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REPORT ON FIELD EXAMINATION
SULPHUR PROSPECTING PERMIT NO. 168
REDCLAY CREEK AREA, ALBERTA

Prepared For
Quintana Petroleum Corporation
December, 1968 19680135

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REPORT ON FIELD EXAMINATION

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J. C. SPROULE AND ASSOCIATES LTD.
OIL AND GAS ENGINEERING AND GEOLOGICAL CONSULTANTS

1009 FOURTH AVENUE S.W.
CALGARY — ALBERTA

TELEPHONE 269-7951

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The field work on these permits has been carried out at the request of Mr. Marvin Morris, acting for Quintana Petroleum Corporation. The work was authorized under our letter agreement of September 24, 1968, and the request made was that J. C. Sproule and Associates Ltd. should investigate and sample representative locations from selected areas. This work was described as Step 1 of Phase II in the program proposed in our letter of September 24. We quote as follows with reference to our proposal for field examination:

> "The field party conducting Phase II would, upon arrival in the field, immediately check those points of indicated interest that have become evident from the photogeological study. More specifically, we think that the preliminary study has pointed out those areas that are likely to contain sulphur. All areas where sulphur is likely to occur will be checked by the helicopter reconnaissance crew. Hand specimens and/or auger samples will be taken to determine the presence or absence of sulphur. We might call this preliminary part of the field program Step 1 of Phase II. The total cost of Step 1 would be $750 per permit-unit, or $2,250 for Permit No. 168, which totals approximately 60,000 acres."

The field work was conducted in September, 1968, by Mr. S. R. L. Harding and Mr. N. Soul, from a base field camp on the east side of the Athabasca River about six miles upstream from the mouth of the Firebag River. Use was made of a Bell G2 helicopter, contracted from Okanagan Helicopters Ltd., and a river boat with outboard motor. Fuel was placed in the area by barge.

The sample locations are shown on the accompanying Figure 1 and the related analyses by Chemical and Geological Laboratories Ltd. are presented as Appendix I. Field notes relating to the samples taken have been placed beside the analyses in the Appendix.

All areas indicated by the photogeological study to be prospective were examined in the field and representative samples taken. These areas yielded only traces of sulphur, except for Sample Location 168-8A, a small muskeg, at the south side of Area No. 4, from which a sample analyzed 3.51 percent sulphur, and even this is not a significantly high value. The material included muskeg debris, clay, and alluvium. These are normally rather high in sulphur in lake or depressional areas where sulphur is known. That being the case, it is reasonably certain that areas on the west side of the Athabasca River marked by the photogeological study do not contain occurrences of native sulphur in sufficient quantities to justify further exploratory activity. On the other hand, certain evidence observed on the east side of the Athabasca River may justify considering further exploration for that area.

Two sulphur springs were observed within Permit No. 168, in the Coffey Lake area, east of the Athabasca River, and additional sulphur springs were observed within one-quarter mile east of the Permit (Figure 1 and Plate I). These springs almost certainly emerge from Devonian carbonate rocks. Sample No. 168-7 from a sulphur spring yielded 18.23 percent sulphur on analysis. One auger hole in a swampy meadow yielded only traces of sulphur (Samples 168-1A and 1B). The whole Coffey Lake area between the escarpment to the southeast and the Athabasca River to the west is, however, quite low and generally poorly drained and sulphur accumulations could occur in this area.

It is recommended that the portion of Sulphur Prospecting Permit No. 168 indicated on Figure 1 and which includes the following sections totalling approximately 5,760 acres should be retained for further investigation:

Sections 28, 29, 32 and 33, Township 99, Range 9, W. 4 M.
Sections 3, 4, 9, 10 and 15, Township 100, Range 9, W. 4 M.

It is recommended that those portions of Sulphur Prospecting Permit No. 168 not listed in the preceding paragraph be abandoned by the Company and a request made for the return of any deposits for which the Company may be eligible.

We will be pleased to submit an estimate of the cost of conducting an adequate exploration sampling program over the areas recommended for retention at such time as a complete analysis of costs and performance of the past season's operations have been completed.

V. A. Farley

S. R. L. Harding, P. Geol.

1009 Fourth Avenue S. W.,
Calgary 2, Alberta.
December 19, 1968.
VAF/SRLH/fc

CHEMICAL & GEOLOGICAL LABORATORIES LTD.

14240 - 116 AVENUE, EDMONTON, ALBERTA

4605 - 12th. St. N. E., Calgary 67, Alberta.

APPENDIX

Date Received: October 24th., 1968 Laboratory Report Number: C68-4216-10

Kind of Sample: Soil Date Reported: November 5th., 1968

J. C. SPROULE & ASSOCIATES LTD.

SAMPLE NUMBER	ELEMENTAL SULPHUR (% by Weight on Dry Sample)	FIELD NOTES (By S. R. L. Harding)
168-1	Trace	Soil sample from spruce forest.
168-1A	Trace	Muskeg sample at 4 feet.
168-1B	Trace	Muskeg sample at 8 feet.
168-2	Trace	Soil sample from fir forest.
168-3	Trace	Soil sample on river bank.
168-4	Trace	Soil sample from swamp.
168-5	Trace	Mud near small creek mouth.
168-6-1	Trace	Glacial clay.
168-6-2	Trace	Deposit from seepage above clay.
168-7	18.23	Deposit at outlet of sulphur spring.
168-8A	3.51	Sample from grassy muskeg, depth 3 feet.
168-9A	Trace	Sample from grassy muskeg, depth $2\frac{1}{2}$ feet
168-10	Trace	Sample from grassy muskeg, depth 2 feet.
168-11	Trace	Sample from grassy muskeg, depth 3 feet.
169-12	Trace	Sample from old lake bed, depth 2 feet.
168-13	Trace	Soil sample from grassy meadow.

A. Sulphur spring at Sample Location 168-7, near the northeast end of Coffey Lake, on the east side of the Athabasca River. Mud sample taken near spring outlet in background of picture yielded 18.23% sulphur on analysis.

September 27, 1968

B. Aerial photograph showing two sulphur springs at base of escarpment on east side of the Athabasca River valley, less than one-quarter mile east of Permit No. 168 (see Figure 1).

September 27, 1968

Photos by S. R. L. Harding