

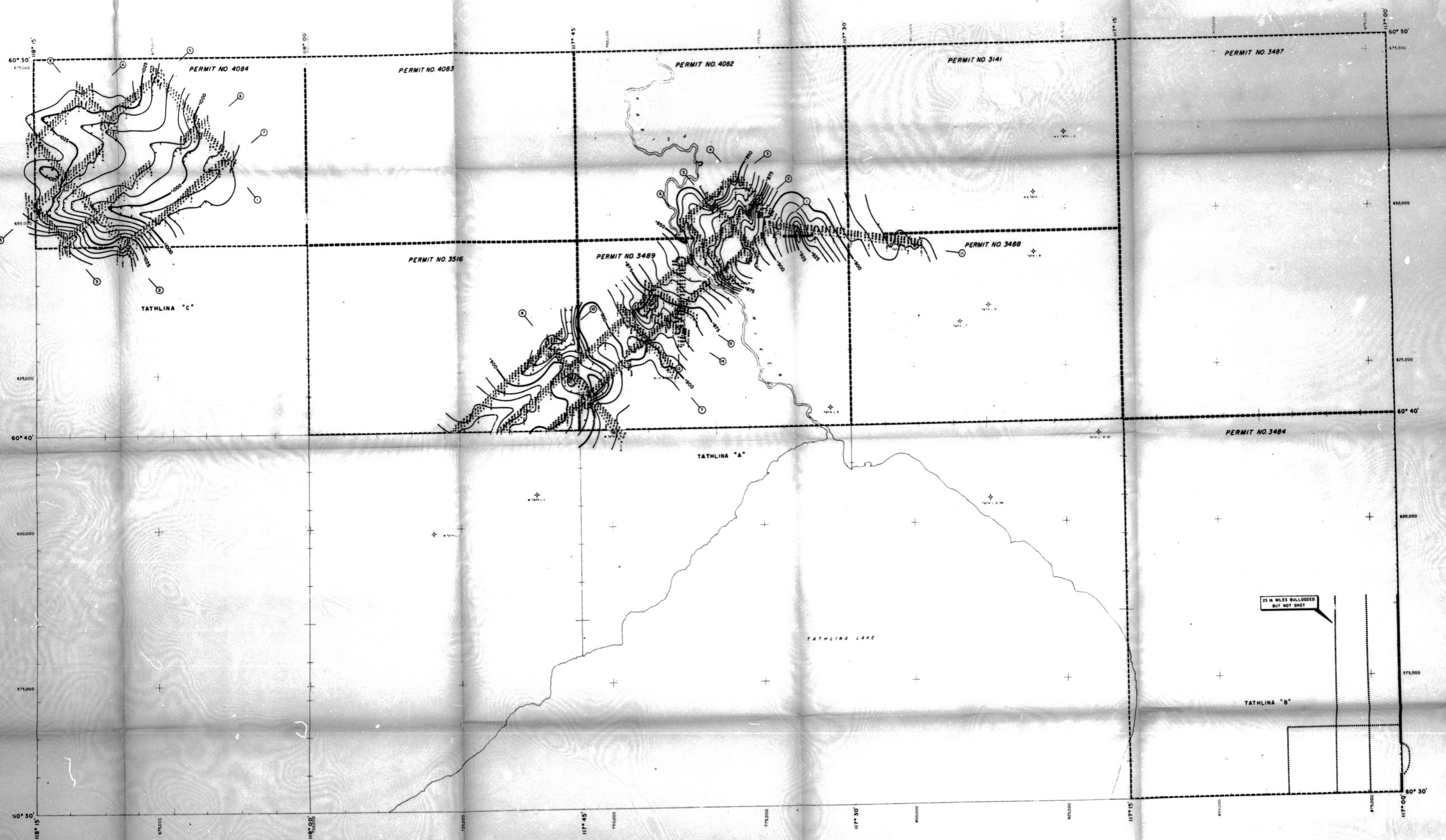


PLACID OIL COMPANY
 SEISMIC REVIEW OF
 TATHLINA LAKE AREA - N.W.T.
 SLAVE POINT REFLECTION TIME

SEISMIC DATUM PLANE: 1000 FEET CONTOUR INTERVAL: 0.0 SEC
 DATUM VELOCITY: 15,000 FT/SEC DATE: NOVEMBER 30, 1947
 SCALE: 1 INCH = 1 MILE

J. A. LEGGE AND ASSOCIATES LTD.
 GEOPHYSICAL CONSULTANTS

SCALE
 0 1 2 3



PLACID OIL COMPANY
SEISMIC REVIEW OF
TATHLINA LAKE AREA - N.W.T.
SURFACE ELEVATION
SEISMIC DATUM PLANE
CONTOUR INTERVAL 5 FEET
DATUM VELOCITY
5000 FEET/SECOND
SCALE NOVEMBER 20, 1987
SCALE 1 INCH = 1 MILE
J A LEGGE AND ASSOCIATES LTD.
GEOPHYSICAL CONSULTANTS

391-6-4-7.

REPORT ON A SEISMOGRAPH SURVEY

OF THE

TATHLINA LAKE AREA, N.W.T.

Permit Nos. 3484, 3487, 3488, 3489, 3516,
4082, 4083, and 4084.

FOR

PLACID OIL COMPANY

CALGARY, ALBERTA

J. A. LEGGE AND ASSOCIATES LTD.

GEOPHYSICAL CONSULTANTS

CALGARY, ALBERTA

REPORT ON A SEISMOGRAPH SURVEY

of the

TATHLINA LAKE AREA, N. W. T.

PERMIT NOS. 3484, 3487, 3488, 3489, 3516,
4082, 4083, and 4084.

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GEOPHYSICAL CONSULTANTS

CALGARY, ALBERTA.



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II) MAPS (In Pocket):

Scale: 1 Inch = 1 Mile.

1. Surface Elevation.
2. Slave Point Reflection Time.



INTRODUCTION:

The Tathlina Lake Area is situated between Tathlina and Kakisa Lakes, approximately 60 miles west of the town of Hay River, N.W.T. and is made up of Permits 3484, 3487, 3488, 3489, 3516, 4082, 4083 and 4084.

Geologically, the prospect lies on the east flank of the Tathlina Uplift. Devonian shales and limestones outcrop in some parts of the area but are mostly overlain with 10 to 50 feet or more of sparsely wooded muskeg. The Slave Point formation is approximately 2500 feet below the surface.

A seismograph survey was conducted in certain portions of the area by Beaver Geophysical Services Ltd. between January 4 and January 10 and between February 22 and April 3, 1967. The purpose of the work was to evaluate portions of the above named permits with particular attention being paid to the Slave Point formation.

A total of 85 miles of 300% common depth point shooting were recorded. Record sections were prepared by Canadian Magnetic Reduction Ltd., Geophysical Service Inc., and Petty Laboratories Inc.

FIELD OPERATIONS AND PROCEDURES:

The work was hampered by a general lack of frost in the muskeg resulting from deep and early snow. The first attempt to shoot the program in January was finally halted on the 10th when the crew caught up to the bulldozers. More line was then opened up and the crew moved in again on February 22 and stayed until April 3.

Field operations were conducted from a trailer camp located near the center of the prospect. In the later stages a helicopter was needed to co-ordinate bulldozing and shooting which were being carried on in three separate areas from the same camp.

The following is a summary of the operational techniques used in the seismograph survey:

Amplifiers	S. I. E. PT-100.
Magnetic Tape Unit	PMR-20 FM.
Filter on Tape	1/20 - 100.
Geophones	EVS-2, 8 per trace over 150 feet.
Spread	1800 foot symmetrical splits. 300% Stack.
Hole Spacing	600 feet (drilled on group flag).
Pattern Holes	3 Holes - 50 feet apart. 2 Holes - 100 feet apart.
Shooting Depth	40 feet.
Charge Size	1-1/4 lb. in each hole.
Drills	4 Conventional.
Extra Water Trucks	4.

In addition to the seismograph work outlined above a further 23-1/2 miles of line were cut in the southeast corner of Permit 3484 but they could not be shot because of the onset of spring break-up. The location of these lines on the map is only approximate since the horizontal survey was not completed prior to the departure of the crew. This area is extremely swampy and any future work should be planned : a time of optimum frost conditions.

QUALITY OF DATA:

Record quality was extremely variable over the prospect. Some muskeg areas produced only low frequency, unuseable records while shot holes drilled directly into the Devonian gave good high frequency results. The best records were found to be on Line 11 in Permit 3488 and on the majority of the shooting in Permit 4084.

In an effort to improve record quality, three hole

patterns were used in the early shooting but difficult drilling later forced a switch to two holes. This latter procedure still showed a significant improvement over the single hole.

The only mapable event in the area was the reflection originating from the Slave Point and this pulse was used as a smoothing and stacking guide in the preparation of the record sections. On the sections prepared by G. S. I. the zone below the Slave Point often showed energy but it was not consistent enough to identify or map.

COMPUTATIONS:

(a) Seismograms:

All seismograms were corrected to a flat datum of 1000 feet above sea level by means of a datum velocity of 15,000 feet per second. Delay time corrections were also applied to correct for the intermediate velocity layer but these rarely exceeded .003 second.

(b) Record Sections:

The 300% stacked structural record sections prepared by G. S. I. were processed digitally and are corrected to the same datum as the seismograms.

(c) Maps:

The seismic reflection times for the Slave Point map were taken from the seismograms and are thus corrected to the same datum.

The contour interval of .010 second represents approximately 55 feet of relief.

MAPS:

Two maps are included with this report:

- 1) Surface Elevation.
- 2) Slave Point Reflection Time.

The Slave Point reflection is a good, easily correlated pulse over most of the area. It should be noted, however, that no direct tie exists between the shooting in Permit 4084 and the rest of the prospect. Consequently, the reflection times should be compared only within each separate area.

Datum corrections are considered to be fairly reliable and thus the structural picture presented should be reasonably accurate.

RESULTS:

The Slave Point topography is marked by many highs and lows, most of which appear to be tectonic in origin since the underlying reflections usually are conformable.

Several faults are indicated which have resulted in Slave Point features of sufficient magnitude to warrant the

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drilling of test holes. The best of these is immediately east of Tathlina Lake #5 where a down to the east fault has resulted in over 150 feet of relief.

Another fault is postulated northwest of West Tathlina Lake #3 although data here is extremely poor.

The West Tathlina Lake #4 dry hole is drilled on a feature which, although it does not appear fault controlled, shows about 100 feet of northwest dip.

An extremely disturbed area was noted at the intersection of Lines 2 and 8 in Permit 3516. Interpretation of the data is difficult but the overall result appears to be a valid low immediately to the south and a resultant closed high on Line 1 at S. P. 320.

The area to the northwest in Permit 4084 shows the Slave Point to be dipping to the south. The most promising lead here is a Slave Point reversal on Line 7 at S. P. 121. Reflections in the zone below the Slave Point are interrupted and give

indications of what might optimistically be interpreted as a small reef development.

The only other lead in this Permit is a small reversal on Line 1 near S. P. 101 but north closure is only postulated.

CONCLUSIONS:

The majority of the good Slave Point highs are marked by abandoned holes. However, two new locations are indicated which may be deserving of tests. These are:

- 1) Permit 4084, Line 7, S. P. 121.
- 2) Permit 3489, Line 1, S. P. 320.

Other slight highs occur in the central portion of the map at the intersection of Lines 13, 12, and 1, at the intersection of Lines 1 and 7, at the intersection of Lines 3

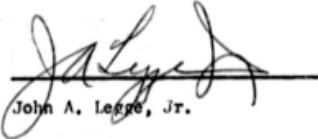
and 5, and at the intersection of Lines 3 and 4. However, the lack of good closure and the small magnitude of reversal make them rather weak leads.

Respectfully submitted,

J. A. LEGGE AND ASSOCIATES LTD



J. R. Wilson.



John A. Legge, Jr.

November 30, 1967.

REPORT ON A SEISMOGRAPH SURVEY

of the

KAKISA RIVER AREA, N. W. T.

PERMIT NOS. 1526 AND 3141

for

PLACID OIL COMPANY,

CALGARY, ALBERTA.

J. A. LEGGE AND ASSOCIATES LTD.

GEOPHYSICAL CONSULTANTS

CALGARY, ALBERTA.

T A B L E O F C O N T E N T S

I) WRITTEN REPORT:

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Quality of Data	4
Computations	5
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Conclusions	7

II) MAPS (In Pocket):

Scale: 1 Inch = 1 Mile.

1. Surface Elevation.
2. Slave Point Reflection Time. *Not measured*

INTRODUCTION:

The Kakisa River Area is situated between Tathlina and Kakisa Lakes, approximately 60 miles west of the town of Hay River, N. W. T. and is made up of Permits 1526 and 3141.

Geologically, the prospect lies on the east flank of the Tathlina Uplift. Devonian shales and limestones outcrop in some parts of the area but are mostly overlain with 10 to 50 feet or more of sparsely wooded muskeg. The Slave Point formation is approximately 2500 feet below the surface.

A seismograph survey was conducted in certain portions of the area by Beaver Geophysical Services Ltd. between February 22 and March 8, 1967. The purpose of the work was to evaluate portions of the above named permits with particular attention being paid to the Slave Point formation.

A total of 16.5 miles of 300% common depth point shooting were recorded. Record sections were prepared by Geophysical Service Inc.

FIELD OPERATIONS AND PROCEDURES:

The work was hampered by a general lack of frost in the muskeg resulting from deep and early snow. Bulldozers as well as trucks had trouble and broke through frequently.

Drilling was slow and difficult since many of the holes encountered 20 to 30 feet of limestone with gravel and boulders near the surface. Four conventional rigs were used as well as four extra water trucks.

Field operations were conducted from a trailer camp located near the center of the prospect.

The following is a summary of the operational techniques used in the seismograph survey:

Amplifiers	S. I. E. PT-100.
Magnetic Tape Unit	PMR-20 FM.
Filter on Tape	1/20 - 100.
Geophones	EVS-2. 8 per trace over 150 feet.
Spread	1800 foot symmetrical splits. 300% Stack.
Hole Spacing	600 feet (drilled on group flag).
Pattern Holes	3 Holes - 50 feet apart. 2 Holes - 100 feet apart.
Shooting Depth	40 feet.
Charge Size	1-1/4 lb. in each hole.
Drills	4 Conventional.
Extra Water Trucks	4.

QUALITY OF DATA:

Record quality was extremely variable over the prospect. Some muskeg areas produced only low frequency, unuseable records while shotholes drilled directly into the Devonian gave good, high frequency results. The best records were found in the northern portion of the permit on Lines 2 and 10. Line 9 was generally poor as was the south end of Line 1. Little or no data was available in the vicinity of West Tathlina Lake No. 1.

In an effort to improve record quality, three hole patterns were used in the early shooting but difficult drilling later forced a switch to the two outside holes only. This latter procedure still showed a significant improvement over the single hole.

The only mapable event in the area was the reflection originating from the Slave Point and this pulse was used as a smoothing and stacking guide in the preparation of record sections. The zone below the Slave Point often showed energy but it was not consistent enough to identify or map.

COMPUTATIONS:

(a) Seismograms:

All seismograms were corrected to a flat datum of 1000 feet above sea level by means of a datum velocity of 15,000 feet per second. Delay time corrections were also applied to correct for the intermediate velocity layer but these rarely exceeded .003 second.

(b) Record Sections:

The 300% stacked structural record sections prepared by G. S. I. were processed digitally and are corrected to the same datum as the seismograms.

(c) Maps:

The seismic reflection times for the Slave Point map were taken from the seismograms and are thus corrected to the same datum.

The contour interval of .010 second represents approximately 55 feet of relief.

MAPS:

Two maps are included with this report:

- 1) Surface Elevation.
- 2) Slave Point Reflection Time.

The Slave Point reflection is a good, easily correlated pulse over most of the area when record quality permits. Datum corrections are considered to be fairly reliable and thus the structural picture presented should be reasonably accurate.

RESULTS:

The Slave Point topography is marked by a series of highs and lows, most of which appear to be tectonic in origin since the underlying reflections are conformable.

Two faults have been suggested on Line 1 at shotpoints 494 and 514. These are of a minor nature and do not appear to create prospective structures.

The high area associated with West Tathlina Lake No. 1 appears on the map but the majority of the records in that area gave little or no data.

No other Slave Point leads were indicated.

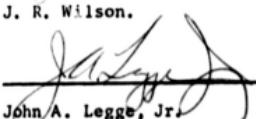
CONCLUSIONS:

The only promising Slave Point high indicated by the present shooting is marked by the abandoned West Tathlina Lake No. 1 test. Although minor reversals appear in the Slave Point horizon no other prospective areas can be seen.

Respectfully submitted,
J. A. LEGGE AND ASSOCIATES LTD.



J. R. Wilson.



John A. Legge, Jr.

November 30, 1967.

