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AND ASSOCIATES LTD.  
CONSULTING GEOLOGICAL ENGINEERS

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VANCOUVER 1, B.C.

Report On  
1973 Diamond Drilling Program  
Carmacks Coal

Teslin Exploration Ltd.

Yukon Territorial Coal Licenses

15 NE Quarter - NTS 115I/1  
16 East Half of NW Quarter - NTS 115I/1  
17 SE Quarter - NTS 115I/1

M.P. Phillips  
November, 1973

This report has been examined; declared acceptable as Representation Work under Section 32 and Schedule B of the Canada Mining Regulations and valued in the amount of \$19,505.64

Chief,

Date: Dec 7, 1973.

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Table 1 - Results of Coal Analysis - Birtley Engineering(Canada )  
Ltd., Calgary, Alberta

Diamond Drill Hole Logs 73-1, 73-2, 73-3

### Illustrations

Figure 1 - Plan Showing Location , Scale 1:1,000,000 - following page 1

Figure 2 - Plan Showing Location of Drill Holes , Scale 1:50,000 - in pocket

Figure 3 - Cross Section DDH 73-1 - in pocket

Figure 4 - Cross Section DDH 73-2 & 3 - in pocket

### SUMMARY AND RECOMMENDATIONS

During the period October 21 to 25, 1973, Teslin Explorations Ltd. constructed one mile of access road and drilled three core holes totalling 517 feet on Coal Licenses 15 and 17 in the Carmacks area, Yukon.

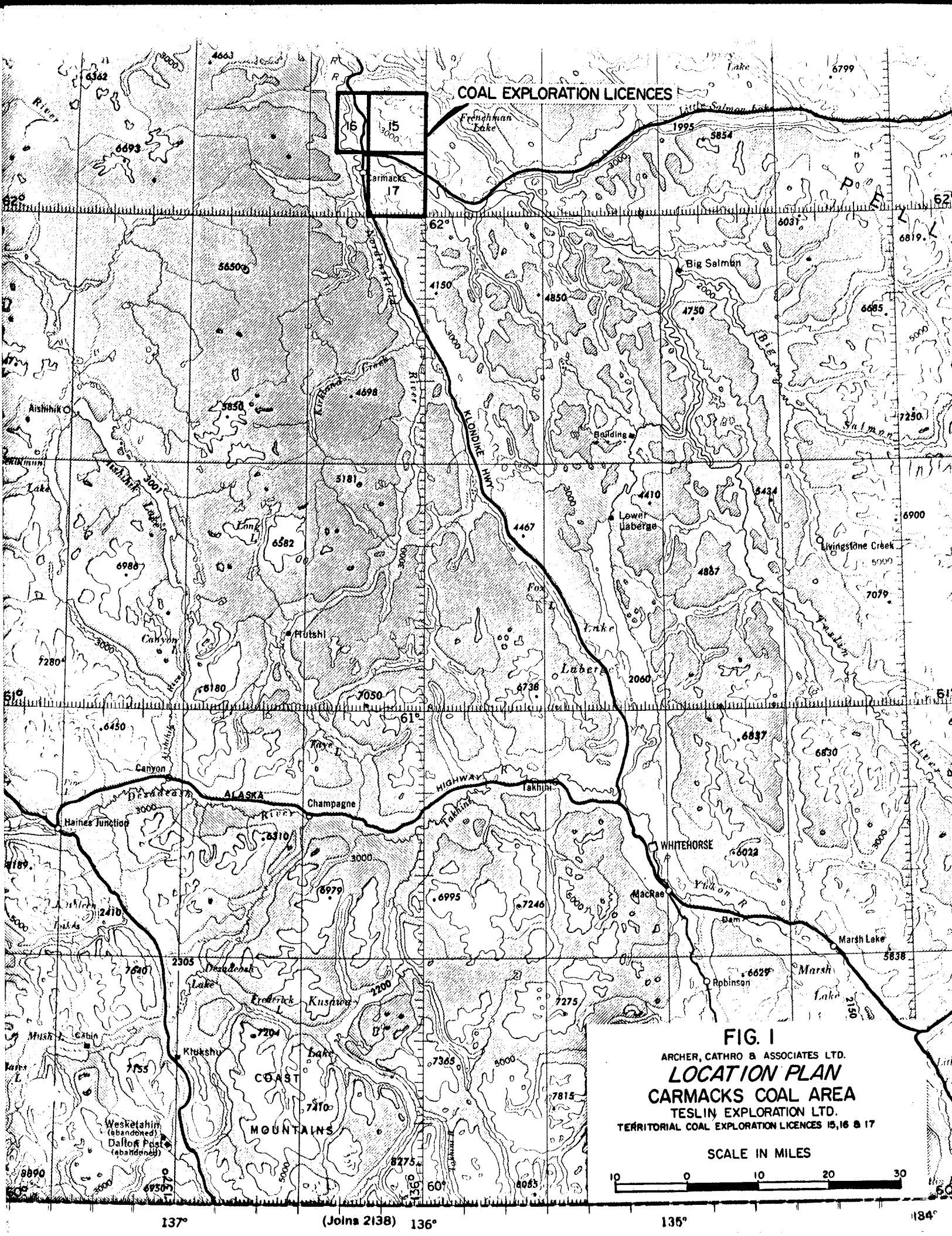
License 15 - Two holes (262 and 15 ft.) cut west dipping beds of the Tantalus Formation that contain partings and narrow bands of coal.

License 17 - Two core holes on License 17, one in 1971 and one in 1973, confirmed the presence of a ten foot thick seam (Teslin Seam) of coking-quality coal in the Laberge Series sediments, about 115 feet below the base of the Tantalus Formation.

If the economics of coal in the Carmacks area appear favourable, a geological trenching and diamond drilling program should be conducted to prove the continuity and quality of the coking coal seam. In preparation for this, two coal mining leases should be staked north of Leases 2955 and 2956 in Licenses 15 and 16, and four leases should be staked south and east of Leases 2949 and 2954 in License 17, or shown on Figure 2 in the pocket.

### INTRODUCTION

The 1973 program was primarily aimed at resampling the coal seam intersected with poor recovery in 1971 Hole 71-2 on License 17. This seam was analyzed by the Fuel Research Centre, Mines Branch, Ottawa, which described it as a high-ash coking coal which might be suitable for the Japanese market if it could be suitably cleaned. Drilling on License 15 in 1973 was of an exploratory and geological nature. The program was supervised



COAL EXPLORATION LICENCES

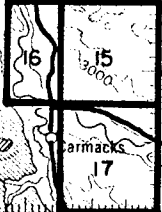
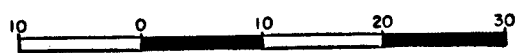


FIG. 1  
 ARCHER, CATRO & ASSOCIATES LTD.  
**LOCATION PLAN**  
**CARMACKS COAL AREA**  
 TESLIN EXPLORATION LTD.  
 TERRITORIAL COAL EXPLORATION LICENCES 15, 16 & 17

SCALE IN MILES



by M.P. Phillips of Archer, Cathro & Associates Ltd., Whitehorse.

PROPERTY

Teslin Exploration Ltd. holds three Territorial Coal Licenses within NTS map sheet 115I/1 in the Carmacks area, central Yukon. They were issued on September 2, 1970 and form a contiguous block comprising about 175 square miles, within which are several old coal leases owned by Anvil Mining Corp. Ltd. The Teslin Licenses are 15 (northeast quarter), 16 (east half of northwest quarter) and 17 (southeast quarter).

LOCATION AND ACCESS

Carmacks lies 100 miles north of Whitehorse, the terminus of the 120 mile narrow-gauge White Pass and Yukon Route railway from the port of Skagway, Alaska. The extension of the railhead to Carmacks has been discussed at recent meetings between White Pass and the Yukon Territorial Government and it is rumoured that this extension may take place within the next five years.

The Klondike Highway, an all weather gravel road from Whitehorse to Dawson, parallels the western boundary of License 17 through Carmacks and crosses License 16. The first twenty miles of this road has been paved in the past two years and pavement is scheduled to reach Carmacks by 1978. The all weather gravel Campbell Highway starts at Carmacks and passes through the northern part of License 17. A 5000 foot gravel airstrip is situated three miles east of Carmacks on the Campbell Highway. The

Whitehorse-Faro power line, which supplies Anvil Mining Corporation crosses License 17.

Access for the drilling on License 15 is provided by a good one mile bush road which leaves the Klondike Highway at M.P. 107.7 , about four miles north of Carmacks. License 16 is crossed by the Klondike Highway and access to the Five Fingers Mines area is provided by a 3.5 mile road constructed by Teslin in 1971. In 1966, Anvil Mining Corporation constructed an access road from M.P. 100.5 on the Klondike Highway to coal leases south of Carmacks. Teslin extended this road 4000 feet during 1971. This road is only passable by four wheel drive vehicles during freeze-up.

#### TOPOGRAPHY

These licenses lie within the Yukon Plateau . Relief is moderate, consisting of rolling hills and broad flat valleys. Elevations vary from 1700 to 3000 feet. Glacial till covers large areas. Deep ravines and creeks have in places cut through the glacial till and exposed bedrock. Permafrost conditions exist below spruce and pine covered, north-facing slopes . South facing slopes are usually covered by grass and aspen groves.

#### HISTORY

Dr. G.M. Dawson of the Geological Survey of Canada made the first report of coal occurrences in the Five Fingers and Carmacks area in 1887.

Coal was produced from the Five Fingers and Tantalus Mines around the turn of the century for use on riverboats. The longest coal mining operation has been at the Tantalus Butte Mine which has produced from 1923 to 1967 and from 1969 to the present. Coal was supplied during this period to Carmacks, Dawson and United Keno Hill Mines at Elsa. In 1969 the mine was re-opened to supply coal to Anvil Mine where it is used for plant heating and concentrate drying.

In December, 1965, Anvil staked coal mining leases around the Tantalus and Tantalus Butte Mines and acquired leased ground near the Five Fingers Mine. From 1966 to 1968, Anvil constructed access roads and carried out a trenching and drilling program, and topographic surveys on the leases south of Carmacks.

In 1971, Teslin constructed a 3.5 mile road to a point 4000 feet south of the Five Fingers Mine where a 188 foot core hole was drilled on License 16. On License 17, a 3/4 mile extension to the Anvil access road permitted the drilling of a 310 foot core hole. Details of this work is covered in a report by J.F. Hlavay, P.Eng. 1971.

In 1972 a reconnaissance photogeological map covering the three license areas was prepared by Teslin Explorations Ltd.

### GEOLOGY

#### Regional

Coal occurrences in the Carmacks area occur in clastic units within the Jurassic-Lower Cretaceous Laberge Series and Tantalus Formation. The Laberge Series comprises alternating sandstone and shale with narrow conglomerate beds and is overlain disconformably by Tantalus Formation conglomerates with subordinate sandstone and shale. The beds have been folded into tight, northwest trending synclines and anticlines. Both units are intruded and overlain by volcanic rocks of the Mt. Nansen and Carmacks Series. Glacial and alluvial cover is extensive, resulting in poor exposure of coal bearing rock. This factor has inhibited coal exploration and development.

#### Coal Licenses

- (1) License 17: The closest bedrock exposures are one mile northwest

of the Teslin holes on leases owned by Anvil Mining Corporation. A steeply east dipping, north to northwest trending, 30 foot thick coal seam has been exposed by trenching in Tantalus Formation. This seam may be a southern extension of the Tantalus Mine seam. Reflectance tests by Dr. P.A. Hacquebard of the Coal Section, Geological Survey of Canada, have shown that the Tantalus Mines seam and the Tantalus Butte seam are the same.

Hole 71-2, drilled to the east at a dip of 60° was sited on the basis of airphoto interpretation to cut beds on the east limb of a tightly folded syncline. Hole 73-1 was drilled beside Hole 71-2 (same dip and direction) and intersected the base of the Tantalus Formation and upper beds of the Laberge Series. Four coal seams less than 1.0 feet thick and a 10.4 foot coal seam (Teslin Seam) interbedded with mudstone was cut in this hole.

The following stratigraphic units were recognized:

Laberge Series

- Sandstone - Dark grey in color, generally very fine grained, rare subordinate medium grained; massive to finely bedded with occasional black mudstone partings.
- Siltstone - Black to dark grey; massive; rarely finely interbedded with black mudstone and fine grained sandstone.
- Mudstone - Black; massive; sometimes slightly silty with carbonaceous shale and bright shiny coal partings and narrow lenses.
- Coal - The upper part of the coal seams are interbedded partings and lenses of carbonaceous shale, mudstone and coal, gradually changing to a bright shiny coal.

The Teslin seam is 10.4 feet thick and consists<sup>5</sup> of a lower 4.1 foot coal band overlain by black mudstone with numerous partings, narrow lenses and bands of coal.

Tantalus Formation

Conglomerate - Well packed; subangular to subrounded pebbles of black chert, white quartz and greenish quartzite up to one inch in diameter in a grit matrix of the same composition.

License 15

The closest bedrock exposure is Tantalus Formation grit which outcrops about 2000 feet south of Hole 73-2. Bedding strikes north and dips steeply east. Hole 73-1 was drilled to the west to cut the bedding but intersected beds dipping parallel to the drill hole. Hole 73-3 was drilled to determine the bedding attitude. The holes cut conglomerate, grit, sandstone, siltstone and mudstone of the Tantalus Formation and intrusive andesite. Coal partings and lenses up to 0.3 feet wide are present in all the sediments.

CORE LOGGING AND SAMPLING

All core was transported to Whitehorse by truck where it was logged, sampled and stored at the Core Library of the Yukon Resident Geologist, Dept. of Indian Affairs and Northern Development. Logs for the holes are included in the Appendix of this report. Whole core sampling was carried out only on the Teslin Seam in Hole 73-1 and samples were sent to Birtley Engineering (Canada) Ltd. of Calgary, Alberta for analysis. Details of the sampling is as follows:

<u>Sample No.</u>	<u>From</u>	<u>To</u>	<u>Length(ft)</u>	<u>Recovery(ft)</u>	<u>Description</u>
A369	166.1	171.9	5.8	5.3	coal, mudstone
	171.9	172.4	0.5	not sampled	siltstone
370	172.4	176.5	4.1	2.8	coal

COAL ANALYSIS

Results of Birtley Engineering's analysis are shown in Table 1 at the end of this report and are discussed in a separate report by Birtley.

### DIAMOND DRILLING

Drill contractor was E. Caron Diamond Drilling of Whitehorse, which supplied a Longyear 38 wireline drill machine and ancillary equipment to drill HQ (2.5 inch diameter) core holes. A D6 bulldozer was used to move the drill. Coring charges were \$9.75 per foot. Other work was charged at field cost. The drill crew were lodged at the Carmacks Hotel. The only serious delay was in Hole 73-2 when caving behind the core barrel at the bottom of the hole resulted in the drill rods separating from the core barrel. Water was supplied to the drill from lakes near the drillsites. A drilling mud solution and various additives was used as a circulation medium. Core recovery varied from 98 to 100 per cent and was slightly lower in the soft coal and mudstone bands. The use of drilling mud, large core diameter, five foot core barrel and experienced drillers were responsible for the excellent core recovery. An acid test at the bottom of Hole 73-1 showed that the hole dip remained constant. No delays were encountered by mechanical breakdowns to the drill machine. Total drilling cost including mobilization and demobilization of equipment and lodging for the drillers was \$24.60 per foot to drill 517 feet.

### ROAD CONSTRUCTION

In September 1973, A. Wheeler of Carmacks constructed a one mile road from mile 107.7 on the Klondike Highway, using a D8 bulldozer with blade and ripper, to provide access to License 15.

Cleared brush and trees were buried with dirt as requested by the Yukon Forest Service.

GEOPHYSICAL TESTS

Induced Polarization (I.P.) Survey

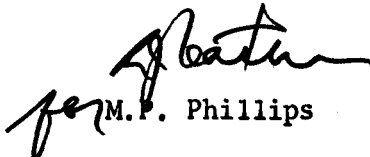
On September 5, 1973, T.R.B. Dundas of Kenting Earth Sciences Limited, Calgary, accompanied by the writer, carried out a test I.P. survey across the coal seams at the Tantalus Butte and Tantalus Mines. Results of the survey indicate that the coal seams do not give a detectable I.P. response. Detail of the survey are given in a report by T.R.B. Dundas dated September, 1973.

Electromagnetic (EM 16) Survey

On October 27, the writer assisted Steve Presunka in conducting a test EM 16 survey across two recently trenched coal seams located approximately one mile north of the Tantalus Butte Mine and another test line across the Tantalus Mine Seam. EM 16 measures the secondary fields set up when signals from VLF submarine communications stations meet conductive bodies. Results of these tests indicate that the Carmacks coal seams have a higher conductivity than the surrounding rocks and give detectable anomalies. Conductivity tests carried out in Whitehorse on individual lumps of coal showed that the coal was not conductive. Residual moisture must have been lost when the lump of coal was exposed to room temperature.

Respectfully submitted,

ARCHER, CATHRO & ASSOCIATES LTD.

  
for M.P. Phillips

A REPORT TO TESLIN EXPLORATION LTD.  
ON THE ANALYSES OF COAL FROM THE  
CARMACKS AREA, YUKON TERRITORY

Prepared By

*D. F. Symonds*

Dr. D. F. Symonds, P. Eng.

Coal Science and Minerals Testing Division

November 21st, 1973



# BIRTLEY ENGINEERING (CANADA) LTD.

Subsidiary of Great West Steel Industries Ltd.

5112-3rd ST. S.E., CALGARY, ALBERTA T2H 1J6 PHONE 403-253-3719

A REPORT TO TESLIN EXPLORATION LTD. ON THE ANALYSES OF COAL FROM THE  
CARMACKS AREA, YUKON TERRITORY November 21, 1973

## 1. INTRODUCTION

Two coal samples, labelled A-00369 and A-00370 of approximately 10 lbs. each were received in polyethylene bags from the Carmacks Area. They were air dried and then analysed as shown in Figure 1. It should be noted that a composite sample of the floats at 1.50 S.G. (+28 mesh) and the froth concentrates (-28 mesh) was sent to the Fuels Research Centre, Department Energy, Mines and Resources, Ottawa for petrographic analysis.

The results of the laboratory analysis are shown on Tables 1 and 2.

## 2. DISCUSSION OF RESULTS

The raw ash contents of the samples were high, particularly for sample A-00369 (69.6 air dried basis). It was noticeable, however, that both samples possessed agglomerating properties, even at the high ash contents (an F.S.I. of 7 at an ash content of 30.4% is unusual).

Sink-float and froth flotation tests were carried out on the samples to determine if the elevated ash contents were due to pure rock mixed with the coal or high inherent ash qualities. The tests showed that the samples were composed of both high inherent ash contents and large proportions of reject material.

The coal samples exhibited excellent swelling properties (F.S.I. values of 8 and  $8\frac{1}{2}$  were encountered on the clean coal fractions) Even the tailings from sample 370 had an F.S.I. of  $6\frac{1}{2}$  at an ash content of 37.0.

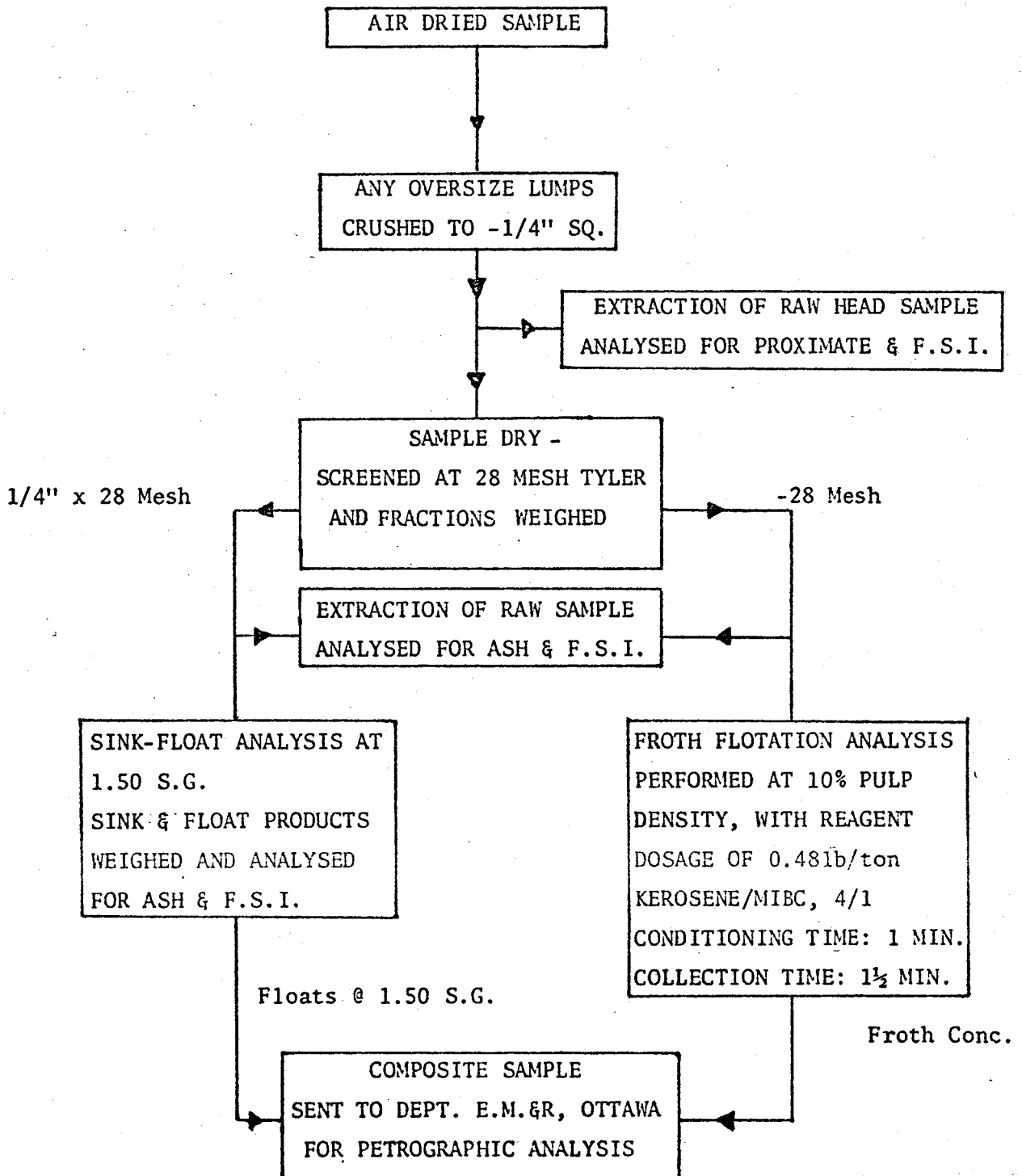
We estimate the rank of the coal as ASTM High Volatile A.

## 3. SUMMARY

After this very preliminary examination, the indications are that the samples possess good swelling characteristics, but also have high inherent ash contents.

FLWSHEET FOR THE ANALYSIS OF  
THE CARMACKS COAL SAMPLES

Figure 1



TESLIN EXPLORATION

A-00370

Table 1

RAW ANALYSIS

November 2nd, 1973

<u>Ash %</u>	<u>RM %</u>	<u>VM %</u>	<u>FC %</u>	<u>F.S.I.</u>
30.4	1.0	26.8	41.8	7

SIZE ANALYSIS

<u>Size Fraction</u>	<u>Wt %</u>	<u>Ash %</u>	<u>Cum Wt %</u>	<u>Cum Ash %</u>	<u>F.S.I.</u>
1/4" x 28M	76.5	33.2	76.5	33.2	6½
28M x 0	23.5	21.2	100.0	30.4	7½

SINK-FLOAT ANALYSIS: 1/4" x 28M

<u>S. G. Fraction</u>	<u>Wt %</u>	<u>Ash %</u>	<u>Cum Wt %</u>	<u>Cum Ash %</u>	<u>F.S.I.</u>
-1.50	42.3	13.7	42.3	13.7	8
+1.50	57.7	46.3	100.0	32.5	1

FROTH FLOTATION: 28M x 0

Reagent Dosage = 0.48 lb/ton, Kerosene:MIBC 4:1

<u>F. F. Fraction</u>	<u>Wt %</u>	<u>Ash %</u>	<u>Cum Wt %</u>	<u>Cum Ash %</u>	<u>F.S.I.</u>
Conc.	65.1	13.1	65.1	13.1	8½
Tails	34.9	37.0	100.0	21.4	6½

\* Conc. is froth collected in 1 1/2 minutes after 1 minute conditioning.

TESLIN EXPLORATION

A-00369

Table 2

RAW ANALYSIS

November 2nd, 1973

<u>Ash %</u>	<u>RM %</u>	<u>VM %</u>	<u>FC %</u>	<u>F.S.I.</u>
69.6	1.5	14.0	14.9	1

SIZE ANALYSIS

<u>Size Fraction</u>	<u>Wt %</u>	<u>Ash %</u>	<u>Cum Wt %</u>	<u>Cum Ash %</u>	<u>F.S.I.</u>
1/4" x 28M	89.0	73.8	89.0	73.8	½
28M x 0	11.0	37.6	100.0	69.8	6½

SINK-FLOAT ANALYSIS: 1/4" x 28M

<u>S. G. Fraction</u>	<u>Wt %</u>	<u>Ash %</u>	<u>Cum Wt %</u>	<u>Cum Ash %</u>	<u>F.S.I.</u>
-1.50	6.5	14.3	6.5	14.3	8
+1.50	93.5	77.1	100.0	73.0	N.A.

FROTH FLOTATION: 28M x 0

Reagent Dosage = 0.48 lb/ton, Kerosene:MIBC 4:1

<u>F. F. Fraction</u>	<u>Wt %</u>	<u>Ash %</u>	<u>Cum Wt %</u>	<u>Cum Ash %</u>	<u>F.S.I.</u>
Conc.	49.7	18.0	49.7	18.0	8
Tails	50.3	58.8	100.0	38.5	1

\* Conc. is froth collected in 1 1/2 minutes after 1 minute conditioning.

REPORT ON  
AN INDUCED POLARIZATION TEST SURVEY  
OVER COAL  
IN THE  
YUKON TERRITORY  
FOR  
ARJAY KIRKER RESOURCES LTD.  
BY  
T.R.B. Dundas, M.Sc.

REPORT ON  
AN INDUCED POLARIZATION TEST SURVEY  
OVER COAL

IN THE  
YUKON TERRITORY

FOR

ARJAY KIRKER RESOURCES LTD.

BY

KENTING EXPLORATION SERVICES LIMITED

CALGARY, ALBERTA

SEPT. 1973

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<u>ACCOMPANYING MAPS</u>	<u>LOCATED</u>
Fig. 1 - Location Map	In Report
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Fig. 3 - Apparent Resistivity Contour Map	In Pocket



116

106

YUKON

TERRITORY

115

105

SURVEY AREAS

LOCATION MAP  
Scale: 1: 3000 00

## INTRODUCTION

### General

This report describes the results of an Induced Polarization (I.P.) Test Survey carried out by Kenting Exploration Services Limited, over Coal Seams in the Yukon Territory for Arjay Kirker Resources Ltd.

The field work was carried out on September 4th and 5th, 1973 by T.R.B. Dundas, Senior Geophysicist in two different areas.

The first area was in the Nordenskiold Coal Area, Territorial Licence No. 10 where Line 0 was surveyed.

The selected sites in the second area at Carmacks were inaccessible and test work was carried out over Coal Seams at the Anvil Coal Mine and at a coal exposure on the Bank of the Yukon River in Carmacks.

## SURVEY SPECIFICATIONS

### A. Induced Polarization Survey

#### Instrumentation

The equipment used for the Induced Polarization survey consisted of a Hunttec Mark III pulse-type system.

The Hunttec Mark III Receiver presents digitally the primary voltage,  $V_p$ , and four (4) individual values ( $M_1$ ,  $M_2$ ,  $M_3$  and  $M_4$ ) of the decay curve in a single reading. Additional points on the decay curve may be obtained by changing the instrument parameters. The decay curve may be used to distinguish electromagnetic effects from the true Induced Polarization voltage.

The following specifications apply:-

Current - D.C.	- 2.0 seconds "current on" 2.0 seconds "current off" Alternate pulses have reversed polarity
Transmitter Power Available	- 10.0 k Watt
Integrating Time	- 30 milliseconds
Delay Time from "current off" to start of integration	- 30 milliseconds
Time from "current off" to centre of each integrated chargeability:-	
$M_1$	- 45 milliseconds
$M_2$	- 90 milliseconds
$M_3$	- 180 milliseconds
$M_4$	- 360 milliseconds

Chargeability ( $M_1$ ,  $M_2$ ,  $M_3$ ,  $M_4$ ) - Expressed as percentage of primary voltage,  $V_p$ .

### Calculations

The apparent resistivity is calculated by dividing the primary voltage,  $V_p$ , by the current  $I_q$  flowing between the current electrodes,  $C_1$  and  $C_2$ , and multiplying by a geometrical factor appropriate to the electrode array being used. The apparent resistivity is expressed in ohm-meters.

### Electrode Array

The electrode array used was the gradient arrangement.

In this system the current electrodes  $C_1$  and  $C_2$  are placed a large distance apart compared to the potential electrode separation  $P_1 - P_2$ .

The current electrode separation  $C_1 - C_2$  was approximately 700 feet with a  $P_1 - P_2$  distance of 25 feet. Readings were taken at station intervals of 25 feet along the survey lines.

RESULTS

The results are presented in the form of profiles of both apparent resistivity and apparent chargeability at a scale of 1 inch = 50 feet, (Figures 1, 2).

## INTERPRETATION

### A. Nordenskiöld Coal Area Figure 1.

The Cairnes coal seam is located at station 0 and is approximately 32 feet wide. There is no indication of any major chargeability response corresponding to this location or any change in the decay rate as shown by the four chargeability curves. There is a local increase in the apparent resistivity but this is similar to values over other rock types on this line and could not therefore be used to determine the location of the main seam using the Induced Polarization method.

### B. Carmacks Area Figure 2.

This line crossed four coal seams at the Anvil coal mine. The sandstones and conglomerates give higher values than over the locations where coal was expected.

Readings were also taken over a coal exposure on the bank of the Yukon River in Carmacks confirming that the coals in this area give relatively low values compared to the other rocks in the area.

There are no obvious differences in the decay rate along this profile.

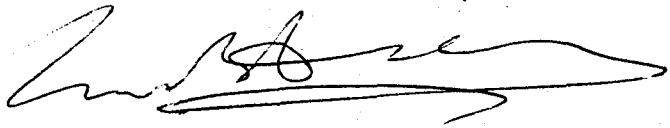
CONCLUSIONS AND RECOMMENDATIONS

The test work in the area has shown that there is very little response over the coal seams in contrast to what is expected in the foothills area.

The Induced Polarization method would be of little value to locate coals of similar quality in the Yukon area.

Respectfully submitted,

KENTING EXPLORATION SERVICES LIMITED

A handwritten signature in black ink, appearing to read 'T.R.B. Dundas', written over a horizontal line.

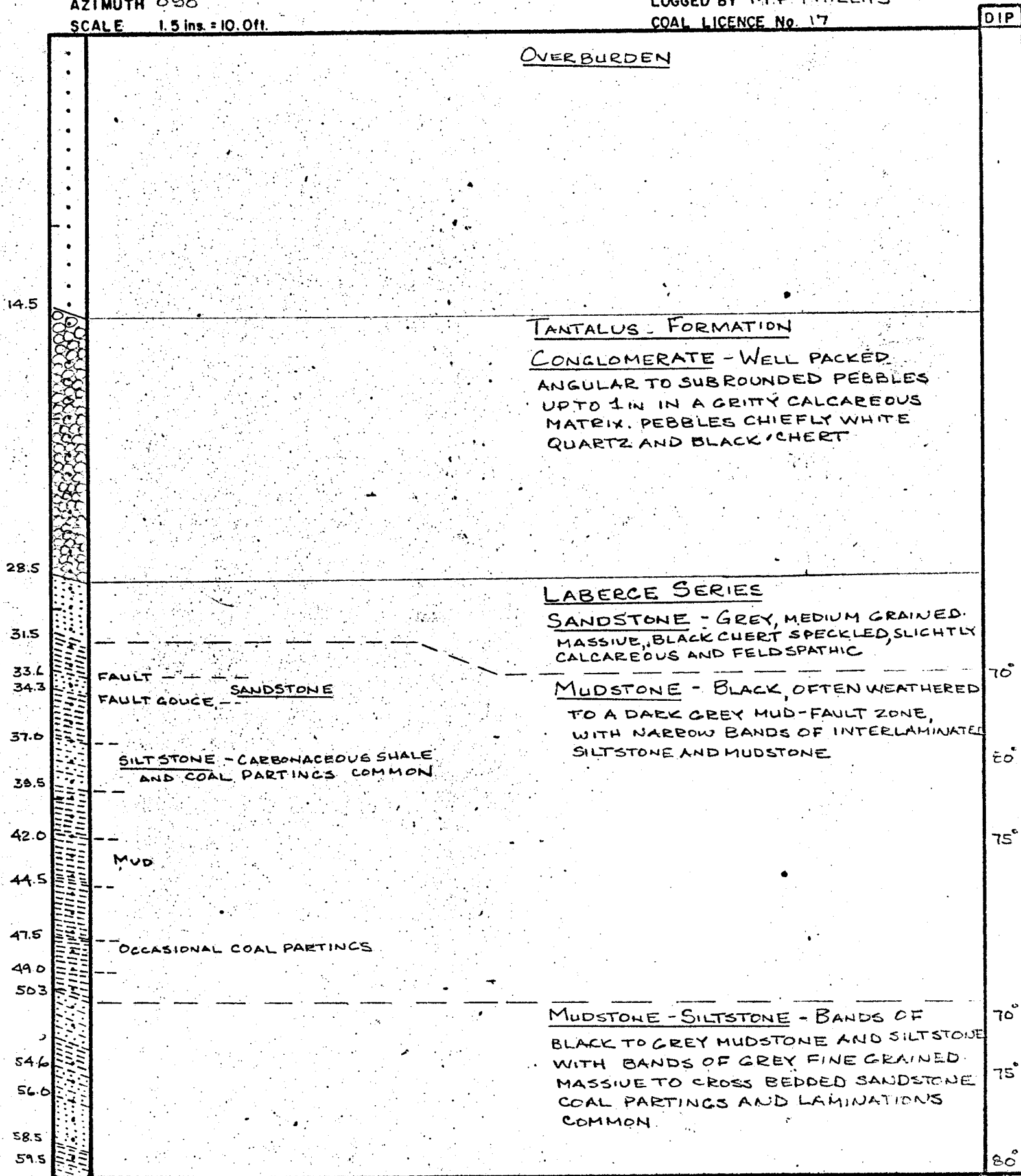
T.R.B. Dundas, M.Sc.  
Senior Geophysicist

J.E. Wyder, Ph.D., P.Eng.,  
Chief Geophysicist

DRILL HOLE LOG  
TESLIN EXPLORATION LTD.  
CARMACKS AREA

COORDINATES  
 ELEVATION  
 DIP - 60°  
 AZIMUTH 090°  
 SCALE 1.5 ins. = 10.0 ft.

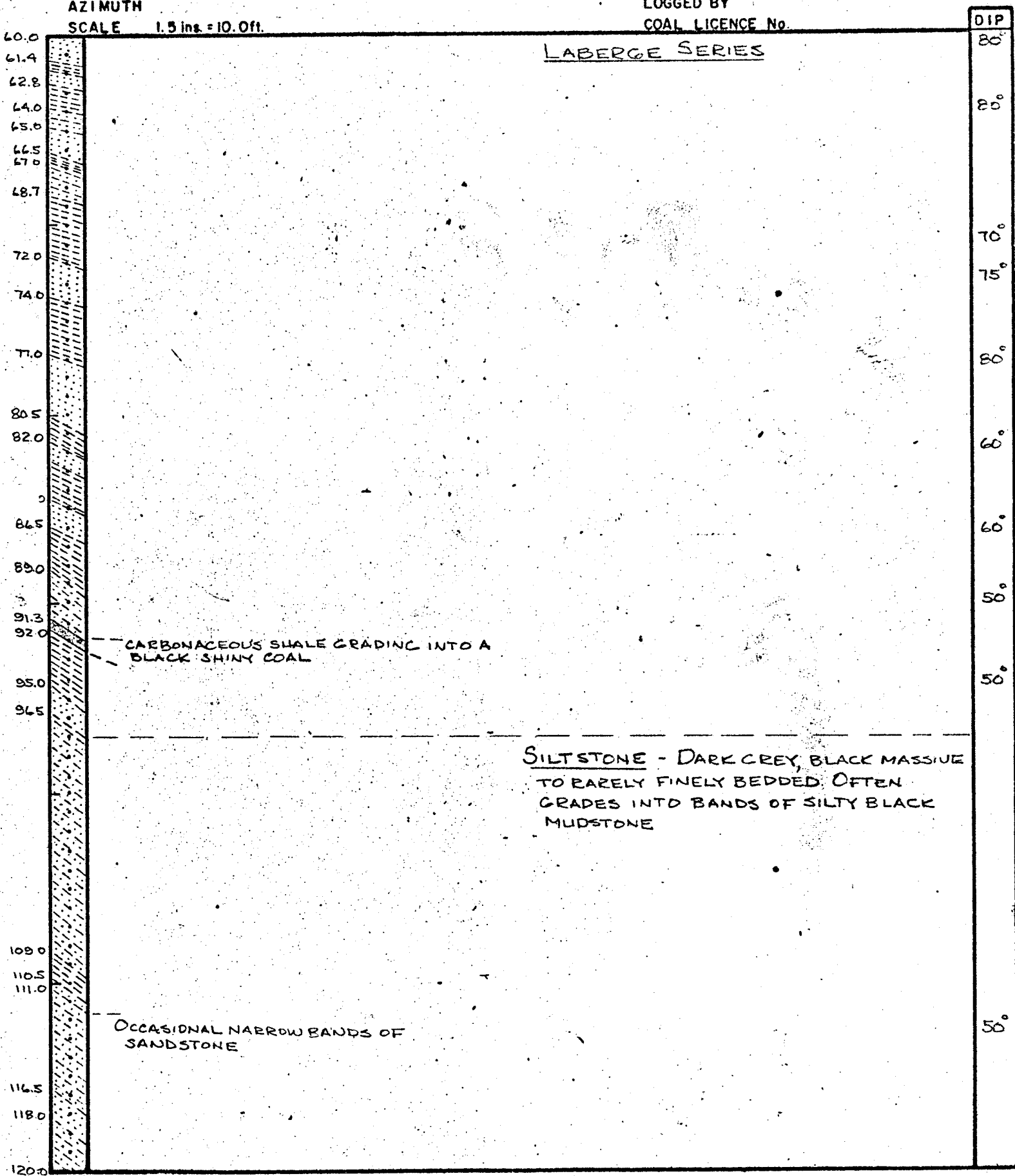
CORE SIZE HQ  
 HOLE STARTED OCTOBER 14, 1973  
 HOLE COMPLETED OCTOBER 19, 1973  
 LOGGED BY M.P. PHILLIPS  
 COAL LICENCE No. 17



DRILL HOLE LOG  
TESLIN EXPLORATION LTD.  
CARMACKS AREA

COORDINATES  
ELEVATION  
DIP  
AZIMUTH  
SCALE 1.5 ins. = 10.0 ft.

CORE SIZE  
HOLE STARTED  
HOLE COMPLETED  
LOGGED BY  
COAL LICENCE No.



LABERGE SERIES

CARBONACEOUS SHALE GRADING INTO A  
BLACK SHINY COAL

SILTSTONE - DARK GREY, BLACK MASSIVE  
TO RARELY FINELY BEDDED. OFTEN  
GRADES INTO BANDS OF SILTY BLACK  
MUDSTONE

OCCASIONAL NARROW BANDS OF  
SANDSTONE

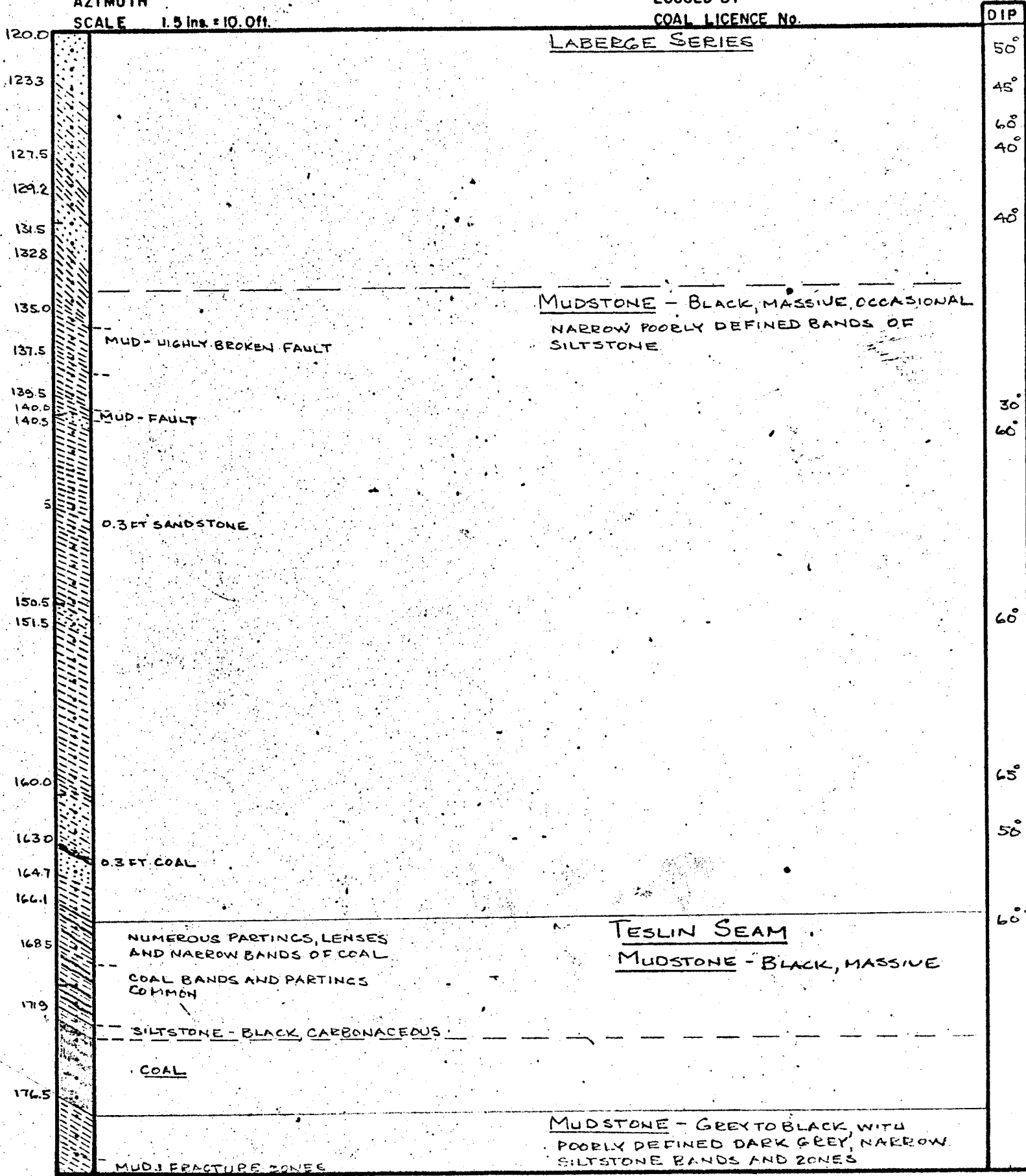
DIP  
80°  
80°  
70°  
75°  
80°  
60°  
60°  
50°  
50°  
50°

60.0  
61.4  
62.8  
64.0  
65.0  
66.5  
67.0  
68.7  
72.0  
74.0  
77.0  
80.5  
82.0  
86.5  
89.0  
91.3  
92.0  
95.0  
96.5  
109.0  
110.5  
111.0  
116.5  
118.0  
120.0

DRILL HOLE LOG  
TESLIN EXPLORATION LTD.  
CARMACKS AREA

COORDINATES  
ELEVATION  
DIP  
AZIMUTH  
SCALE 1.5 ins. = 10. Off.

CORE SIZE  
HOLE STARTED  
HOLE COMPLETED  
LOGGED BY  
COAL LICENCE No.

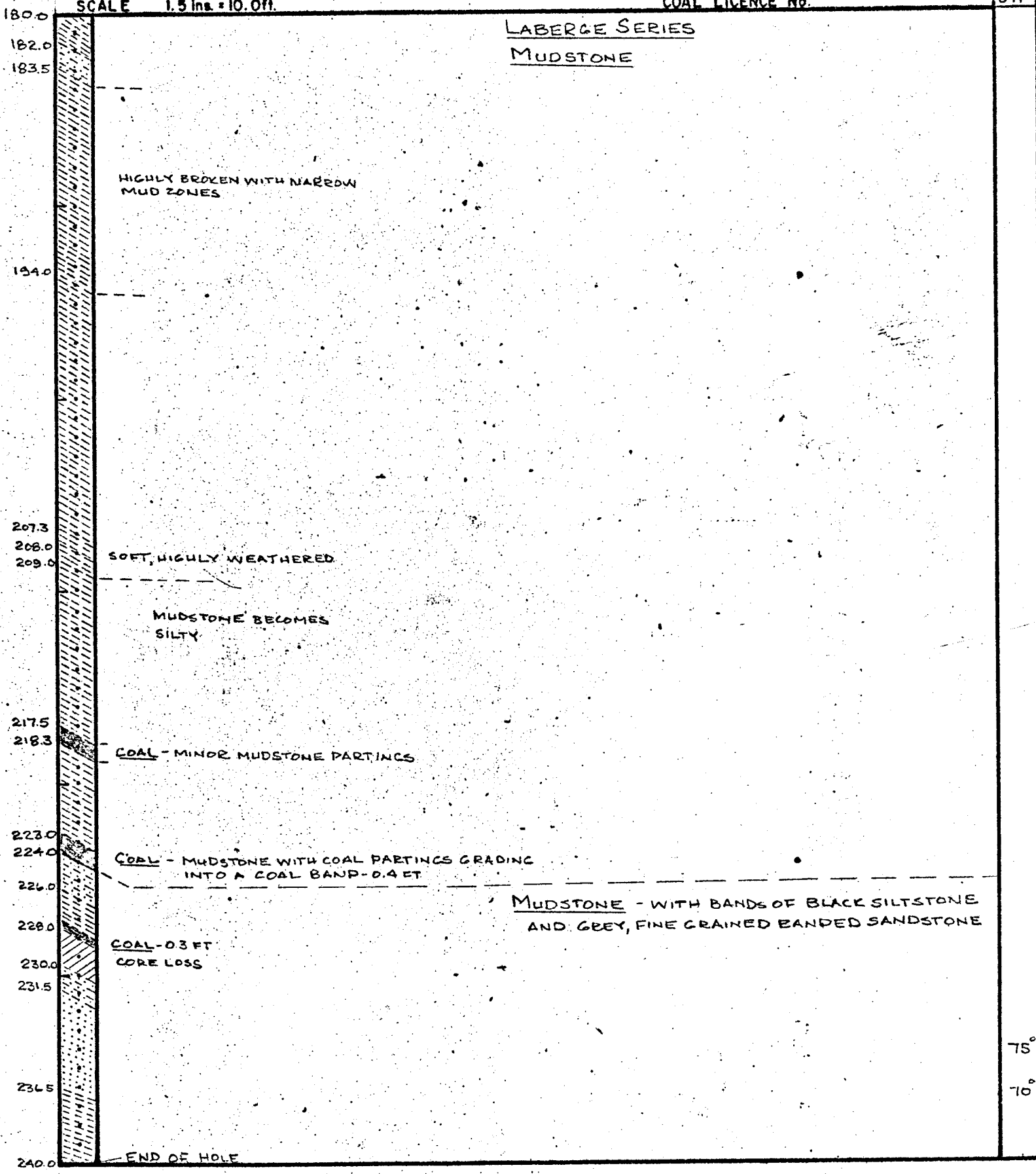


DRILL HOLE LOG  
TESLIN EXPLORATION LTD.  
CARMACKS AREA

COORDINATES  
ELEVATION  
DIP  
AZIMUTH  
SCALE 1.5 ins. = 10.0ft.

CORE SIZE  
HOLE STARTED  
HOLE COMPLETED  
LOGGED BY  
COAL LICENCE No.

DIP

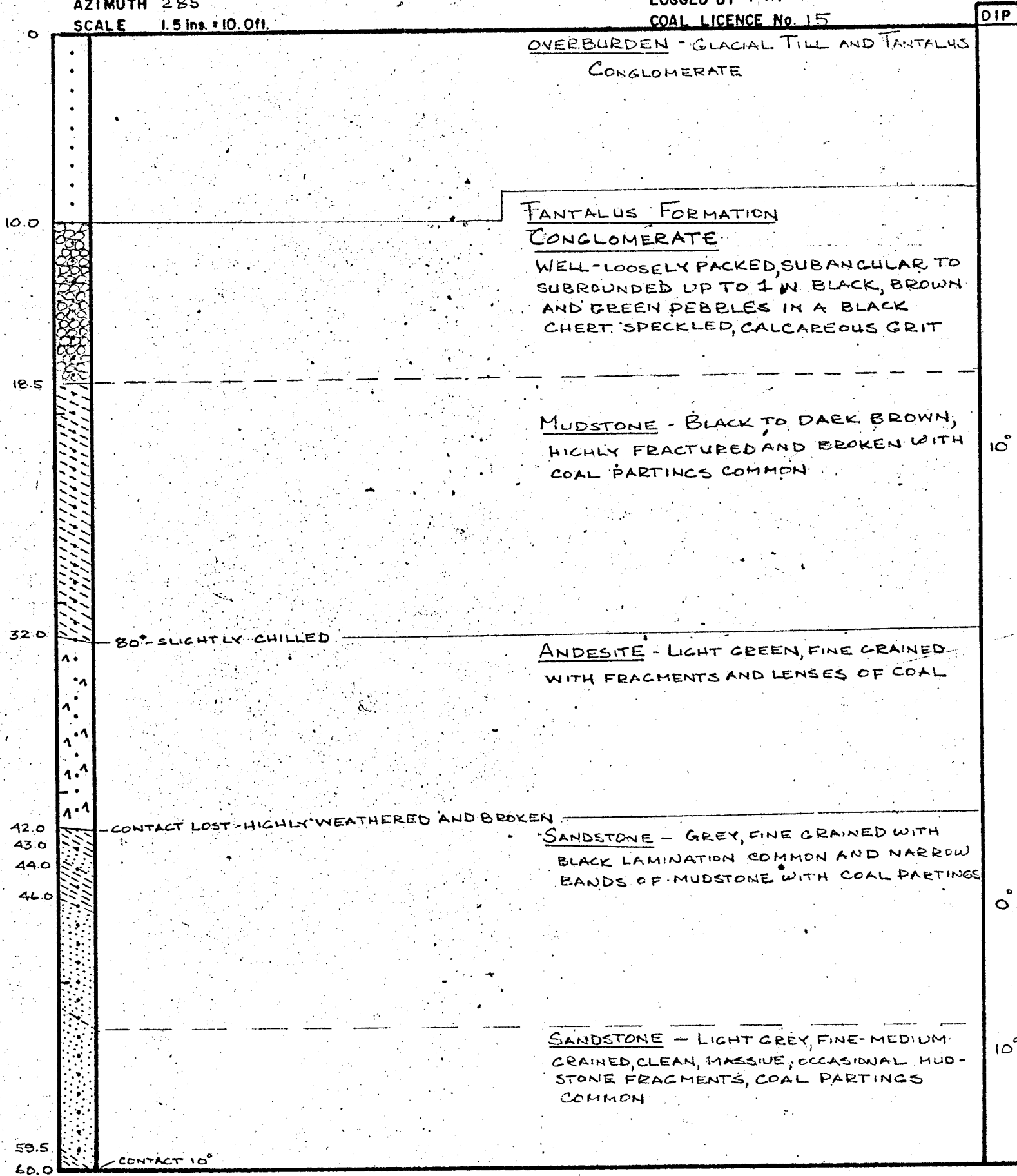


75°  
70°

DRILL HOLE LOG  
TESLIN EXPLORATION LTD.  
CARMACKS AREA

COORDINATES  
 ELEVATION  
 DIP - 50°  
 AZIMUTH 285°  
 SCALE 1.5 ins. = 10.0 ft.

CORE SIZE HQ  
 HOLE STARTED OCTOBER 21, 1973  
 HOLE COMPLETED OCTOBER 25, 1973  
 LOGGED BY M.P. PHILLIPS  
 COAL LICENCE No. 15



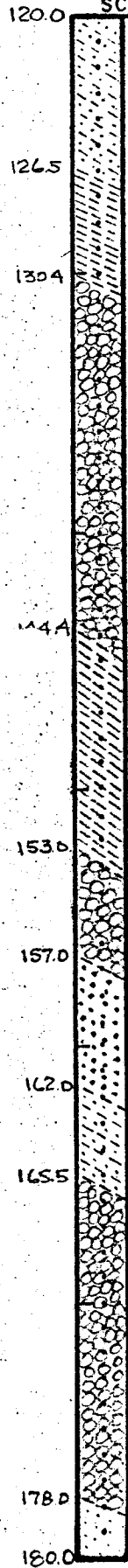


DRILL HOLE LOG  
TESLIN EXPLORATION LTD.  
CARMACKS AREA

COORDINATES  
ELEVATION  
DIP  
AZIMUTH  
SCALE 1.5 ins. = 10.0 ft.

CORE SIZE  
HOLE STARTED  
HOLE COMPLETED  
LOGGED BY  
COAL LICENCE No.

DIP



TANTALUS FORMATION

SILTSTONE - DARK GREY - BLACK, SHALY  
OFTEN GRADING INTO NARROW POORLY DEFINED  
BANDS OF VERY FINE GRAINED SANDSTONE  
RARE CARBONACEOUS SHALE AND COAL  
PARTINGS

MUDSTONE - BLACK AND DARK GREY,  
INTERBEDDED AND INTERLAMINATED

CONGLOMERATE - WELL PACKED, UP TO  
1 1/2 IN., SUBANGULAR TO SUB ROUNDED  
PEBBLES OF BLACK - LIGHT BROWN CHERT  
AND WHITE QUARTZ IN A CALCAREOUS  
GRT MATRIX

20° CONTACT

MUDSTONE - BLACK - DARK GREY, SLIGHTLY  
SILTY, MINOR SILT PARTINGS

CONGLOMERATE

GRIT - YELLOW, FELDSPATHIC, BLACK CHERT  
SPECKLED, SCATTERED SUB ROUNDED -  
SUBANGULAR PEBBLES UP TO 1 IN

20°

SILTSTONE - BLACK TO DARK GREY,  
GRADING INTO A BLACK MUDSTONE

CONGLOMERATE - OFTEN GRADING  
INTO A PEBBLY FELDSPATHIC GRIT

HIGHLY WEATHERED  
BLACK SAND - FAULT ZONE

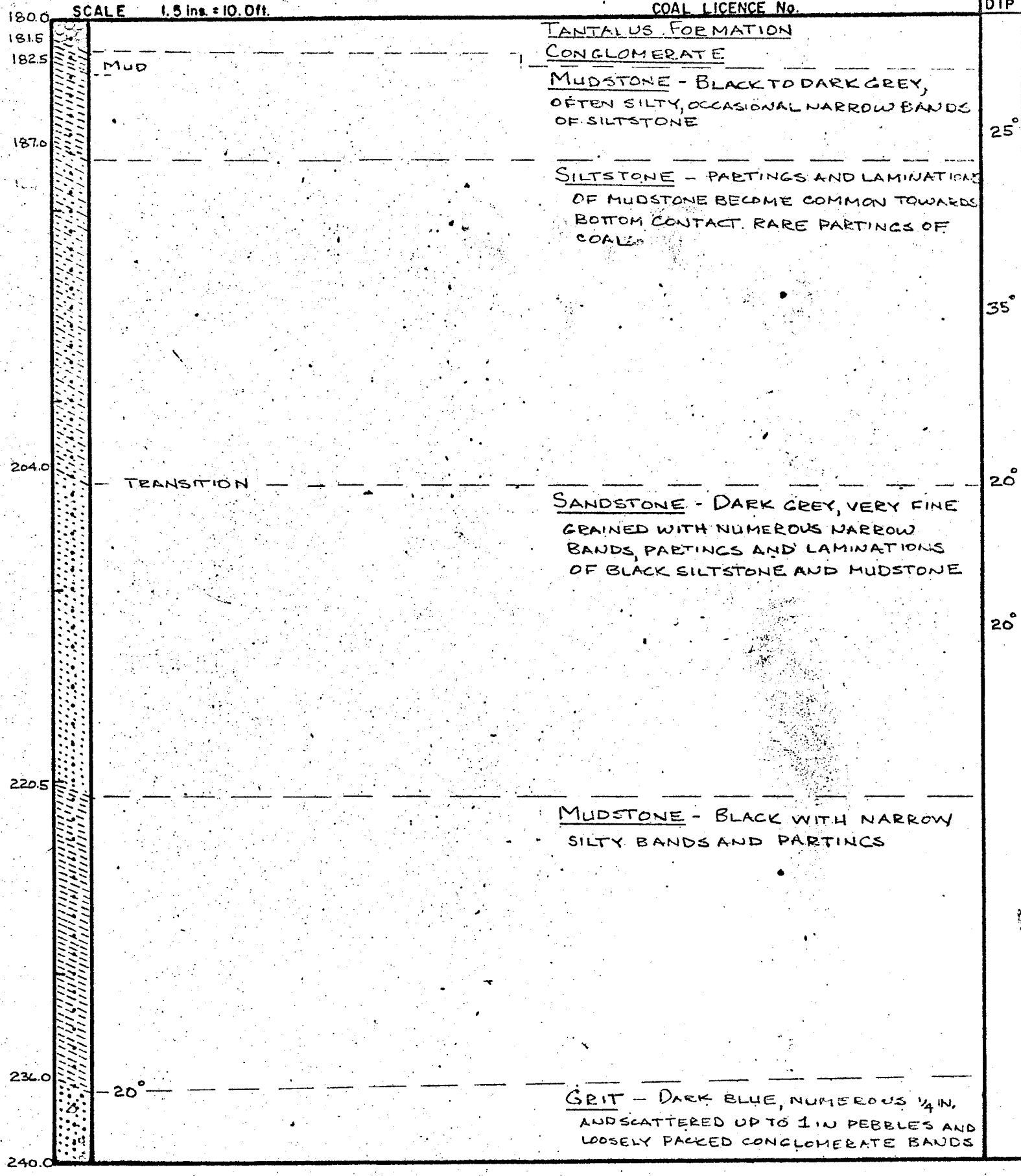
10°

20°

DRILL HOLE LOG  
TESLIN EXPLORATION LTD.  
CARMACKS AREA

COORDINATES  
 ELEVATION  
 DIP  
 AZIMUTH  
 SCALE 1.5 ins. = 10.0 ft.

CORE SIZE  
 HOLE STARTED  
 HOLE COMPLETED  
 LOGGED BY  
 COAL LICENCE No.



DRILL HOLE LOG  
TESLIN EXPLORATION LTD.  
CARMACKS AREA

COORDINATES  
ELEVATION  
DIP  
AZIMUTH  
SCALE 1.5 ins. = 10.0 ft.

CORE SIZE  
HOLE STARTED  
HOLE COMPLETED  
LOGGED BY  
COAL LICENCE No.

DIP

240.0

TANTALUS FORMATION

245.0

CONGLOMERATE - LOOSE TO WELL PACKED  
WITH OCCASIONAL NARROW PEBBLY  
BLUE GRIT BANDS

PARTINGS AND LENSES OF COAL AND  
CARBONACEOUS SHALE COMMON

252.5

LENSES AND BANDS UP TO 1/2 IN  
OF COAL

GRIT -

255.5

262.0

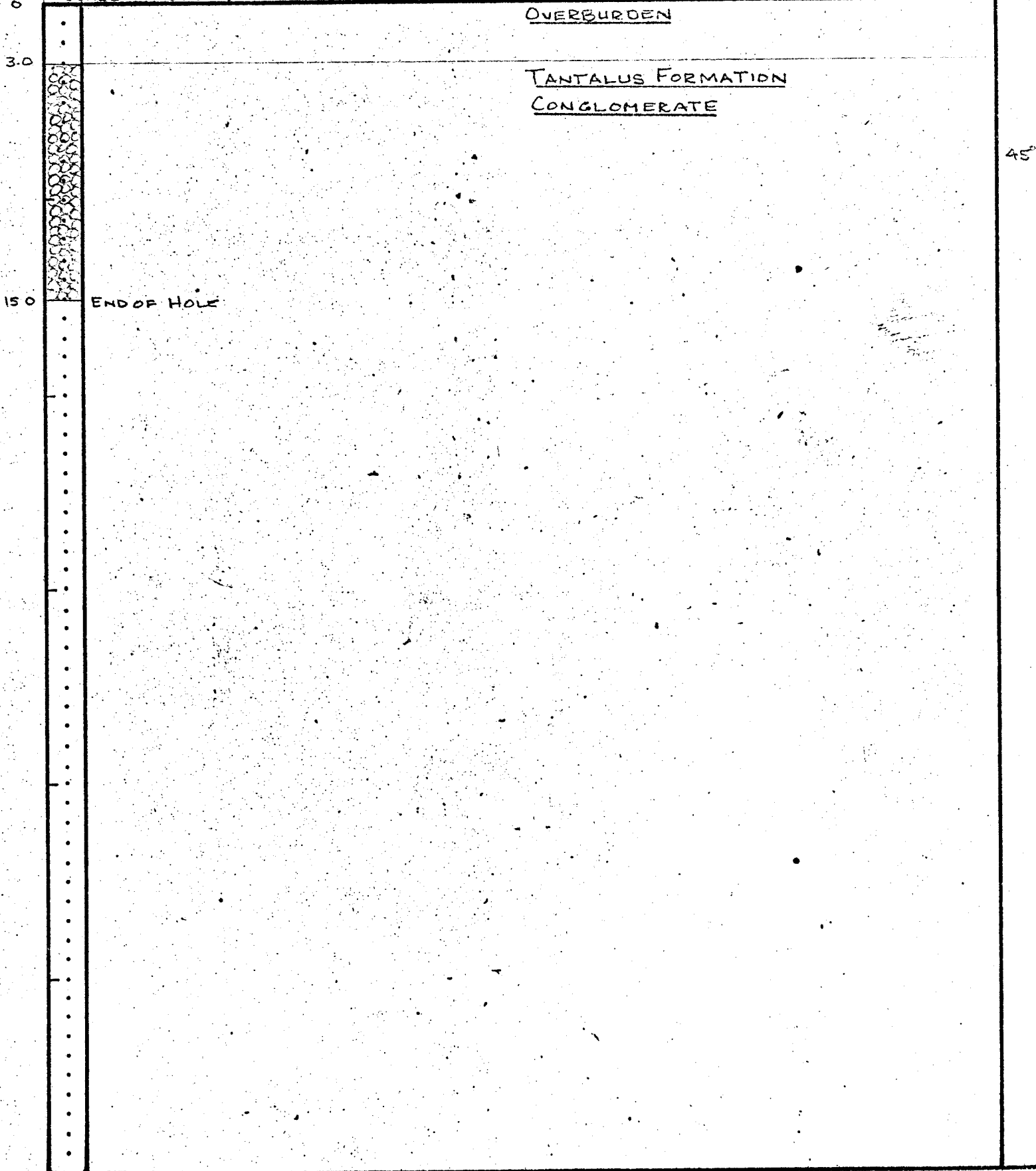
END OF HOLE

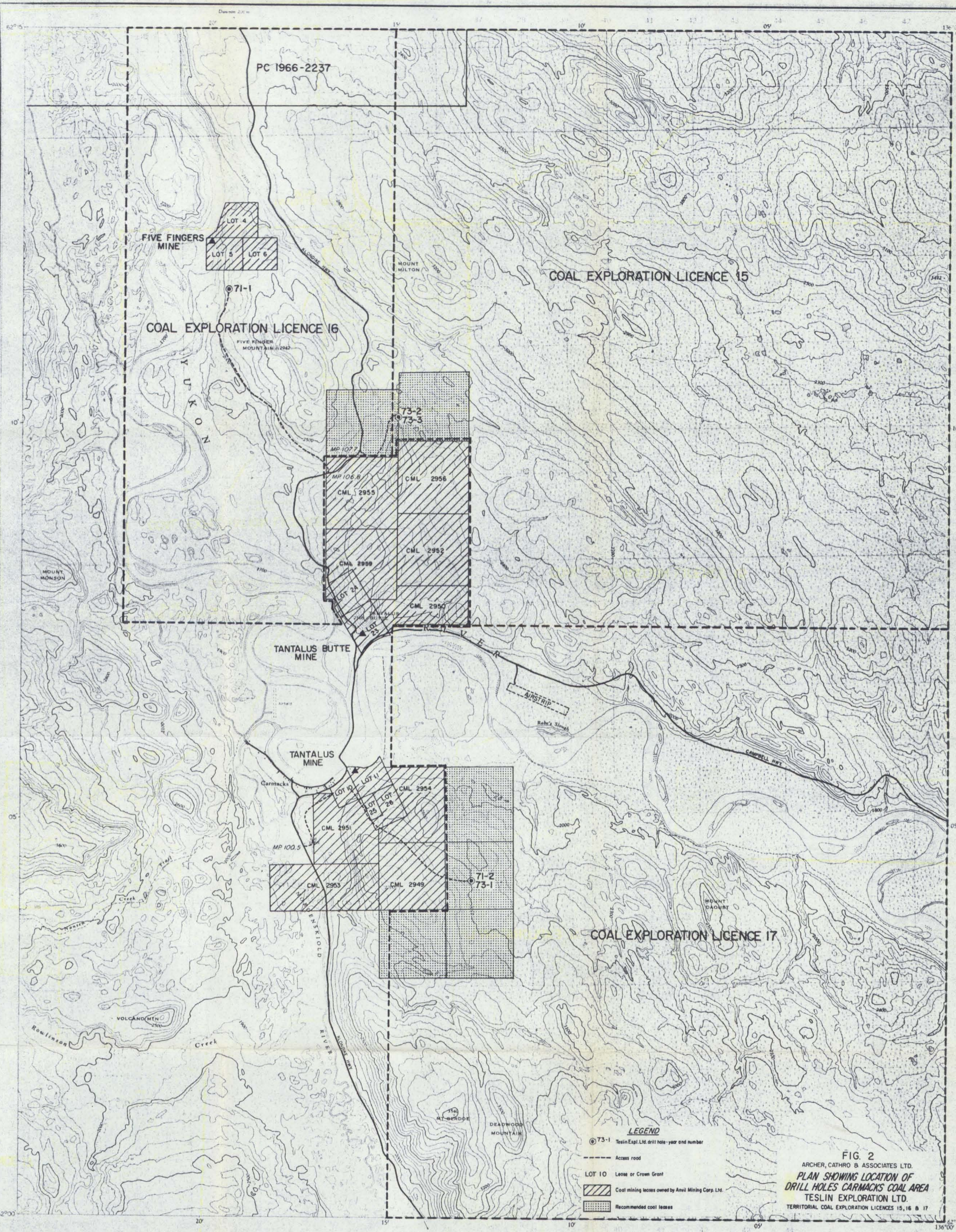
DRILL HOLE LOG  
TESLIN EXPLORATION LTD.  
CARMACKS AREA

COORDINATES  
ELEVATION  
DIP  
AZIMUTH  
SCALE 1.5 ins. = 10.0 ft.

CORE SIZE HQ  
HOLE STARTED OCTOBER 25, 1973  
HOLE COMPLETED OCTOBER 25, 1973  
LOGGED BY M.P. PHILLIPS  
COAL LICENCE No. 15

DIP

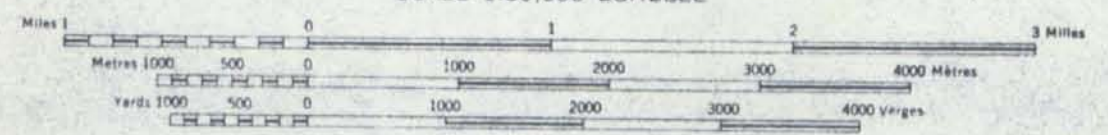




**FIG. 2**  
**ARCHER, CATHRO & ASSOCIATES LTD.**  
**PLAN SHOWING LOCATION OF**  
**DRILL HOLES CARMACKS COAL AREA**  
**TESLIN EXPLORATION LTD.**  
**TERRITORIAL COAL EXPLORATION LICENCES 15, 16 & 17**

(Joins Mount Morrison 115 H/16)  
**CARMACKS**  
**YUKON TERRITORY**

SCALE 1:50,000 ÉCHELLE



**CONTOUR INTERVAL 100 FEET**  
 Elevations in Feet above Mean Sea Level  
 North American Datum 1927  
 Transverse Mercator Projection

**EQUIDISTANCE DES COURBES: 100 PIEDS**  
 Élévations en pieds au-dessus du niveau moyen de la mer  
 Réseau géodésique nord américain unifié (1927)  
 Projection transverse de Mercator

**MAGNETIC DECLINATION 32°01' EAST**  
 AT CENTRE OF MAP 1963  
 Annual change (decreasing) 3'

Some names on this map are not yet official.  
 Corrections or additions are invited by the  
 Surveys and Mapping Branch.

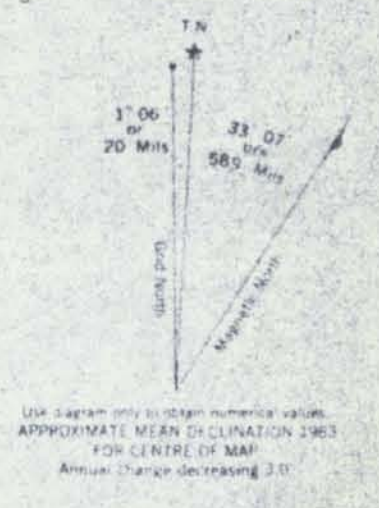
**LEGEND**

● 73-1	Tessin Expl. Ltd. drill hole - year and number	—	Access road
▭	Lease or Crown Grant	▨	Coal mining leases owned by Anvil Mining Corp. Ltd.
▩	Recommended coal leases		

Building	Édifice	Barn	Grange
Church	Église	Post Office	Bureau de poste
Lighthouse	Phare	Cemetery	Cimetière
River with bridge	Rivière avec pont		
Stream, intermittent or dry	Cours d'eau intermittent ou à sec		
Lake intermittent, indefinite	Lac intermittent, non-précise		
Marsh or Swamp	Marais ou marécage		
Depression contours	Courbes de cuvette		

Complète en 1963, par la DIRECTION DES LEVÉS ET DE  
 CARTOGRAPHIE, MINISTÈRE DES MINES ET DES RELEVÉS  
 TECHNIQUES, d'après les photographies aériennes prises  
 1947 et 1953, imprimée en 1965.

Ces cartes sont en vente au Bureau de distribution des  
 ministères des Mines et des Relevés techniques, Ottawa.



Use diagram only to obtain numerical values.  
 APPROXIMATE MEAN OF CLINATION 1963  
 FOR CENTRE OF MAP  
 Annual change decreasing 3'

NATIONAL TOPOGRAPHIC SYSTEM  
 SYSTÈME DE RÉFÉRENCE CARTOGRAPHIQUE NATIONAL

115 1/1  
 EDITION 2

FIG. 3

ARCHER, CATHRO & ASSOCIATES LTD.

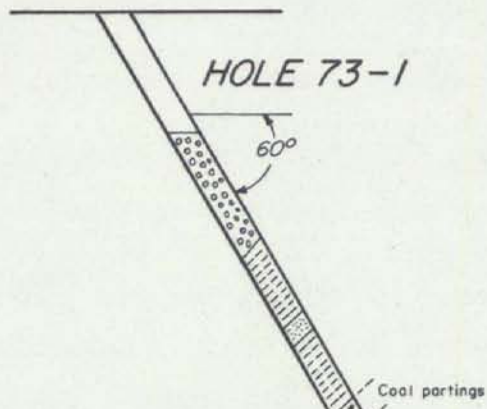
CROSS-SECTION HOLE 73-1

CARMACKS COAL AREA

TESLIN EXPLORATION LTD.

TERRITORIAL COAL LICENCE No. 17

SCALE IN FEET (HORIZONTAL & VERTICAL)



Cool partings

Coal

TESLIN SEAM

LEGEND

QUATERNARY	OVERBURDEN		Glacial fill and weathered bedrock
LOWER CRETACEOUS	TANTALUS FORMATION		Conglomerate
			Sandstone
			Siltstone
JURASSIC	LABERGE SERIES		Mudstone
			Coal

Coal 0.5'

Coal 0.3'

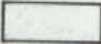



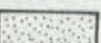
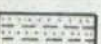
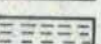

Coal 0.8'

Coal 0.3'

N 75° W

S 75° E

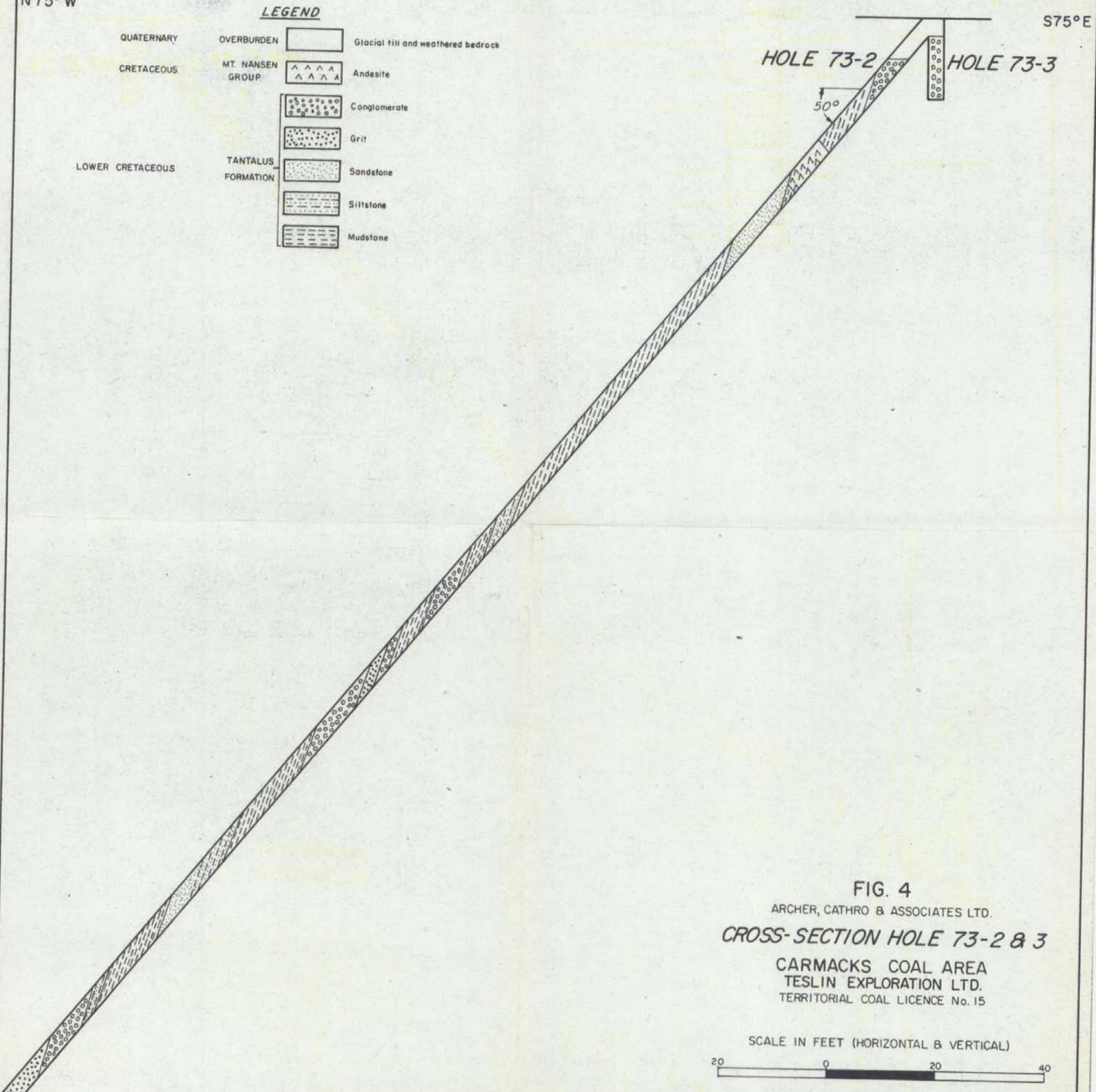
**LEGEND**

QUATERNARY	OVERBURDEN		Glacial till and weathered bedrock
CRETACEOUS	MT. NANSEN GROUP		Andesite
			Conglomerate
			Grit
			Sandstone
LOWER CRETACEOUS	TANTALUS FORMATION		Siltstone
			Siltstone
			Mudstone

HOLE 73-2

HOLE 73-3

50°



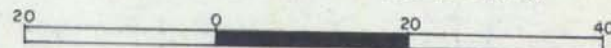
**FIG. 4**

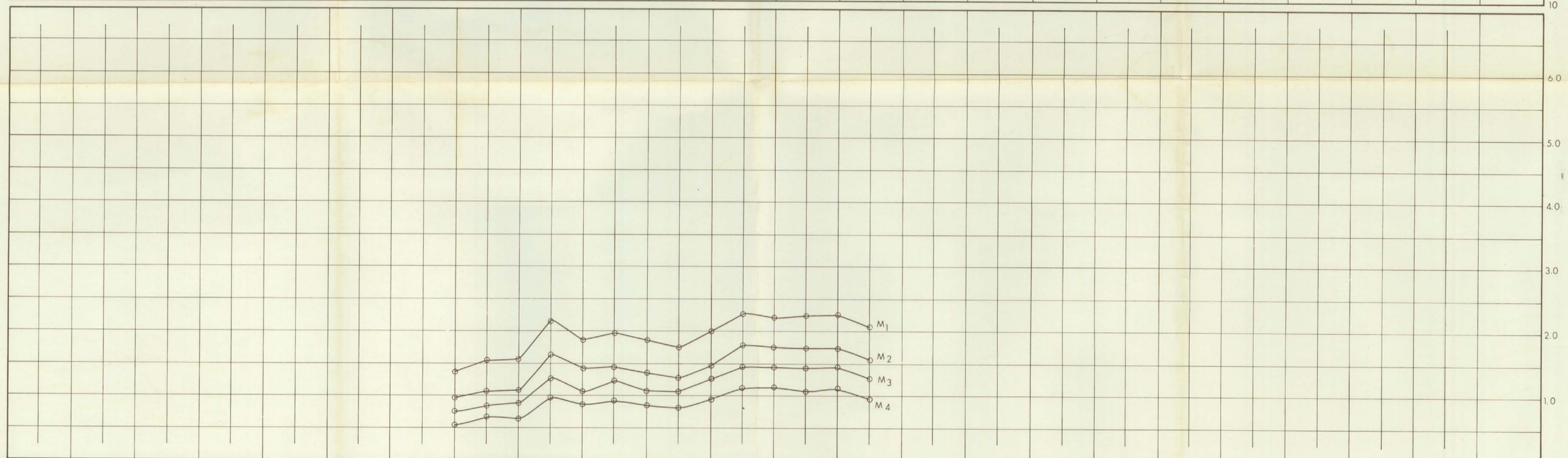
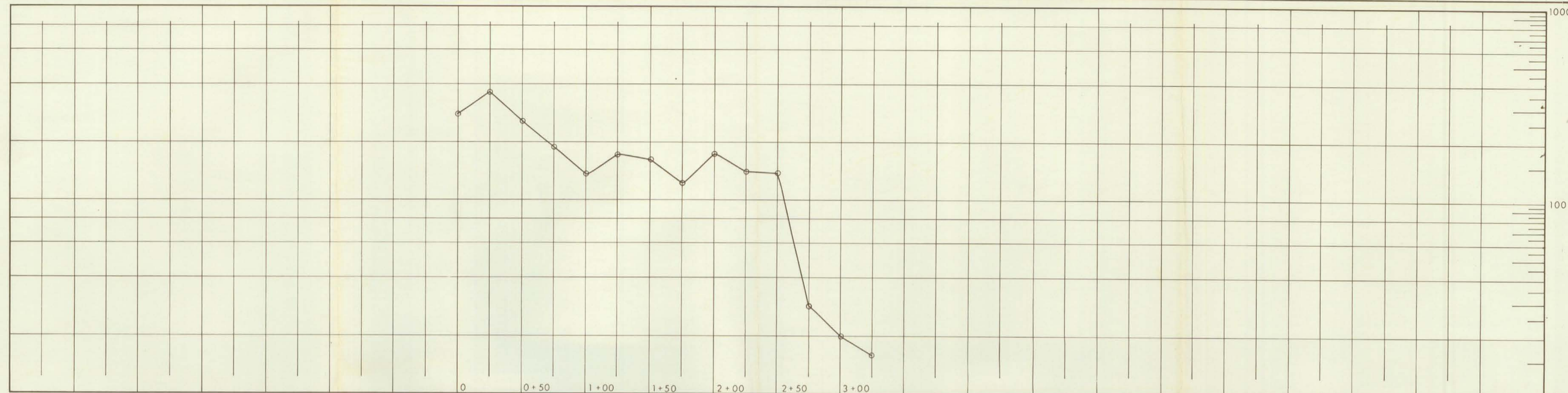
ARCHER, CATHRO & ASSOCIATES LTD.

**CROSS-SECTION HOLE 73-2 & 3**

CARMACKS COAL AREA  
TESLIN EXPLORATION LTD.  
TERRITORIAL COAL LICENCE No. 15

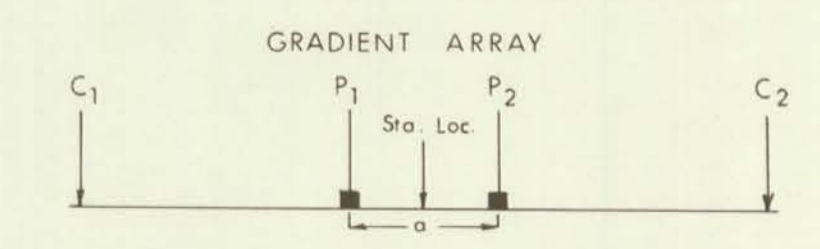
SCALE IN FEET (HORIZONTAL & VERTICAL)





INDUCED POLARIZATION SURVEY  
 HUNTEC MARK III RECEIVER  
**PROFILE LINE-CARMACKS**  
 ARJAY KIRKER RESOURCES LTD.

- LEGEND**
- INTERPRETIVE CAUSATIVE BODY  PROBABLE
  - RECOMMENDED D DRILL HOLE  POSSIBLE
  - ELECTRODE SEPARATION  o = 25'



HORIZONTAL SCALE 1 inch = 50 feet  
 VERTICAL SCALES  
 APPARENT CHARGEABILITY 1 inch = 1 percent of Vp  
 RESISTIVITY 3 inches = 1 logarithmic cycle (ohm-meter)

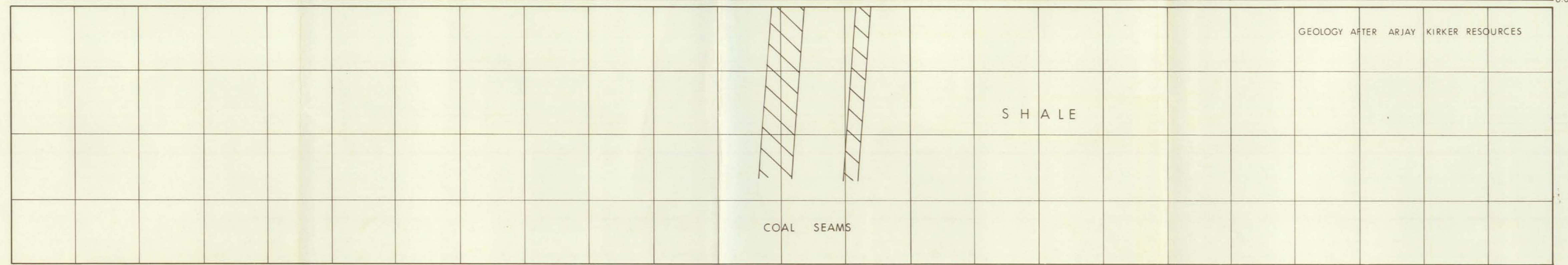
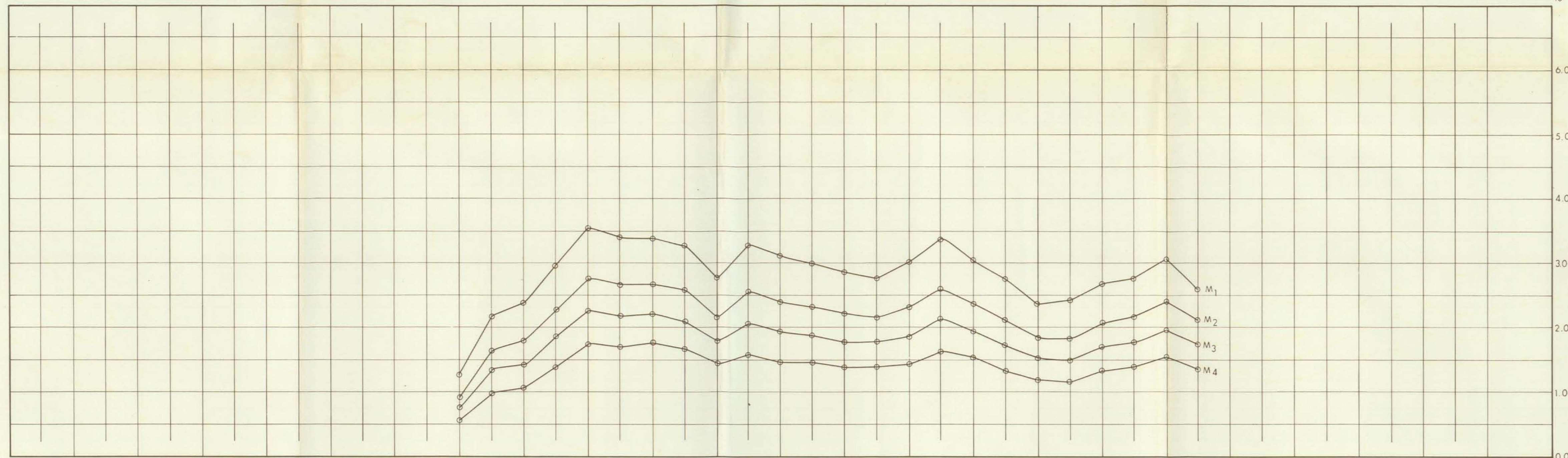
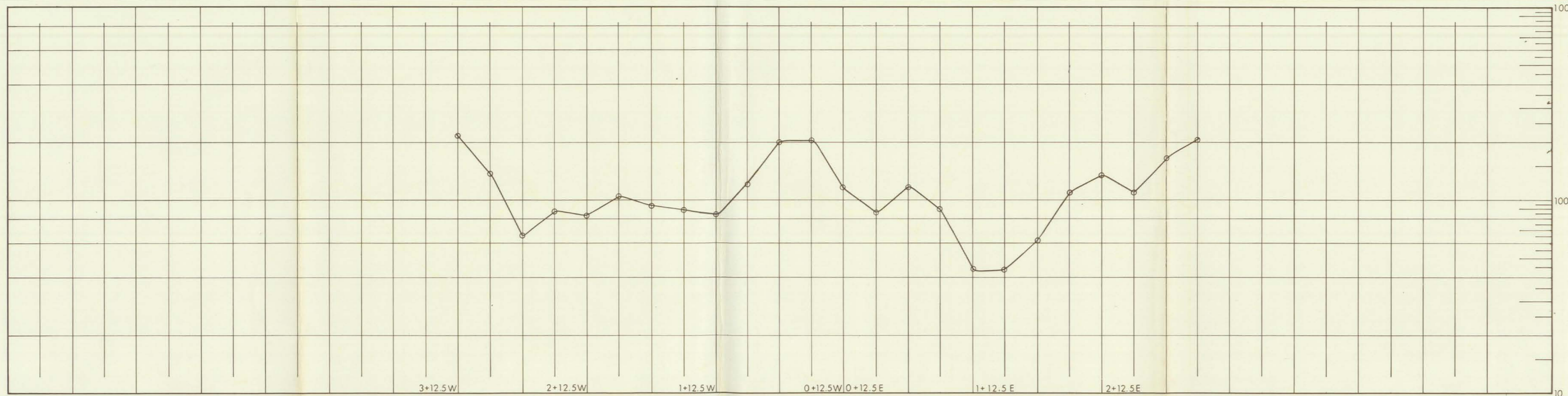
**INSTRUMENT PARAMETERS**

RECEIVER: ON 2.0 sec.  
 OFF 2.0 sec.  
 DELAY 0.03 sec.  
 INTEGRATE 0.03 sec.

TRANSMITTER: 10.0 kilowatt

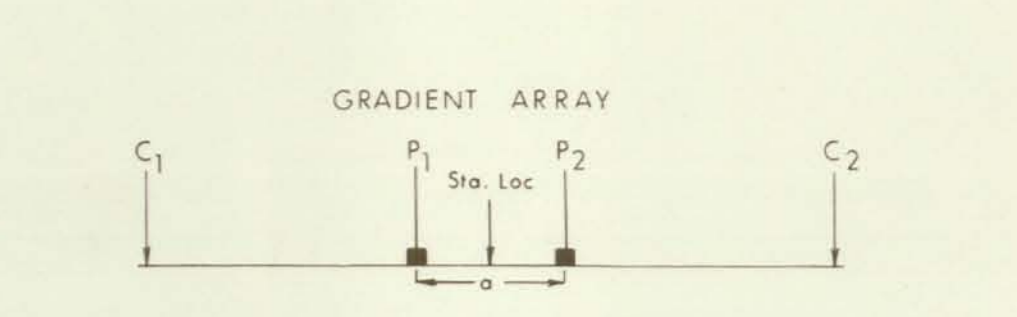
TO ACCOMPANY REPORT BY: T R B DUNDAS M. Sc DIC

**Kentna**  
 EXPLORATION SERVICES LIMITED CALGARY, ALBERTA



INDUCED POLARIZATION SURVEY  
 HUNTEC MARK III RECEIVER  
**PROFILE LINE-0**  
 NORDENS KIOLD AREA  
 ARJAY KIRKER RESOURCES LTD.

**LEGEND**  
 INTERPRETIVE CAUSATIVE BODY  
 RECOMMENDED D DRILL HOLE  
 ELECTRODE SEPARATION



HORIZONTAL SCALE 1 inch = 50 feet  
 VERTICAL SCALES  
 APPARENT CHARGEABILITY 1 inch = 1 percent of Vp  
 RESISTIVITY 3 inches = 1 logarithmic cycle (ohm-meter)

**INSTRUMENT PARAMETERS**  
 RECEIVER: ON 2.0 sec.  
 OFF 2.0 sec.  
 DELAY 0.03 sec.  
 INTEGRATE 0.03 sec.  
 TRANSMITTER: 100 kilowatt

TO ACCOMPANY REPORT BY:  
 T R B DUNDAS M.Sc. D.I.C.  
 KENTRO EXPLORATION SERVICES LIMITED CALGARY, ALBERTA  
 JOB NO. 2011 FIG. NO. 1