

MAR 19680023: WINEFRED LAKE

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19680023

ECONOMIC MINERALS

FILE REPORT No. REPORT: WINEFRED LAKE SULPHUR PROSPECT
 Geological Investigation of Sulphur Permit No. 7

S-AF-007(1)INTRODUCTION

This report is made as a summary of the investigations carried out on behalf of Sulphur Permit No. 7 in the Winefred Lake area (Twp. 76, Rge. 1 W4M). The Sulphur Permit was acquired June 15, 1967 on the basis of a verbal report received at Jefferson Lake's offices concerning the presence of elemental sulphur in a core taken by Home Oil from the Winnipegosis (Keg River) formation at Home Winefred Lake 10-22 (Lsd. 10-22-76-1 W4M).

GEOLOGICAL MAPPING

The Winnipegosis formation was mapped over the area, Twps. 70-80, Rges. 1-15 W4M. A structure contour map of the formation's surface and an isopach map of the gross porosity in the upper or dolomite portion of the Winnipegosis were constructed. Cretaceous gas and heavy oil shows were also mapped.

LOG EVALUATION

A method for using sonic and electrical logs in determining the percent sulphur by volume was studied and applied. Results showed the presence of 22 feet of porous dolomite with greater than 10% sulphur by volume. These figures were later proven to be erroneous.

CORE and SAMPLE EXAMINATION

The well information obtained by Home Oil from their Winefred Lake operations was being held confidential until November 1967; therefore, the cores and samples on wells in the map area were examined for sulphur content. No sulphur was noted in any cuttings or cores.

FRASCH MINING

A wellsite in Texas where sulphur is produced was visited and various operations concerning exploitation and development of a Frasch process were studied. Many details were collected and later recorded in a report on Frasch Mining.

It was anticipated that an operation of similar nature might be required at Winefred Lake, thus all conversions to a cold weather operation were made.

HOME WINEFRED LAKE 10-22 CORE

On November 15th, 1967, Home Oil granted permission for the Winnipegosis core to be viewed. A description of the core is attached.

It appears that the original report concerning sulphur in the core was entirely exaggerated. The sulphur within the core was present at six separate places; five as material infilling fractures, one as partly infilling some leached vugular porosity. All observations were of a minimal nature - 0.06 feet of solid sulphur total within an 80 foot zone.

. 2

The sulphur cores examined at the Frasch mine wellsite had sulphur lining vugs that were present within a limestone host rock. A minimum of 5 feet of solid sulphur was considered to be the economic cut-off for an economic operation. The Winefred Lake core has vugs within a limestone host rock, but the sulphur apparently was introduced before the vugs were formed.


The Frasch core also showed the sulphur was the product of sulphate-reducing bacteria converting anhydrite to sulphur. The Winefred Lake core suggests that the sulphur dropped out of a sour gas that was once present in the rock.

The amount of sulphur present in this core is considerably less than that encountered at depth at many other locations in Alberta.

CONCLUSIONS

The regional study indicated that the Winnipegosis (Keg River) is sulphur-bearing at several locations (Minnaker and Sikanni wells in B.C.; Great Slave Lake, N.W.T.; Clearwater River, Alberta and Winefred Lake - of which the latter contains the least sulphur.)

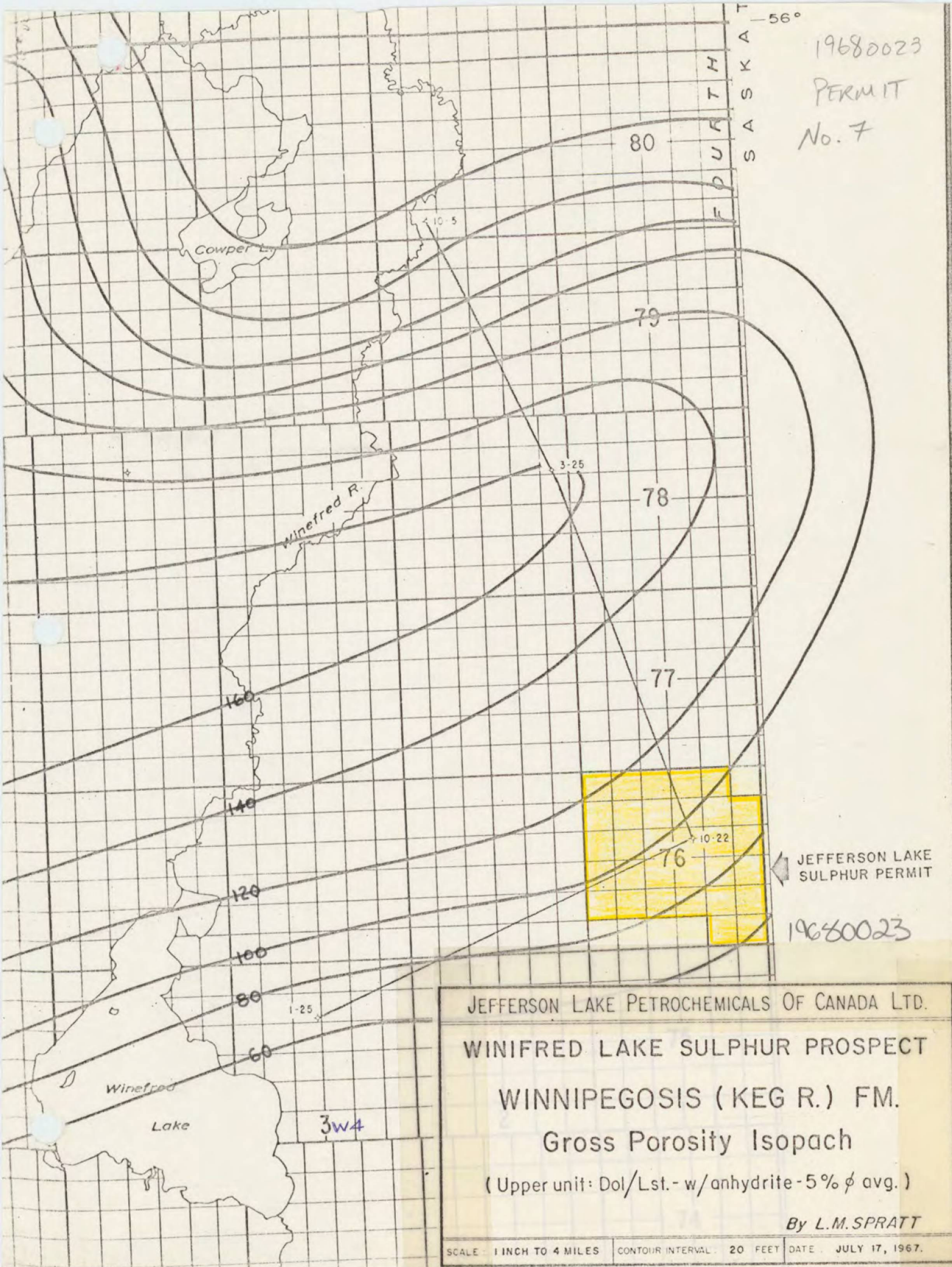
The data gathered is sufficient upon which to base the following conclusion: Due to the minimal quantity of sulphur present in the Home Winefred 10-22 core, further evaluation of Sulphur Permit No. 7 held by Jeff Lake, is totally unwarranted.



L. M. Spratt

LMS/lb

19680023
PERMIT
No. 7



JEFFERSON LAKE PETROCHEMICALS OF CANADA LTD.
WINIFRED LAKE SULPHUR PROSPECT
WINNIPEGOSIS (KEG R.) FM.
Gross Porosity Isopach
(Upper unit: Dol/Lst. - w/anhydrite - 5% φ avg.)
By L.M. SPRATT
SCALE : 1 INCH TO 4 MILES | CONTOUR INTERVAL : 20 FEET | DATE : JULY 17, 1967.

Core No. 1 - 1851-1878, Rec. 27 ft.

<u>Interval</u>	<u>Feet</u>	<u>Description</u>	(Sulphur content by volume) <u>EFSS</u>
1851-52	1	Limestone-micrite, tan dense	
-53	1	Limestone-micrite, tan & light brown with good vuggy porosity with a patch of <u>sulphur</u> ½" x ½"-orthorhombic, and a few scattered coarse <u>sulphur</u> crystals associated with calcite.	1% 0.01
-56	3	Dolomite - light grey, micrite, dense, a few stylolites present.	
-57	1	Dolomite - light grey, micrite, dense with a thin fracture plane containing finely crystalline <u>sulphur</u> .	1% 0.01
-58	1	Dolomite - light grey & brown, micrite, dense.	
-59	1	Dolomite - light grey & brown, micrite with very good fine vuggy porosity, partly infilled with coarse calcite crystals; <u>sulphur</u> lining a thin fracture with very fine crystals - very pale yellow.	1% 0.01
-78	19	Dolomite - light grey & brown, micrite, dense with few thin bands of good vuggy porosity; scattered calcite patches.	

Core No. 2 - 1878-1908, Rec. 30 ft.

1878-87	9	Dolomite - light grey & brown, micrite, dense.	
-88	1	Dolomite - light grey & brown, micrite, dense with a very thin vein of finely crystalline <u>sulphur</u> infilling a fracture.	1% 0.01
-1907	19	Dolomite - light brown, micrite, with good vuggy porosity scattered throughout.	
-08	1	Dolomite - light brown, micrite, dense with fair vuggy porosity, with a very thin vein of finely crystalline <u>sulphur</u> infilling a fracture, and medium grain <u>sulphur</u> crystals partly infilling a vug.	1% 0.01

Core No. 3 - 1908-1930, Rec. 18 ft.

1908-1916	8	Dolomite - light grey & brown, very finely crystalline with scattered vuggy porosity.	
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Core No. 3 (cont'd.)

-17	1	Dolomite - light grey & brown, very finely crystalline with very good vuggy porosity ($\frac{1}{2}$ " diameter) partly lined with calcite; one large sulphur patch.	1%	0.01
-26	9	Dolomite - light grey & brown, very finely crystalline with good vuggy porosity.		
-30		Missing core.		

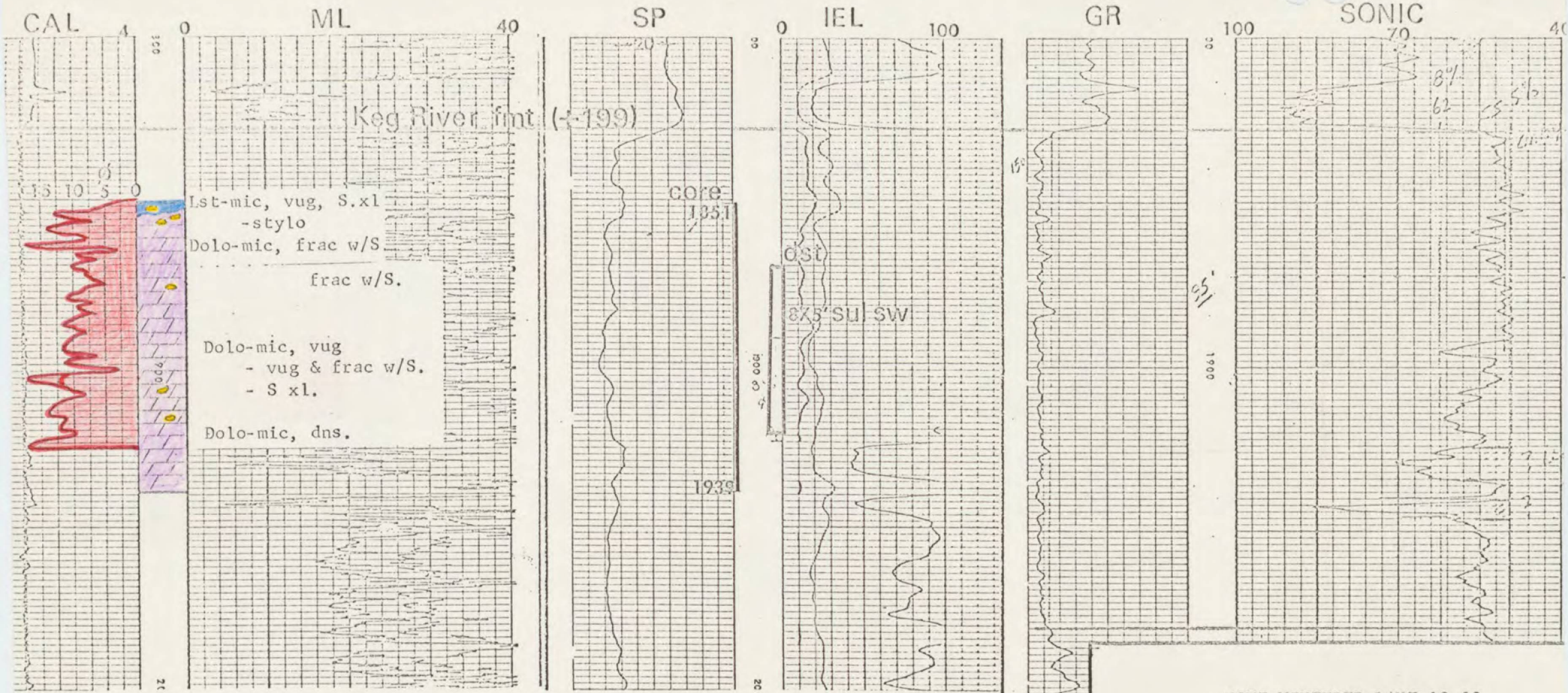
Core No. 4 - 1930-39, Rec. 9 ft.

1930-39	9	Dolomite - light grey & brown, micrite and very finely crystalline, dense.
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SUMMARY

- 80 foot interval with 0.06 feet of solid sulphur.
- 6 sulphur occurrences noted: 1853, 1857, 1859, 1878, 1908, 1917.
- Sulphur occurs here mainly as thin veins that were deposited in fine fractures.
- Sulphur does not fill or line vugs, appears to be unrelated vugular porosity.
- The conclusion drawn here is that sulphur was introduced after lithification and fracturing, and before dolomitization and development of vugular porosity (leaching of fossil material).

L. M. Spratt



HOME WINEFRED LAKE 10-22

Log section with Lithology
and
Porosity from core analyses

Nov. 1967

L. M. Spratt

19680023

10-22

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File No. 131590

SCHEDULE
to Sulphur Prospecting Permit No. 7

IN TOWNSHIP SEVENTY-SIX (76), RANGE ONE (1), WEST OF THE
FOURTH (4) MERIDIAN:

Sections One (1) and Two (2) and Sections
Seven (7) to Thirty-five (35) inclusive;

containing an area of Nineteen Thousand, Eight Hundred and
Forty (19,840) acres, more or less.

