

# MAR 19680029: WALDIN LAKE

Received date: Dec 31, 1968

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ECONOMIC MINERALS  
FILE REPORT No.  
*S-AE-012(2)*  
*1968002A*

REPORT ON FIELD WORK

OF CORE DRILLING

IN THE

WADLIN LAKE SULPHUR PROSPECT AREA

OF

ALBERTA, CANADA

FOR

HUSKY OIL CANADA LTD.

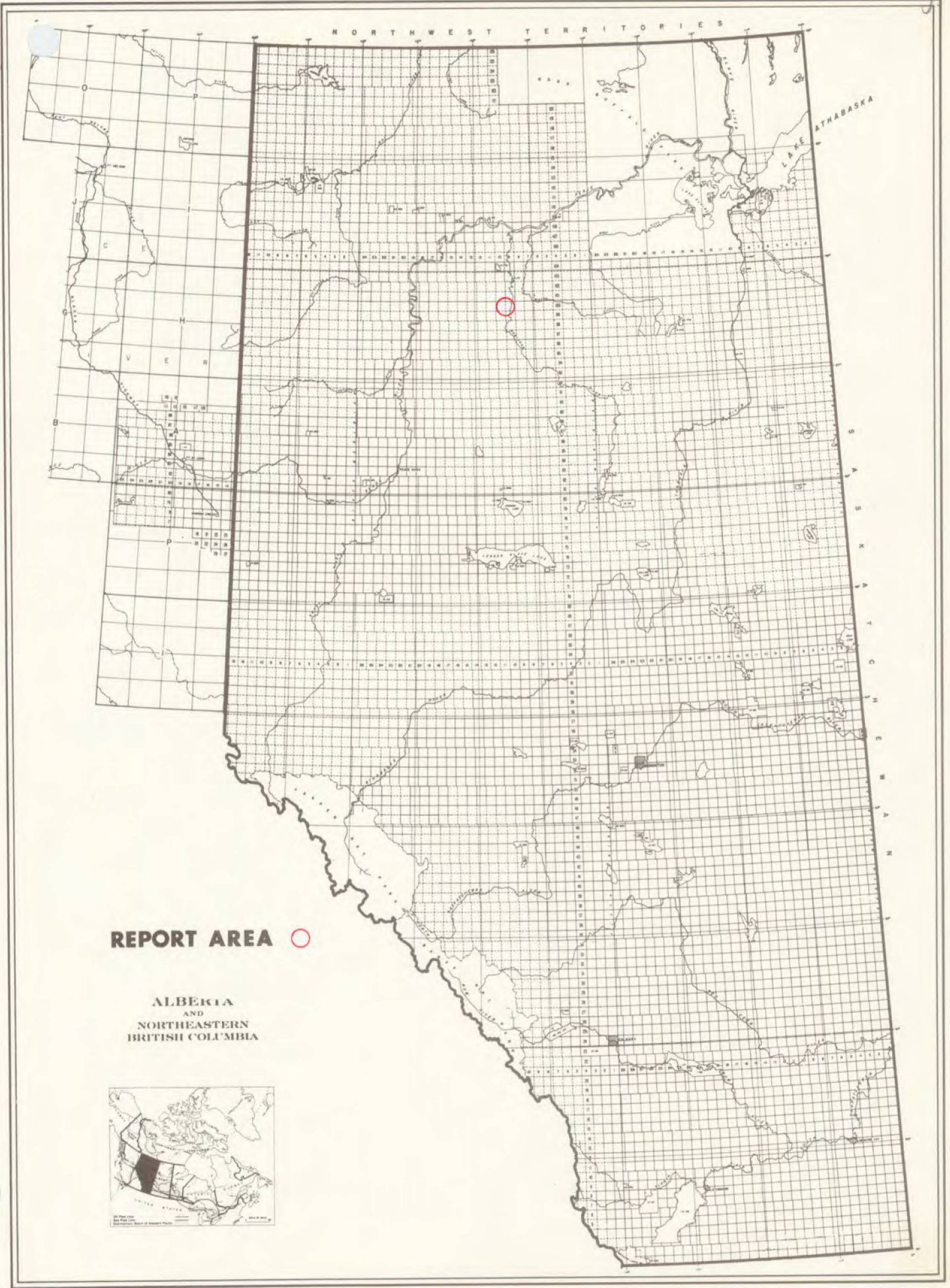
BY

SIGMA EXPLORATIONS LTD.

PROJECT NO. 12

Calgary, Alberta, Canada

October, 1968

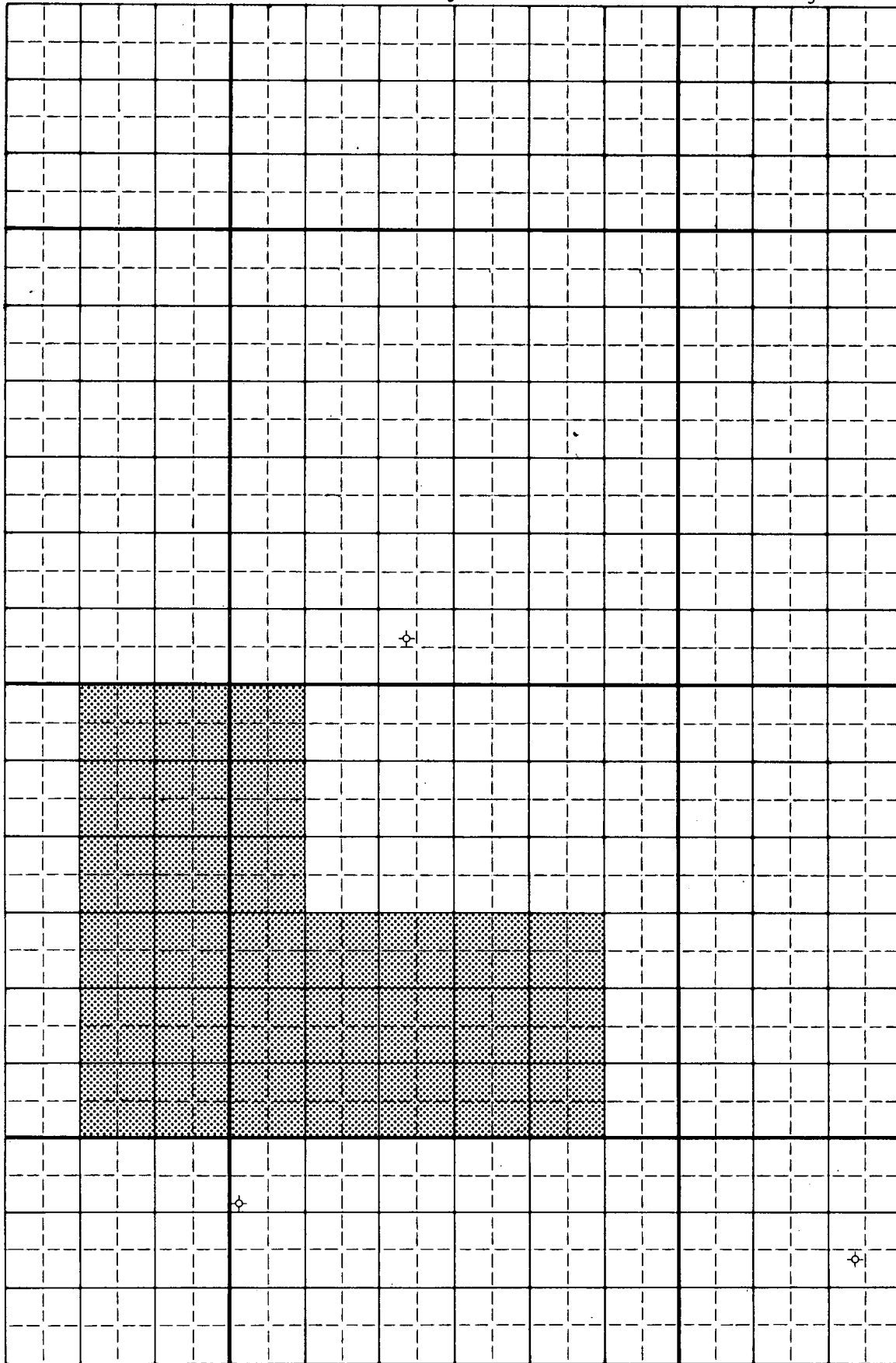






Rg. 10

Rg. 9

Rg. 8 W. 5 M.

19680029  
Tp. 102 Figure  
2



-  Sulphur Permit 12 (File 7918) Husky 100%
-  \_\_\_\_\_
-  \_\_\_\_\_
-  \_\_\_\_\_

WELLS ARE NOT SHOWN IN FIELD AREAS EXCEPT ON HUSKY INTEREST ACREAGE

<b>HUSKY OIL CANADA LTD.</b>	
WADLIN LAKE AREA - Alberta	
LAND:	WELLS:

INDEX

Page No.

1 - 2	LOCATION OF AREA
3 - 6	FIELD OPERATIONS
7	RESULTS & RECOMMENDATIONS
11 - 15	RESULTS OF ASSAYS

Map No.

1	BORE HOLE LOCATION & NUMBERS MAP
2	PRELIMINARY SULPHUR VALUES

LOCATION OF AREA

This sulphur permit is located in Northern Alberta, Twp. 100, Rge. 9 & 10, W.5M., approximately 50 miles S.SE. of the settlement of Fort Vermilion on the east flank of the Buffalo Head Hills.

Topography

Permit 12 is located immediately southeast of Wadlin Lake, with the western portion of the permit situated on a broad plateau on the top of the Buffalo Head Hills. To the east the permit area descends down the east flank of the Buffalo Head Hills and crosses the Wabasca River. Elevations across the permit vary from +2500 feet at the west boundary to +1400 feet on the eastern portion of the permit, and provided some 1100 feet of relief across the area. Extreme elevation changes occurred on the eastern flank of the Buffalo Head Hills where streams and creeks have eroded deeply into the flank of the feature, thus producing very sharply defined valley systems. The general drainage pattern is towards the east with all streams flowing out of the Buffalo Head Hills into the Wabasca River. Drainage on the eastern portion of the permit is poorly defined, but general westward into the Wabasca.

Forest cover throughout most of the prospect area graded from very light to medium with some heavy stands of spruce and poplar occurring near the main creeks and rivers.

The top of the Buffalo Head Hills is mainly a highland muskeg area with small tamarack and stunted swamp spruce trees predominating. Timber of commercial grade was encountered on the 26th base line and the eastern flank of the Buffalo Head Hills.

### Access

Access to the area was gained by a Forestry road which runs south southeast of Fort Vermilion through the Tall Cree Indian Reserve and crosses the Wabasca River north of the permit area. South of the Tall Cree Indian Reserve the Forestry access road to the Wadlin Lake Fire Tower was utilized to a point on the northern shore of Wadlin Lake. From here existing seismic lines were followed around the east end of the lake to the 26th Base Line.

An airstrip is located at the Wadlin Lake Forestry Tower, however heavy rains had made the airstrip unserviceable, and only during the last few days of the survey was it possible to land aircraft on the strip.

### Weather

The weather conditions encountered during the field operations were very favourable with clear skies and dry conditions existing throughout the entire period. Roads and trails were dry and dusty except where muskeg was encountered. These conditions aided in being able to supply the crew by means of four-wheeled drive vehicles from Fort Vermilion, but had somewhat adverse effect on the operation of the Nodwell tracked vehicle as this unit continually overheated while operating on the dry portions

of the Forestry road on the north flank of the Buffalo Head Hills.

Rain during June and July had severely eroded some portions of the forest access road from Tall Cree Indian Reserve to Wadlin Lake and thus it was not possible to travel this road with the power wagon. Thus the Nodwell vehicle was utilized in this area. Daytime temperatures averaged 65°F to 70°F, but due to the high elevation of the west end of the prospect, frost conditions were experienced by the crew during two nights that they were camped at Wadlin Lake.

#### FIELD OPERATIONS

Field operations were commenced on the permit area on August 15th and the drilling phase of the operations was concluded on August 20th, 1968. However a second trip was made into the area from August 23rd to 25th for the purpose of transporting two consulting geologists into the west portion of the permit.

One other exploration program was done by the crew and equipment east of permit number 12 and thus move and transportation charges of equipment was shared by two companies from Fort Vermilion to a point south of the Tall Cree Indian Reserve.

All line cutting was carried out by men using axes and power saws and the average line progress was approximately one-half mile per day per man. Some problems were encountered by the crew in completing line on the eastern flank of the



Buffalo Head Hills as the severe elevation changes and steep banks along the creek valleys made line cutting and drilling extremely difficult. Because of these conditions it was not possible to complete the portion of the line from shot point 12-3-27 eastward to the Wabasca River, a distance of some 12,000 feet. During the period of the survey a total of 7.8 miles of new line were cut and drilled and 6.0 miles of existing line were drilled. A total of 56 locations were drilled on five separate lines both east and west of the Wabasca River.

Geological samples were also taken along the banks of a stream near drill location 12-3-17 and considerable amount of work was done by both the crew, and later by consulting geologists, in this immediate area.

### Drilling

Drilling was carried out using two General Model GT30 powered hand augers and one conventional manual hand auger.

These drills were equipped with extra sectioned drill stem which made it possible to extend the holes down to maximum depth of 12 feet in many of the drill locations.

It was not possible to complete approximately 50% of the holes to a total depth of 12 feet because of the presence of permafrost under the moss in the higher elevations and gravel conditions which existed along the Wabasca River. Despite these difficulties at least one sample was obtained at all drill locations

representing soil conditions in these areas. Where permafrost or gravel was encountered samples were taken at four feet and at the bottom of the hole, in areas where it was possible to drill a full 12 foot section three samples were taken at the prescribed intervals of four feet.

### Sampling

Where two or more samples were taken in any drill hole these samples were averaged (batched) over the interval drilled for assay purposes. No problems were encountered in getting samples in any of the holes except where permafrost or gravel was encountered. Results of the assays, the majority of which were taken at 6 to 8 feet are contained in the back of this report. The balance of the sample material remains in its original bag and is stored for further studies.

### Plugging

Holes were plugged with wooden hole plugs after drilling to prevent accidents to the workmen while walking up and down the cut lines, or to any wild animals which may stray onto the drill locations later.

### Surveying

No vertical control was carried over the permit area, but horizontal control was maintained by chaining. A transit was used to turn off angles for the new cut lines and to check angles at intersections of existing lines. Control was established

from maps made from aerial surveys showing existing seismic cut lines or identifiable topographic features on the ground.

Bore hole locations were permanently marked by blazing trees a few feet from the cut line and marking the hole number with ink pens and metal tapes nailed to the blazed tree. Thus each of the hole locations can be easily re-established for future reference.

## RESULTS & RECOMMENDATIONS

The portion of the permit area which lies east of the Wabasca River show only slight traces of sulphur enrichment from the limited amount of shallow drilling done. It would appear that no area's of interest are present on any of the lines tested. However, the existing survey was very much of a reconnaissance nature, and it is suggested additional drilling would be warranted before completely condemning this area.

The west portion of the permit contained within the limits of Range 10, W.5M. does show certain areas of interest, and from the limited amount of work done to date would appear to warrant additional program during the coming winter months.

The first evidence noted that certain geological phenomena was present in Range 10, W.5M. was the occurrence of nodules of iron pyrite which were found in the clay bank near a stream located between Bore Holes 12-3-16 and 12-3-17. Samples of these concretions were collected by the crew and brought to Fort Vermilion when the drilling phase of the operation had been completed as far as possible.

Immediately upon the crews arrival, the Calgary office of Husky Oil Canada Ltd. were advised of this condition, and samples of the pyrite nodules were dispatched to Calgary by bus for examination and assay. Further to this it was requested that a

senior Geologist be sent from Calgary to give geological opinion on the significance of these concretions. Mr. W. J. Hennessey and Mr. George Wilson, consulting geologists, departed from Calgary the next day and arrived in Fort Vermilion approximately at the same time that the samples arrived in Calgary.

The field trip to the site was arranged by Sigma Explorations Ltd. and the necessary track vehicle, power wagon etc. were made available to transport men and equipment to Wadlin Lake immediately upon the arrival of the geologists. The actual site of the occurrence of these concretions was visited by Messrs. Hennessey, Wilson and Fowlie on August 24, 1968 and it is our understanding that the reports of the findings of Mr. Wilson and Mr. Hennessey have been submitted under separate cover to your office.

From information received in a letter from Mr. W. M. Morrison, Laboratory Manager for Chemical & Geological Laboratories Ltd., certain corrections must be made to four of the high sulphur values on Line number 3, namely Bore Holes 3-4, 3-7, 3-9 and 3-11. The reasoning behind these results are fully explained in Mr. Morrison's letter, a copy of which is enclosed at the back of this report.

It is interesting to note, however, that a reasonable high sulphur content was observed in Bore Hole 3-16, which point is relatively close to the creek bed where iron pyrite concretions

were found in August, and that this sulphur value appears to be valid. It is suggested that this area immediately around Bore Hole number 3-16 be further investigated for zones of sulphur enrichment during this winter period, when conventional drilling equipment can be mobilized in this area and the frozen muskeg will support trucks and bulldozers.

A suggested exploration program should include bore holes, and water sampling where possible, in a fan shaped program west, northwest and southwest of hole location 12-3-16. This would determine if areas of sulphur enrichment are present upstream from any location to the west of this point. A study of a topographic map will indicate all drainage radiates in a general westerly direction from Location 12-3-16.

Examination of samples and water studies of the water courses may also give additional information as to possible origin of the iron pyrite nodules originally located in the creek bank near Bore Hole 12-3-17.

This exploration program would require new lines to be cut with a small bulldozer on a recommended grid system radiating westward from Bore Hole 12-3-16. Holes would be drilled at regular intervals of approximately 250 feet and these holes should be drilled 5 feet into the consolidated clay found underlying the muskeg. A careful study should be made of the contact between the muskeg and the clay as it is postulated that a maximum concentration of elemental sulphur would be present

at this contact. Water samples should also be taken wherever possible on all tributaries and streams encountered, however, this might be somewhat difficult to do on some of the smaller streams because of the difficulty in locating them when they are frozen during the winter.

If such a program were carried out as outlined above it is considered probable that anomalies of high sulphur values may be delineated, and by study of the known geology and of the various water samples it is further considered probable that the sources of such elemental sulphur may be determined.

Respectfully submitted,

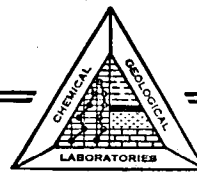


J. D. Fowlie, Supervisor

Approved



W. N. Rabey, P. Eng.



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

November 19th., 1968.

Sigma Explorations Ltd.,  
613 - 309 - 8th. Ave. S. W.,  
Calgary, Alberta.

Attention: Mr. J. Fowlie

Dear Sir:

Re: Correction on "12" series of Laboratory  
Report No. C68-4050.

We would draw your attention to the sulphur corrections that were marked with an asterisk on the original report submitted.

The exceptionally high results called for some research on the part of our laboratory, as we noted there was a lack of continuity in adjoining samples.


Further analyses on these four samples revealed that the percentages of sulphur originally determined included tremendous amounts of montan wax along with other vegetable waxes that no doubt originated in the moss and muskeg material.

By the time we had separated the waxes from the original sulphur determination, the sulphur content was in the 0.50% and lower range.

It did fool us, however, as the residue after extraction and evaporation of the solvent did leave an end product that was bright yellow in colour and enough sulphur crystals visible over same to give the impression that the residue was all sulphur. However, it appears the sulphur was just a minute layer on top of the waxes that had been extracted.

Thank you.

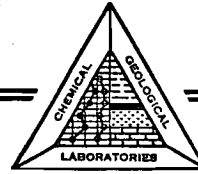
Yours sincerely,

  
W. M. Morrison,  
Laboratory Manager,  
Calgary Branch.



**CHEMICAL & GEOLOGICAL LABORATORIES LTD.**

1605 - 12th. Street, N. E., Calgary 67, Alberta

**SIGMA EXPLORATIONS LIMITED**

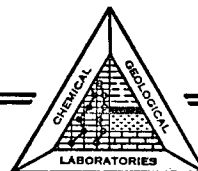
Kind of Samples: Soils

Lab. Report No.: C68-4050

Date Received: September 5th., 1968

Date Reported: September 18, 1968

<u>GRID SAMPLE</u>	<u>DEPTH</u>	<u>ELEMENTAL SULPHUR</u> (% by Wt. on dry Sample)	<u>GRID SAMPLE</u>	<u>DEPTH</u>	<u>ELEMENTAL SULPHUR</u> (% by Wt. on dry Sample)
12-2-1	4'	0.50	12-3-1	2'	Trace
12-2-2	8'	0.19	12-3-2	4'	Trace
12-2-3	8'	Trace	12-3-3	2'	0.13
12-2-4	12'	Trace	12-3-4	4'	70.96 *
12-2-5	12'	Trace	12-3-5	8'	Trace
12-2-6	MISSING		12-3-6	4'	Trace
12-2-7	8'	Trace	12-3-7	4'	32.18 *
12-2-8	12'	Trace	12-3-8	8'	Trace
12-2-9	12'	0.44	12-3-9	2'	52.92 *
12-2-10	12'	Trace	12-3-10	2'	Trace
12-2-11	8'	Trace	12-3-11	4'	25.04 *
12-2-12	4'	Trace	12-3-12	12'	Trace
12-2-13	8'	Trace	12-3-13	8'	Trace
			12-3-14	8'	Trace
			12-3-15	4'	Trace



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

SIGMA EXPLORATIONS LTD.

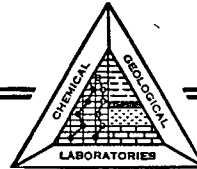
Kind of Samples: Soils

Lab. Report No.: C68-4050

Date Received: September 5, 1968

Date Reported: September 18, 1968

<u>GRID SAMPLE</u>	<u>DEPTH</u>	<u>ELEMENTAL SULPHUR (% by Wt. on dry Sample)</u>	<u>GRID SAMPLE</u>	<u>DEPTH</u>	<u>ELEMENTAL SULPHUR (% by Wt. on dry Sample)</u>
12-2-1	4'	0.50	12-3-1	2'	Trace
12-2-2	8'	0.19	12-3-2	4'	Trace
12-2-3	8'	Trace	12-3-3	2'	0.13
12-2-4	12'	Trace	12-3-4	4'	Trace
12-2-5	12'	Trace	12-3-5	8'	Trace
12-2-6	MISSING		12-3-6	4'	Trace
12-2-7	8'	Trace	12-3-7	4'	Trace
12-2-8	12'	Trace	12-3-8	8'	Trace
12-2-9	12'	0.44	12-3-9	2'	Trace
12-2-10	12'	Trace	12-3-10	2'	Trace
12-2-11	8'	Trace	12-3-11	4'	Trace
12-2-12	4'	Trace	12-3-12	12'	Trace
12-2-13	8'	Trace	12-3-13	8'	Trace
			12-3-14	8'	Trace
			12-3-15	4'	Trace



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

SIGMA EXPLORATIONS LTD.

Kind of Samples: Soils

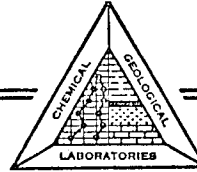
Lab. Report No.: C69-4050A

Date Received: September 5, 1969

Date Reported: September 18, 1969

<u>GRID SAMPLE</u>	<u>DEPTH</u>	<u>ELEMENTAL SULPHUR</u> <u>(% by Wt. on dry Sample)</u>
12-1-1	12'	0.15
12-1-2	12'	0.41
12-1-3	10'	Trace
12-1-4	12'	0.35
12-1-5	12'	Trace
12-1-6	12'	Trace
12-1-7	12'	Trace
12-1-8	12'	Trace
12-1-9	12'	Trace
12-1-10	12'	Trace
12-1-11	12'	Trace
12-1-12	12'	0.05
12-1-13	12'	Trace
12-1-14	12'	0.42
12-3-16	4'	6.63
12-3-17	12'	Trace
12-3-18	8'	Trace
12-3-19	12'	Trace
12-3-20	4'	Trace
12-3-21	4'	Trace
12-3-22	-	missing
12-3-23	8'	Trace
12-3-24	12'	Trace
12-3-25	8'	0.50
12-3-26	12'	Trace
12-3-27	8'	Trace

CHEMICAL & GEOLOGICAL LABORATORIES LTD.



14240-115 AVENUE, EDMONTON, ALBERTA

Date Reported: August 30, 1968

Laboratory Report Number: C68-3995

SIGMA EXPLORATIONS LTD.

Kind of Sample: Ore (Pyrite)

Date Received: August 23, 1968

GOLD CONTENT: < 0.006 oz./ton

SILVER CONTENT: 0.12 oz./ton

A scan revealed iron sulfide as the major component with trace quantities only of lead, manganese, calcium and barium.

Rge. 10

Rge. 9

W. 5 M.

WADLIN  
LAKE

WABASCA

RIVER

ROAD

Twp.  
100

12-2-1

12-2-13

12-3-1

12-3-17

12-3-25

12-3-27

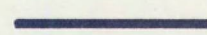
12-1-1

12-1-3

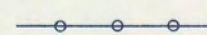
12-1-4

12-1-16

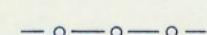
**LEGEND**



PERMIT OUTLINE



NEW LINE CUT & DRILLED



EXISTING LINE DRILLED



**SIGMA EXPLORATIONS LTD.**

309 8th Ave. S.W. Calgary, Alberta Phone 264-7865

**SULPHUR EXPLORATION PROGRAM**  
PERMIT No. 12 - Map No. 1

SCALE: 1" - 1 Mile

19680028

SEPT/1968

PG008371

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