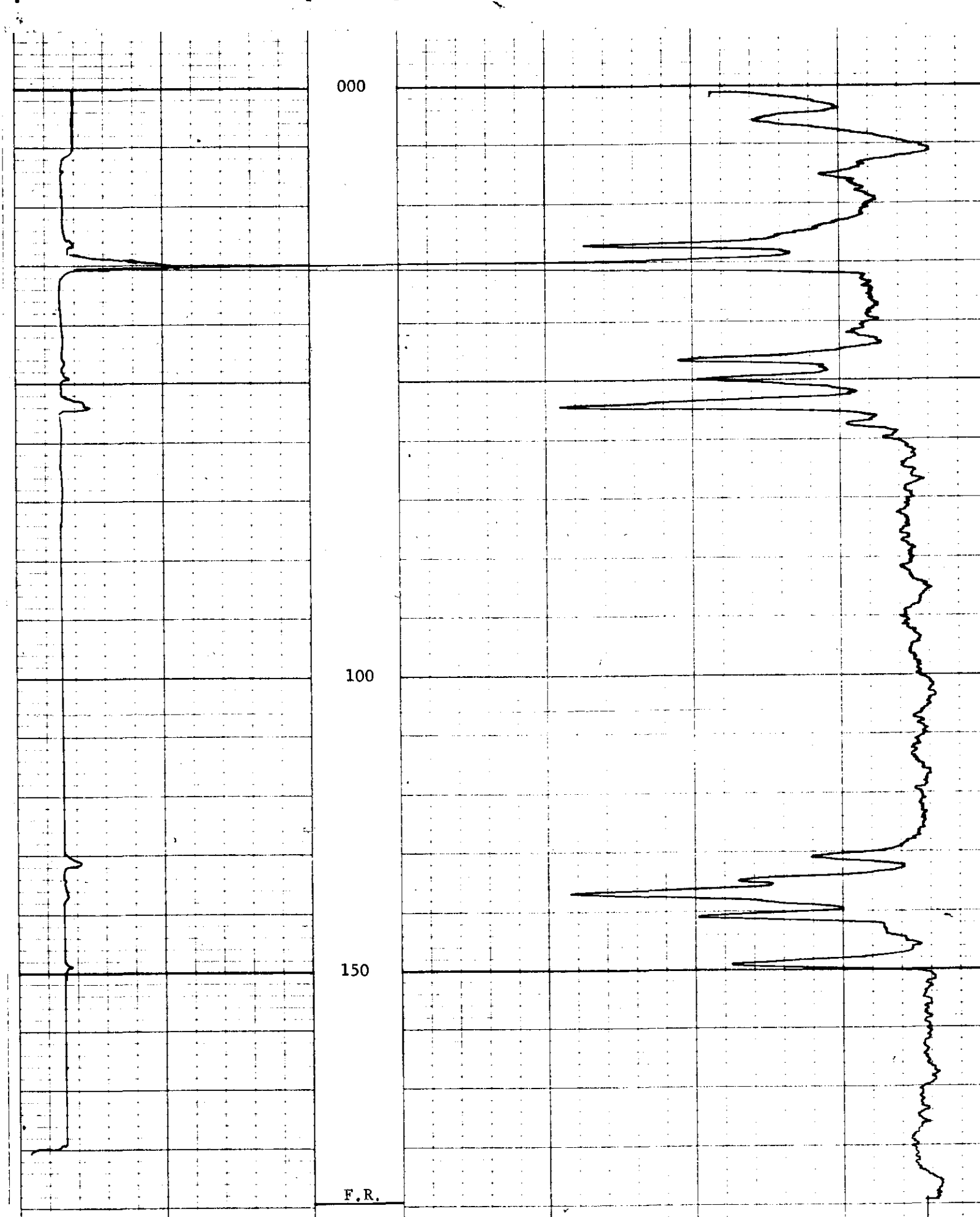
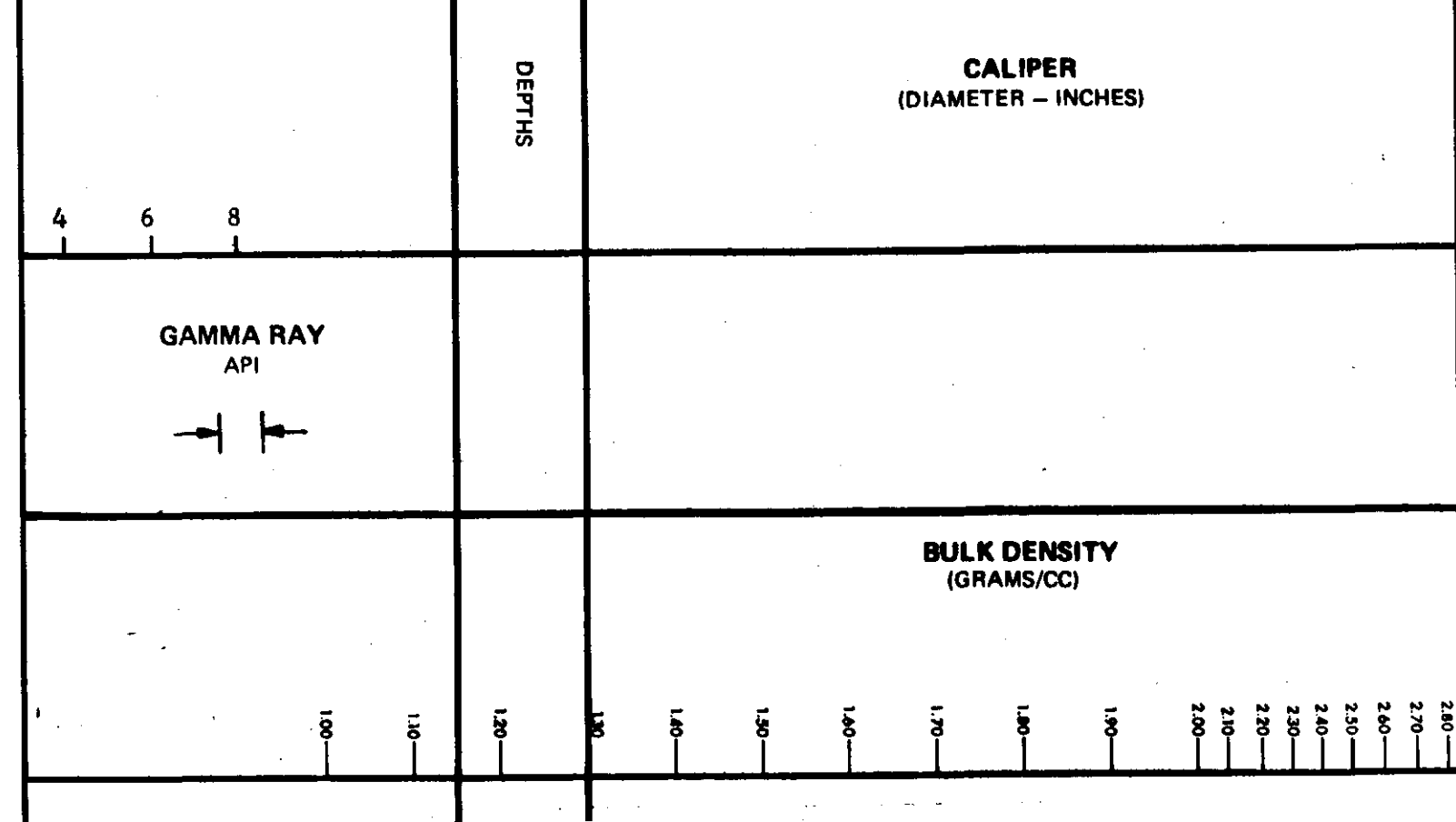
G.I.

39
L2

Run No.	ONE		
Date	26 JULY 1975		
First Reading	189		
Last Reading	00		
Footage Logged	189		
Depth Reached	192		
Depth Driller			
Casing Roke			
Casing Driller			
Fluid Type	WATER		
Liquid Level	56		
Min. Diam.	4-3/4		
Operating Time	1 HOUR		
Truck No.	30		

RUN NO.	GENERAL DEPTHS		SPEED FT/MIN	GAMMA RAY			SIDEWALL DENSILOG				
	FROM	TO		T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G.R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	CPS/DIV
1	00	189	12					3	500	1.12R	31.69
1	00	180	30		CALIPER						

REMARKS
DENSITY TOOL SERIAL NO 241
CALIPER TOOL SERIAL NO 785



SHIFT
500

F.R.

Cx - Anderson West 83(3)A (1*)

ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

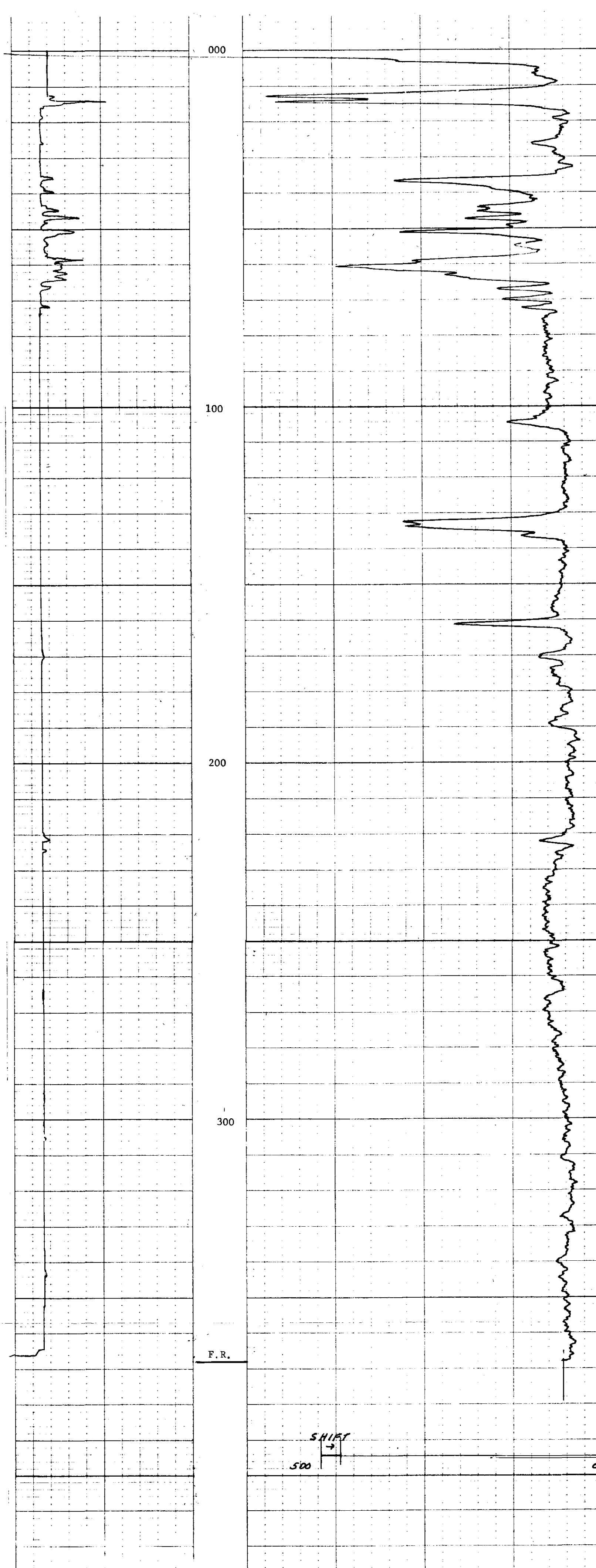
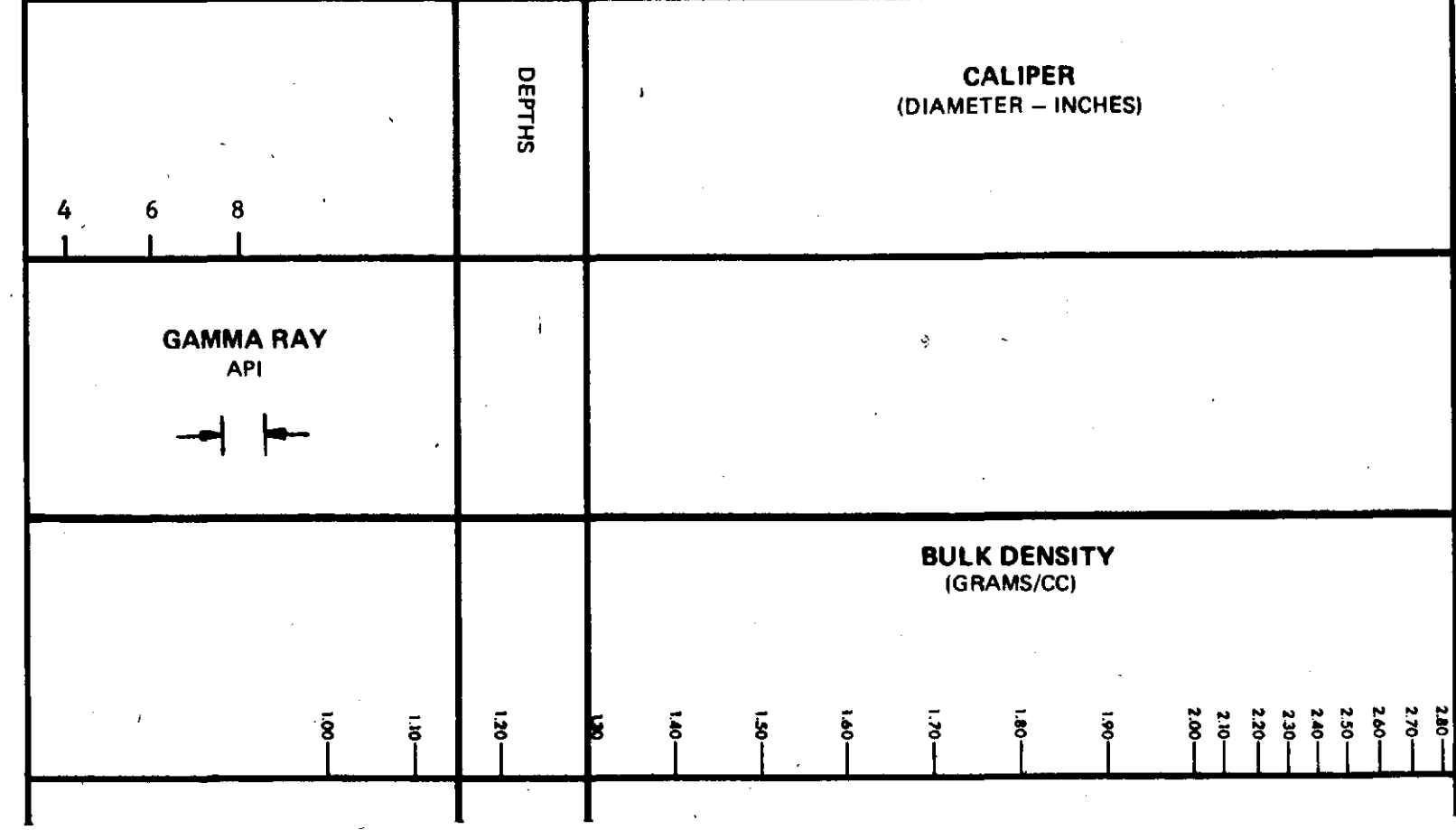
SIDEWALL DENSILOG CALIPER

39
① 73

FILE NO.	COMPANY	WELL	LOCATION	FIELD	PROVINCE	PERMANENT DATUM	GROUND LEVEL	GR-RES
LSD	WEIWOOD OF CANADA LTD	ANDERSON LAKE # 6		COURTNEY	BRITISH COLUMBIA	EMV. 1895		K.B.
SEC								CSG
TWP								G.L. 1895
RGE								
W								
Log Measured from	GROUND LEVEL							
Well Depths Measured from								
Run. No.	ONE							
Date	26 JULY 1975							
First Reading	368							
Last Reading	00							
Footage Logged	368							
Depth Reached	371							
Depth Driller								
Casing Driller								
Fluid Type	WATER							
Liquid Level	15							
Min. Diam.	4-3/4							
Operating Time	2 HOURS							
Truck No.	30							
Recorded By	STM							
Witnessed By	GREEN							

RUN NO.	GENERAL		SPEED FT/MIN	T.C. SEC.	GAMMA RAY		API G.R. UNITS PER LOG DIV.	SIDEWALL DENSILOG		CPS/DIV	
	FROM	TO			ZERO DIV. L OR R	ZERO DIV. L OR R		SENS SETTINGS	ZERO DIV. L OR R		
1	00	368	12					3	500	1.12R	31.69
1	00	366	30		CALIPER						

REMARKS
DENSITY TOOL SERIAL NO 241
CALIPER TOOL SERIAL NO 785



CX - Anderson West 83(3)A x(1)

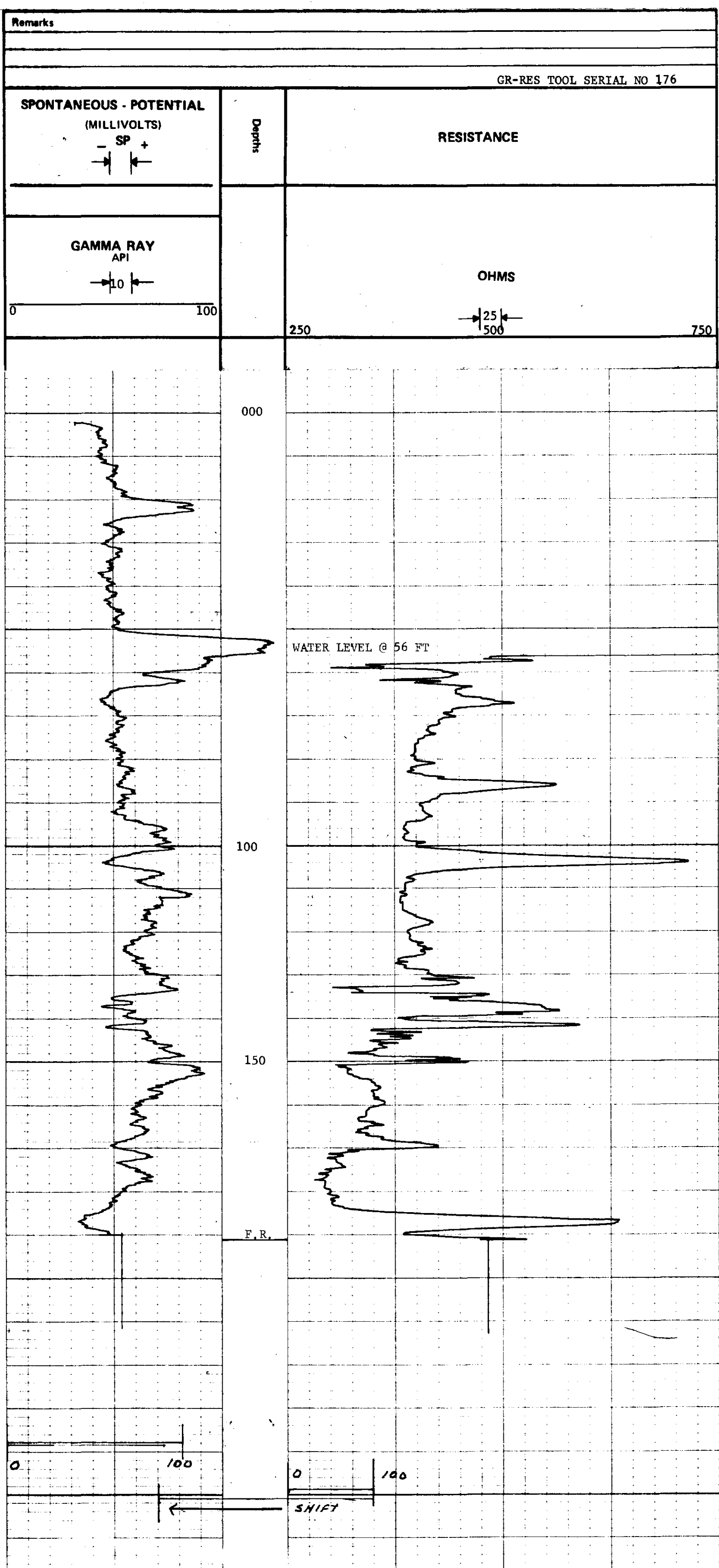
ROKE

OIL ENTERPRISES LTD. CALGARY, ALBERTA

GAMMA RAY RESISTANCE LOG

FILE NO.	COMPANY	WELWOOD OF CANADA LTD
LSD	WELL	ANDERSON LAKE # 7
SEC	LOCATION	
TMP	FIELD	COURTNEY
RGE	PROVINCE	BRITISH COLUMBIA
W	Perm. Datum	GROUND LEVEL
M	Log Measured from	GROUND LEVEL
	Well Depth Measured from	
	Elev.	1495
	Ft. Above Perm. Datum	
	Other Services:	DENS-CAL
		K.B.
		CSG
		G.L.
		1495
Run No.	ONE	
Date	26 JULY 1975	
First Reading	191	
Last Reading	00	
Footage Logged	191	
Depth Reached	191	
Depth Driller		
Casing Roke		
Casing Driller		
Fluid Type	WATER	
Liquid Level	56	
Min. Diam.	4-3/4	
Rm @ of		
Operating Time	1 HOUR	
Truck No.	30	
Recorded By	STM	Witnessed By
		GREEN

GR-RES TOOL SERIAL NO 176



Cx-Anderson West 83(37)A (11)

ROKE

GAMMA RAY - RESISTANCE LOG

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO. _____ COMPANY: WELWOOD OF CANADA LTD.

WELL: BRONNS RIVER # 3

LOCATION: _____

FIELD: COOPERTY

PROVINCE: BRITISH COLUMBIA

Log Measured from: CASING

Well Depth Measured from: _____

Run No. ONE

Date: 24 AUGUST 1975

First Reading: 425

Last Reading: 00

Footage Logged: 425

Depth Reached: 425

Depth Driller: 430

Casing Role: 36

Casing Driller: 36

Fluid Type: WATER

Liquid Level: WATER

Min. Diam: 5

Operating Time: 1-1/2 HOURS

Truck No: 30

Recorded By: SIM

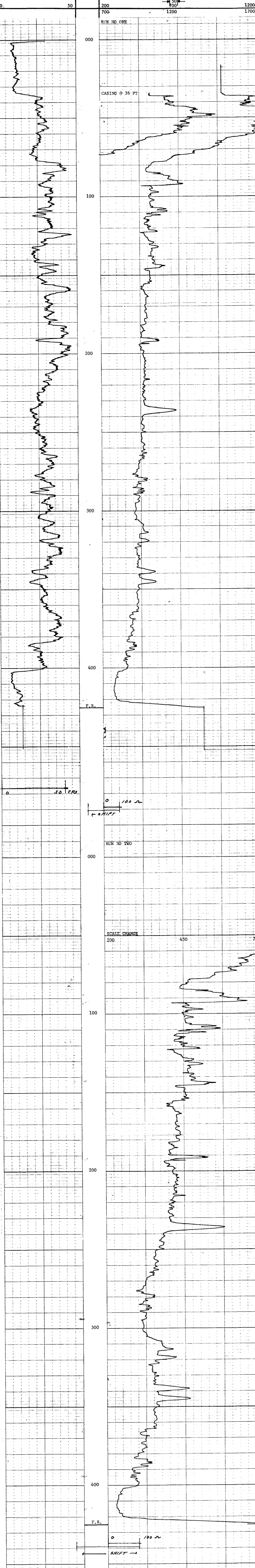
Witnessed By: GREEN

GR-RES TOOL SERIAL NO 176

RESISTANCE OHMS

SPONTANEOUS - POTENTIAL (MILLIVOLTS) SP

GAMMA RAY API



Remarks

Cx-Anderson W-27 83(3)A * (1)

ROKE

SIDEWALL DENSILOG CALIPER

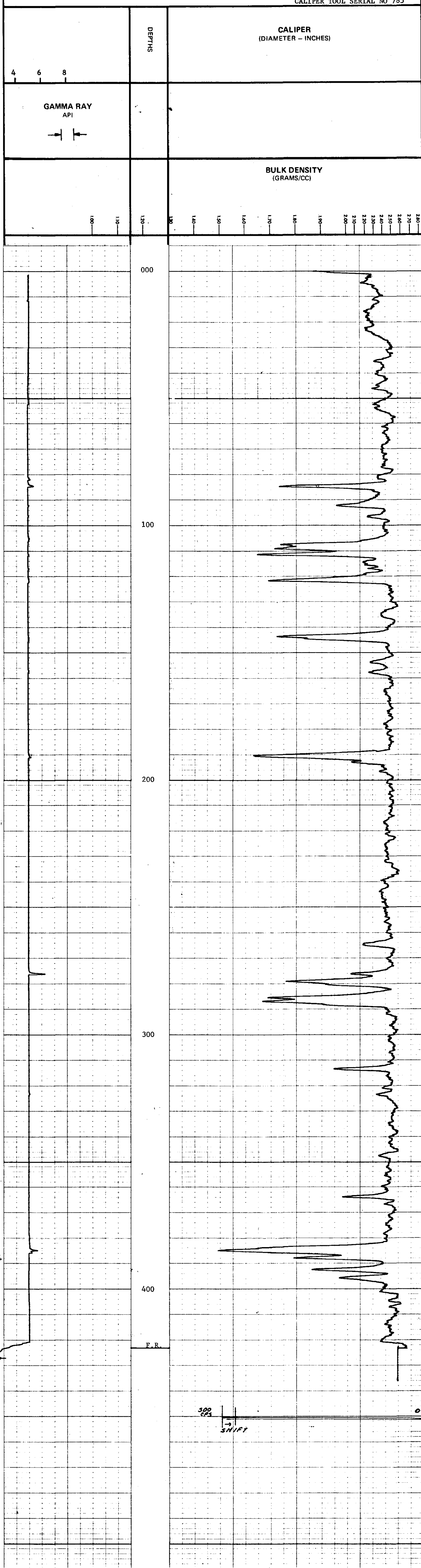
OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.	COMPANY	WELLWOOD OF CANADA LTD.
LSD SEC	WELL	BROWNS RIVER # 3
TWP	RGE	
RGE	LOCATION	
W. M.	FIELD	COURTNEY
	PROVINCE	BRITISH COLUMBIA
	GR-RES	
Permanent Datum	GROUND LEVEL	Elev. _____
Log Measured from	CASING	1 Ft. Above Perm. Datum
Well Depths Measured from		
	K. B.	1
	CSG	1
	G.I.	
Run No.	ONE	
Date	24 AUGUST 1975	
First Reading	423	
Last Reading	00	
Footage Logged	423	
Depth Reached	426	
Depth Driller	430	
Casing Roke	36	
Casing Driller		
Fluid Type	WATER	
Liquid Level		
Min. Diam.	5	
Operating Time	2-1/2 HOURS	
Truck No.	30	
Recorded By	SJM	Witnessed By GREEN

39
L6

RUN NO.	GENERAL DEPTHS		SPEED FT/MIN	T.C. SEC.	GAMMA RAY			SIDEWALL DENSILOG			
	FROM	TO			SENS SETTINGS	ZERO DIV. L OR R	API G.R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	CPS/ DIV
1	00	423	12					3	500	1.12R	31.69
	00	426	30				CALIPER				

REMARKS
DENSITY TOOL SERIAL NO 241
CALIPER TOOL SERIAL NO 785

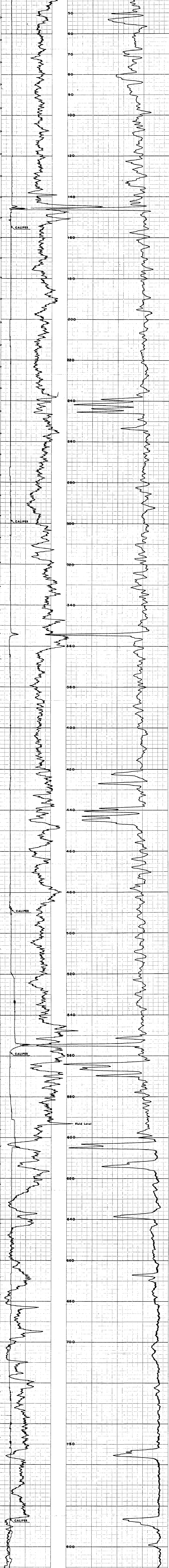
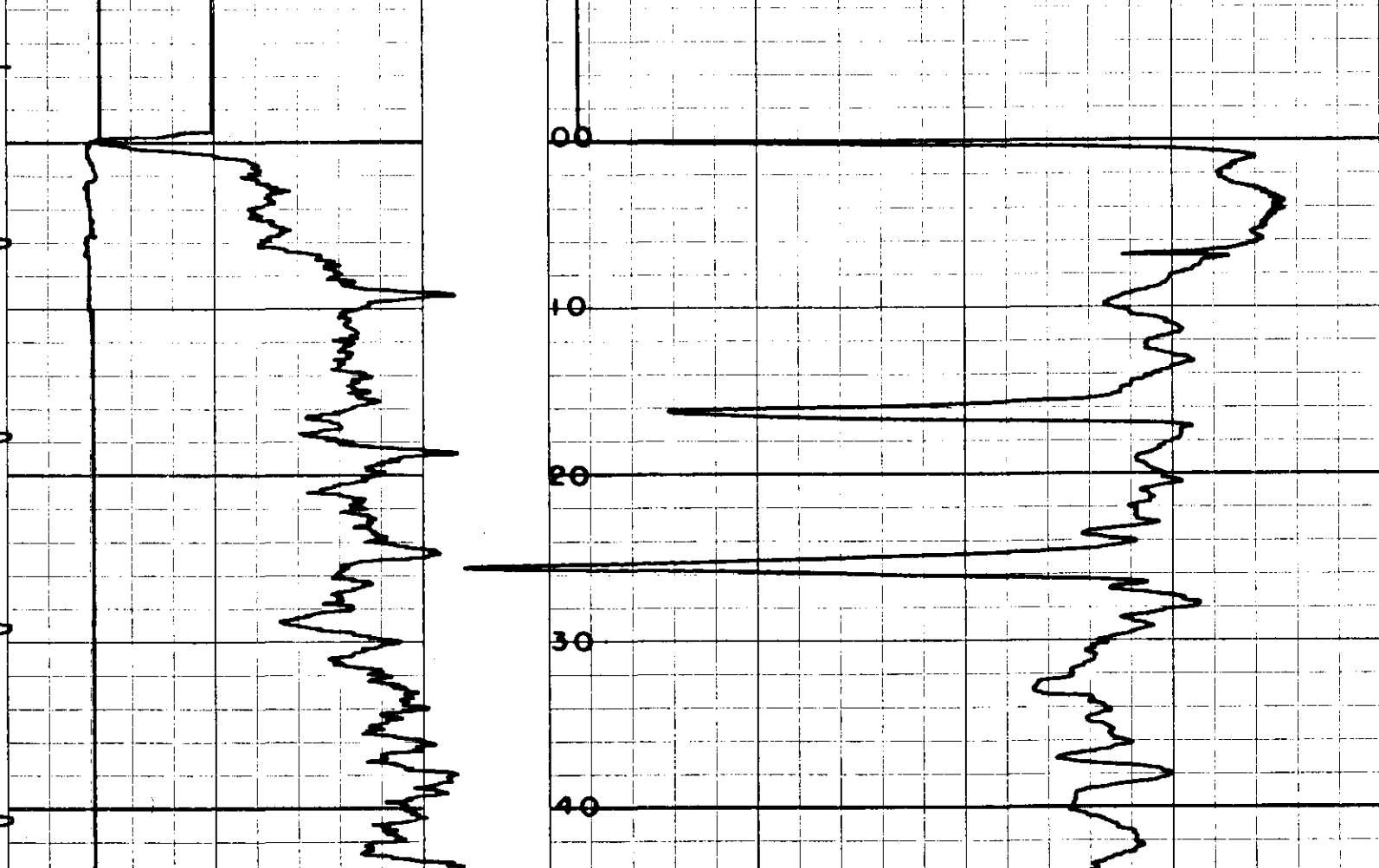


380
375
SHIFT

Ox-Fraction West 83(3)A *10

PROVINCE _____		COMPANY West Wood of Canada Ltd	
WELL _____		WELL BAIDERSIDE LANE #1	
FIELD _____		FIELD CAWKA 818	
LOCATION _____		LOCATION _____	
DATE _____		DATE _____	
LOG NUMBER _____		LOG NUMBER _____	
LOG TYPE _____		LOG TYPE _____	
LOG INTERVAL _____		LOG INTERVAL _____	
LOG SCALES _____		LOG SCALES _____	

DEPTHS Log Interval: 5' to 5' Log Depth: 5' to 5' Log Type: AT Log Scale: 5.74'	SCALES Log Interval: 5' to 5' Log Depth: 5' to 5' Log Type: AT Log Scale: 5.74'
--	--



GAMMA RAY API UNITS	DENSITY ρ_b - g/cc
-------------------------------	-----------------------------------

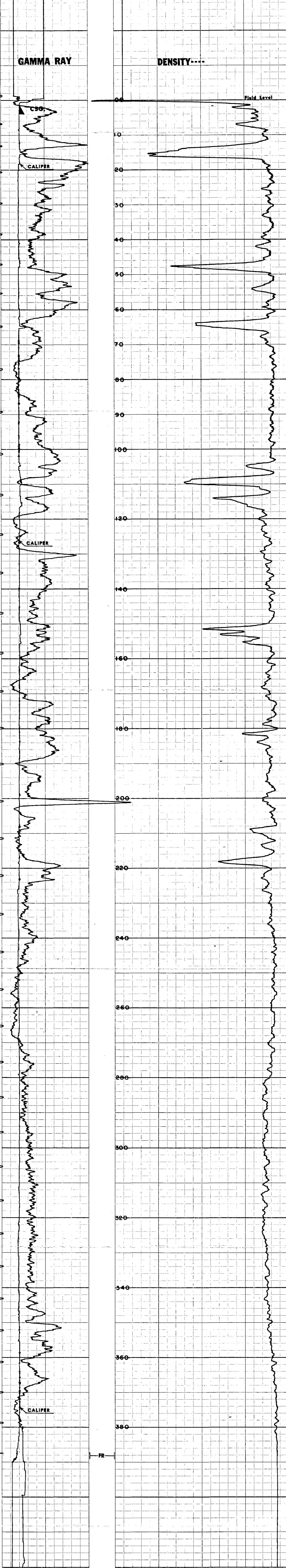
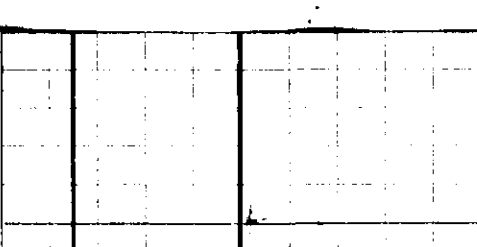
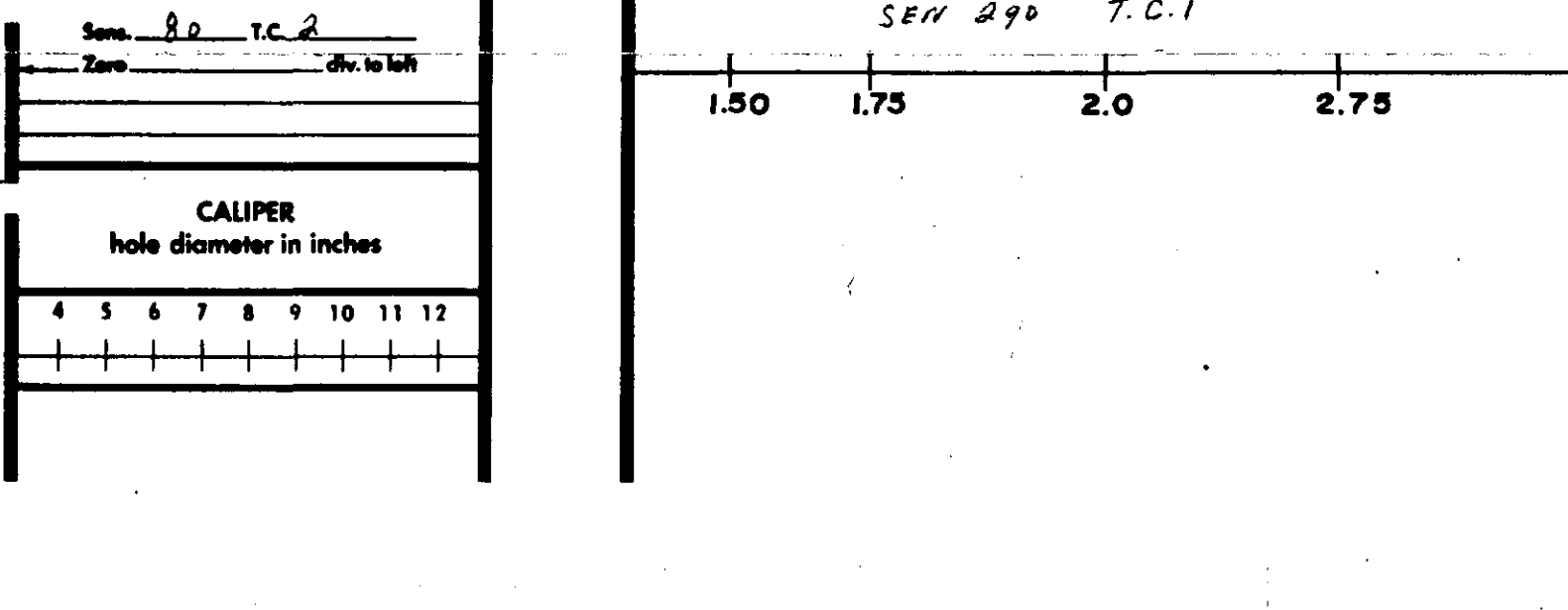
DREXEL CORP. FORMATION DENSITY LOG

Cv Anderson Well 83*(3)A #1

39 / (18)

PROVINCE _____ WELL _____ COMPANY _____	COMPANY <u>WELD WOOD OF CANADA LTD</u>	WELL <u>ANDERSON LANE # 2</u>	FIELD _____
PROVINCE <u>BRITISH COLUMBIA</u> LOCATION _____	Log Interval From <u>G.L.</u> To <u>R. Above Perm. Datum</u> OR <u>CR</u>	Other Services _____	PERMITS: <u>11410</u> <u>11410</u> <u>11410</u>
Date _____ Run No. _____ Log No. <u>ONE 1125</u> Log Reading _____ Feet Recorded _____ Depth Reached _____ Bottom Depth _____	Log No. <u>ONE 1125</u> Log Reading _____ Feet Recorded _____ Depth Reached _____ Bottom Depth _____	Log No. _____ Log Reading _____ Feet Recorded _____ Depth Reached _____ Bottom Depth _____	Log No. _____ Log Reading _____ Feet Recorded _____ Depth Reached _____ Bottom Depth _____

FLUID TO TOP OF HOLE
10' CASING IN HOLE



R

Cx - Anderson West 83(3)A * (1)

ROKE

SIDEWALL DENSILOG

CALIPER

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO. _____ COMPANY WEILWOOD OF CANADA LTD.

WELL ANDERSON LAKE # 4

LOCATION _____

FIELD _____ COUNTRY _____

PROVINCE BRITISH COLUMBIA

Permanent Datum GROUND LEVEL Elev. _____

Log Measured from CASING _____ 2 Ft. Above Perm. Datum

Well Depths Measured from _____

Run No. ONE

Date 23 JULY 1975

First Reading 445

Last Reading 00

Footage Logged 445

Depth Reached 448

Casing Rake 12

Casing Driller _____

Fluid Type WATER

Liquid Level 342

Min. Diam. 4-3/4

39

L/D

Other Services:

GRM

K.B.

CSG

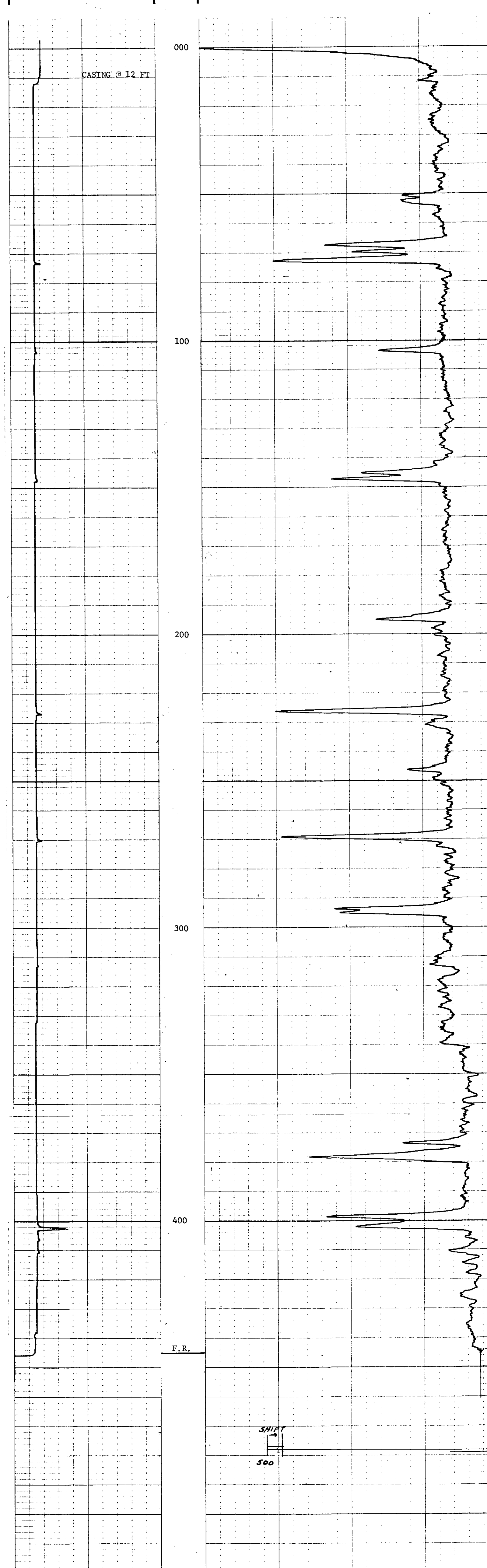
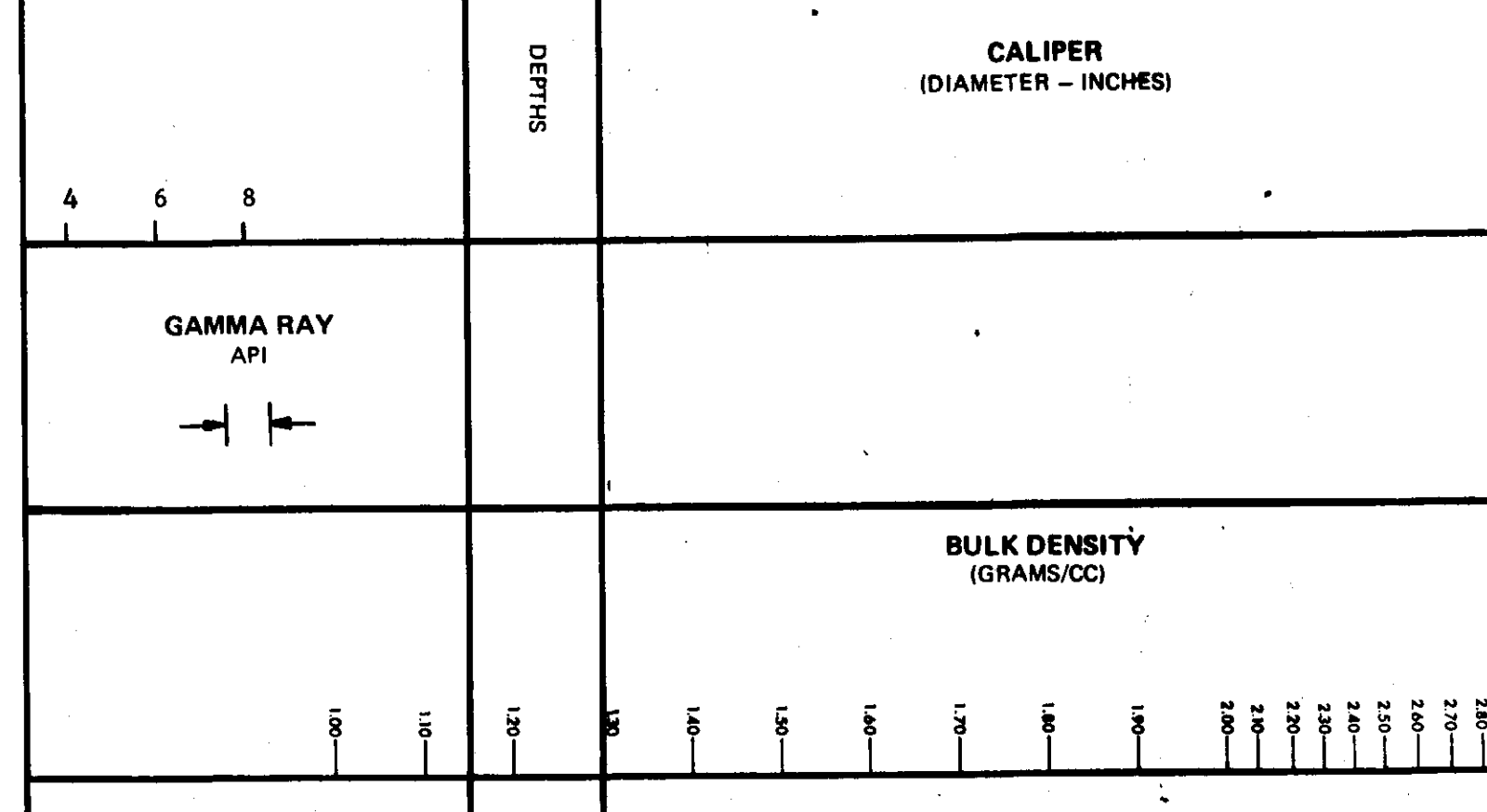
G.L.

Operating Time	2-1/2 HOURS
Truck No.	30
Recorded By	SIM
Witnessed By	GREEN

RUN NO.	GENERAL			GAMMA RAY			SIDEWALL DENSILOG				
	DEPTHS FROM	TO	SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G.R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	CPS/DIV
1	00	445	10					3	500	1.2R	31.69
1	00	446	30			CALIPER					

REMARKS

DENSITY TOOL SERIAL NO 241
CALIPER TOOL SERIAL NO 785



CX-Anderson West 836(A) * (1)

ROKE

GAMMA RAY NEUTRON LOG
OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.	COMPANY	WELLMOOD OF CANADA LTD.
LSD SEC TYPE	WELL	ANDERSON LAKE # 4
RCE	LOCATION	
W	FIELD	COURTENAY
	PROVINCE	BRITISH COLUMBIA
	Log Measured from	CASING
	Well Depths Measured from	2 Ft. Above Perm. Datum
	DENS-CAL	
	K.B. CSG	
	G.L.	
Run No.	ONE	
Date	23 JULY 1975	
First Reading	447	
Last Reading	00	
Footage Logged	447	
Depth Reached	448	
Depth Driller	448	
Casing Rock	12	
Casing Driller		
Fluid Type	WATER	
Liquid Level	342	
Min. Diam.	4-3/4	
Rm @ 9f		
Operating Time	2-1/2 HOURS	
Truck No.	30	
Recorded By	SITK	Witnessed By GREEN

39
(11)

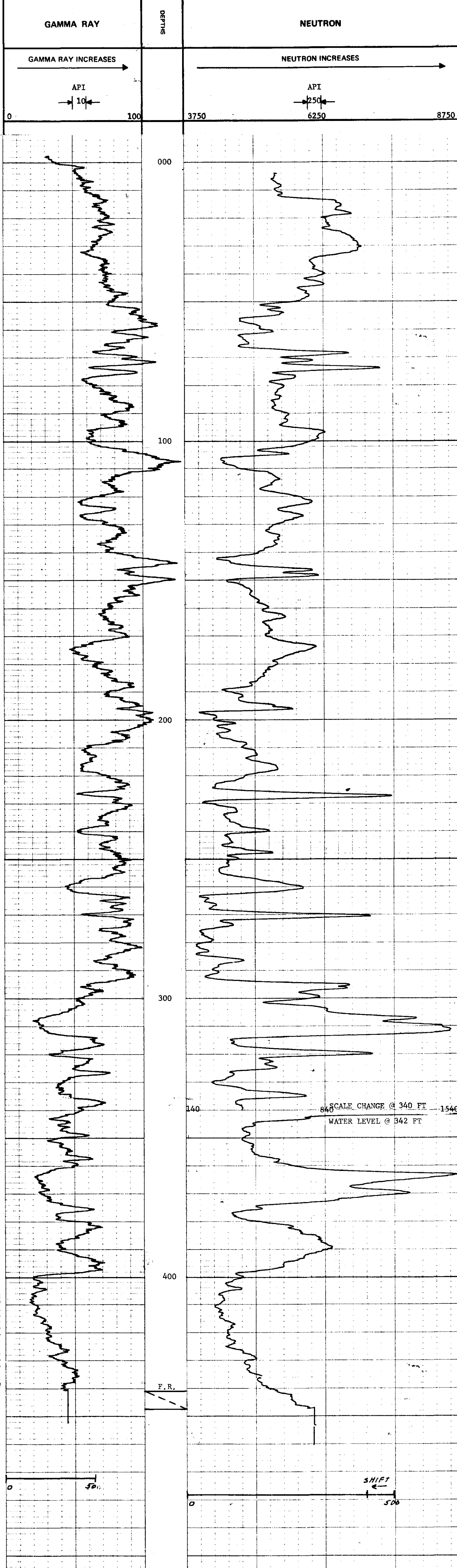
EQUIPMENT DATA

GAMMA RAY		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1-1/4	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1-1/4
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	7.55 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	265
HOIST TRUCK NO.	30	SPACING	
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	RGRN 125-001	STRENGTH	3 CURIES

LOGGING DATA

GENERAL			GAMMA RAY				NEUTRON				
RUN NO.	DEPTHS		SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G. R. UNITS PER LOG DIV.	T. C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API N. UNITS PER LOG DIV.
	FROM	TO									
1	00	340	12	5	50	OL	10 API	3	1000	15L	250 API
	340	447	12	5	50	OL	10 API	3	500	2L	70 API

REMARKS



SCALE CHANGE @ 340 FT
WATER LEVEL @ 342 FT

SHIFT
←
500

Cx-Anderson Well 83(37)A (1)

ROKE

GAMMA RAY NEUTRON LOG
CALIPER
DENSITOG

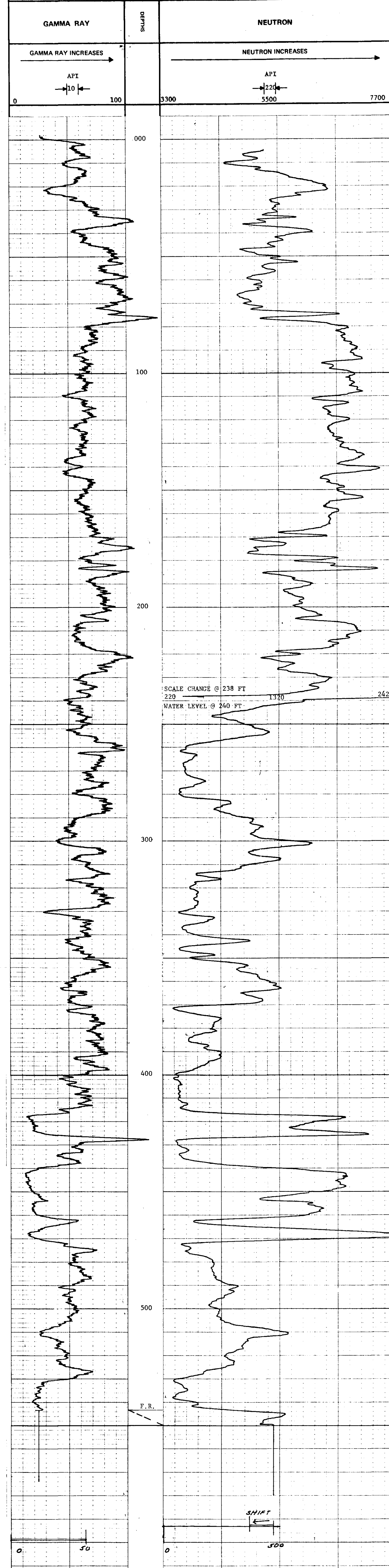
OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO.	COMPANY	WELLMOOD OF CANADA LTD
LSD	WELL	ANDERSON LAKE # 5
SEC	RGE	M
TWP	LOCATION	COURTNEY
RGE	FIELD	COURNEY
W	PROVINCE	BRITISH COLUMBIA
M	Other Services:	DENS-CAL
	Permanent Datum	GROUND LEVEL
	Log Measured from	GROUND LEVEL
	Well Depths Measured from	F. Above Perm. Datum
Run No.	ONE	DATE
Date	23 JULY 1975	First Reading
First Reading	530	Last Reading
Last Reading	00	Footage Logged
Footage Logged	550	Depth Reached
Depth Reached	551	Depth Driller
Depth Driller	12	Casing Driller
Casing Driller		Fluid Type
Fluid Type	WATER	Liquid Level
Liquid Level	240	Mfn. Diam.
Mfn. Diam.	4-3/4	Rm. of
Rm. of		Operating Time
Operating Time	2-1/2 HOURS	Truck No.
Truck No.	30	Recorded By
Recorded By	STM	Witnessed By
Witnessed By	GREEN	

EQUIPMENT DATA		NEUTRON	
RUN NO.	ONE	RUN NO.	ONE
TOOL MODEL NO.		LOG TYPE	NEUTRON/NEUTRON
DIAMETER	1-1/4	TOOL MODEL NO.	
DETECTOR MODEL NO.		DIAMETER	1-1/4
TYPE	SCINTILLATION	DETECTOR MODEL NO.	
LENGTH	4 INCH	TYPE	PROPORTIONAL
DISTANCE TO N. SOURCE	756 FT.	LENGTH	6 INCH
		SOURCE MODEL NO.	MRC-N-SS-W
GENERAL		SERIAL NO.	265
HOIST TRUCK NO.	30	SPACING	
INSTRUMENT TRUCK NO.		TYPE	AmBe
TOOL SERIAL NO.	RGRN 125-001	STRENGTH	3 CURIES

LOGGING DATA		GAMMA RAY		NEUTRON	
RUN NO.	1	T.C.	SENS	T.C.	SENS
DEPTHS	FROM TO	SEC.	SETTINGS	SEC.	SETTINGS
	00 238	5 5	50 50	3 3	1000 500
	238 550	5 5	50 50	3 3	15L 2L

REMARKS



OX-Anderson West 8381A *1)

ROKE

SIDEWALL DENSILOG
CALIPER

OIL ENTERPRISES LTD. CALGARY, ALBERTA

FILE NO. _____
 COMPANY: WELLMOOD OF CANADA LTD.
 WELL: ANDERSON LAKE # 5
 T.M.P. _____
 R.G.E. _____
 W. _____ M. _____
 LOCATION: _____
 FIELD: COUNTRY (Anderson)
 Other Services: (L13)

PROVINCE: BRITISH COLUMBIA
 PERMANENT DATUM: GROUND LEVEL
 Log Measured from: GROUND LEVEL
 Well Depths Measured from: _____
 ELEV. _____ FT. ABOVE PERM. DATUM
 G.S.N. _____
 K.B. _____
 C.S.G. _____
 G.L. _____

Run. No. ONE
 Date: 23 JULY 1975
 First Reading: 548
 Last Reading: 00
 Footage Logged: 548
 Depth Reached: 551
 Depth Driller: 552
 Casing Roke: 12
 Casing Driller: _____
 Fluid Type: WATER
 Liquid Level: 240
 Min. Diam.: 4-3/4
 Operating Time: 2-1/2 HOURS
 Truck No.: 30
 Recorded By: STX
 Witnessed By: GREEN

GENERAL			GAMMA RAY			SIDEWALL DENSILOG					
RUN NO.	DEPTHS		SPEED FT/MIN	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	API G.R. UNITS PER LOG DIV.	T.C. SEC.	SENS SETTINGS	ZERO DIV. L OR R	CPS/DIV
	FROM	TO									
1	00	548	10					3	500	1.2R	31.69
1	00	550	30		CALIPER						

REMARKS: DENSITY TOOL-SERIAL NO 241
 CALIPER TOOL SERIAL NO 785

