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GEOPHYSICAL REPORT

ON THE

WHIP AND SAW GROUPS

WHIPSAW CK., 49° 120° S.W.

BY

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TEXAS GULF SULPHUR COMPANY

MAY 10, 1961 - JUNE 19, 1961

92H/7E+7W

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ILLUSTRATIONS (In Folder At Back)

INTRODUCTION

The Whip (20 claims) and Saw (8 claims) groups are about 16 miles southwest of Princeton. The two groups form a solid block (4 x 7) of claims on the north side of Whipsaw Creek, near its head.

In 1960, geological, geochemical and geophysical work was performed on the claims but provided insufficient data to proceed with drilling.

The geophysical method used in 1960 was Induced Polarization. In 1961, it was decided to use electromagnetic and magnetic methods on a much more detailed grid layout. The actual geophysical measurements were carried out by Mr. R.H. Clayton, senior geophysicist in the New York office of Texas Gulf Sulphur Company.

The writer, who located the claims in 1959, was again responsible for programming and organization of the assessment work which was undertaken between May 10th and June 19th, 1961.

GRID LAYOUT

Picket lines were driven at 200 foot intervals from a baseline oriented 332° true north (referred to below as north). These lines extended 2,000 feet on either side of the baseline. Stations were at 100 foot intervals numbered from 0 to 40 W, with the baseline at 20 W. Main picket lines were Z, A, B, C, D, E and F at 1,000 foot intervals. Intervening picket lines at 200 foot intervals were numbered Z-2N, Z-4N, etc. There were no picket lines between C and D.

METHODS USED

The whole grid was surveyed using the McPhar Intermediate Range Electromagnetic Unit (I.R.E.M.), employing the set-up method. This unit is a vertical loop electromagnetic unit which measures the distortion of a primary horizontal alternating magnetic field in terms of the angle which the resultant field makes with the horizontal along a line at right-angles to the line joining receiver and transmitter.

The set-up method involves setting up the transmitter at a central point and re-orienting the transmitting coil to each successive receiver station. Two receivers can be used at a time, symmetrically stationed on opposite sides of the receiver.

Picket lines between 200 and 1,000 feet from the transmitter location can be surveyed. Generally lines 400,

600, and 800 feet away are surveyed from each set-up. At these spreads, a massive sulphide body could be detected at depths of 200, 300 and 400 feet respectively, as a rough estimate. This is greater penetration than any other unit available would permit, so the plan was to survey the whole area with I.R.E.M. set-ups and to cover any anomalous areas with other methods.

One alternative was to use the I.R.E.M. by the broadside method. This involves moving the transmitter for each receiver station. A conductor can often be located more accurately by this method and depth estimates are more easily made. Broadside surveys at spreads of 400 feet and 200 feet were made over areas of interest.

A second apparatus available was a McPhar Horizontal Coil Electromagnetic Unit (HEM). The transmitter is a horizontal coil emitting a vertical alternating magnetic field. The receiver is a similar coil 200 feet away. The signal at the receiver is compared in amplitude and phase with the transmitter signal by means of a connecting reference. With the spread fixed at 200 feet, the depth penetration is of the order of 100 feet only. The H.E.M. was used only in areas where the I.R.E.M. indicated the possibility of a conductor at a depth of 100 feet or less.

A magnetic survey of most of the area was carried out using a Ruska magnetometer of the Schmit type.

ORIENTATION ERRORS

Relief was considerable and the picket lines were unusually long so that orientation errors were considerable when using the I.R.E.M. This was especially so between lines D and F.

Anomaly 1 is definitely too large to be caused by orientation errors and the ratios of high to low frequency response on Anomalies 2 and 3 are so high as to indicate that they are genuine anomalies (an orientation error would affect both frequencies equally). Anomalies 4 and 5 are indicated by the nature of the null rather than by dip-angles (minima rather than sharp nulls).

The only area where orientation errors may have obscured an anomaly is on lines E-8N and F between 20 W and 30 W. The results have a one-way trend typical of a systematic orientation error but there is considerable difference between high and low frequency. Furthermore, there were two minor I.P. anomalies indicated in the McPhar survey on line F.

RESULTS

1. An I.R.E.M. anomaly at about 24 W stretched from Z to C. The anomaly was significantly large from Z - 6N to B - 2N, a distance of 1,600 feet.

A magnetic anomaly of the order of 400 gammas coincides with the E.M. anomaly.

On line A the anomaly coincides with the I.P. anomaly shown in the 1960 survey by McPhar. It partly coincides with the I.P. anomaly on line B, but is quite separate from the smaller I.P. anomaly on line C.

Broadside I.R.E.M. gave a minimum response at a 200 foot spread and a small crossover at a 400 foot spread on line A and A-2N.

The H.E.M. response was minimal at best.

2. A magnetic high of about 600 gammas coincides with a small I.R.E.M. set-up crossover at A-6N 35W. There was no broadside response and the H.E.M. response was minimal. The anomaly was separated by a magnetic low of 500 gammas from another lesser high of 250 gammas.

3. A small I.R.E.M. set-up crossover coincides with a previous I.P. anomaly at C 35 W. There is an indication of a high-frequency I.R.E.M. broadside anomaly at a 400 foot spread, but this is largely invalidated by orientation errors.

There is a minor H.E.M. anomaly.

4. Very minor I.R.E.M. set-up anomalies centering B-2N 15W are corroborated by a small magnetic anomaly (200 gammas) as far as the magnetic survey extends but there is no H.E.M. anomaly.

5. Minor I.R.E.M. set-up anomalies on D2N and D4N, 35W could be orientation errors but they coincide with an irregular H.E.M. anomaly.

INTERPRETATION

The ratio of response at high and low frequencies, about 3 to 1 on average, indicates a disseminated sulphide body which might be as high as 50% sulphide in granular form or as low as 10% in continuous stringers. The nature of the presumed bedrock (rhyolite porphyry) seems to make a granular form more likely. It is assumed from geological indications that graphitic zones are probably not present.

Over a zone reaching from Z to C between 20 and 30W, from Z-8N to B-2N between 10 and 20W and from A-6N to 3 between 30 and 40W minor crossovers occur at the stations opposite the transmitter set-up. This is taken to indicate that there is some mineralization all over this area with a general N-S trend and that the transmitter energizes the ground in the immediate vicinity sufficiently to cause a small crossover at the receiver. This mineralization probably commences at the sub-surface, although leaching may occur. The larger cross-overs in Anomaly 1 centering on line A, 24W probably indicate larger concentrations of sulphides. They appear to be quite deep, probably at least 120 feet on line A and as much as 200 feet on other lines.

The magnetic anomaly on Anomaly 1 indicates a maximum depth of 100 feet. The higher elevation of this anomaly may be caused by float in the overburden or by preferential leaching of sulphides compared with the magnetite in the upper part of the mineralized zone.

The magnetic highs of Anomaly 2 are probably caused by magnetite in skarn zones at the contact of a limestone xenolith with the Eagle granodiorite. The low may be a dipole effect or represent unaltered limestone.

Anomaly 3 is doubtful. It appears to be deep and dipping towards the west. Anomaly 4 is even more doubtful. It appears to have an easterly dip. Anomaly 5 is very doubtful because of the topography in this area.

STATEMENT OF COSTS

Grid Layout

D. A. Lowrie, M.A.Sc.	14 dys.	@ $700./mo.	316.13	
P. B. Read, M.A.Sc.	7 "	@ $550./mo.	128.33	
S. G. Turner, B.A.	24 "	@ $425./mo.	329.03	
D. G. McRae, Geol. Student	34 "	@ $300./mo.	332.90	
P. E. Crone, " "	34 "	@ $275./mo.	305.16	
A. Marr, " "	34 "	@ $275./mo.	305.16	
M. Schau, " "	34 "	@ $275./mo.	305.16	2,021.87

Geophysical Work

R. H. Clayton, M.A.	15 dys.	@ $650./mo.	325.00	
P. B. Read, M.A.Sc.	12 "	@ $550./mo.	220.00	
S. G. Turner, B.A.	19 "	@ $425./mo.	269.16	
D. G. McRae, Geol. Student	7 "	@ $300./mo.	70.00	
P. E. Crone, " "	7 "	@ $275./mo.	64.16	
A. Marr, " "	7 "	@ $275./mo.	64.16	
M. Schau, " "	7 "	@ $275./mo.	64.16	1,076.64

Supervision and Organization

W. R. Bacon, P.Eng.	4 dys.	@ $35.00 dy.	140.00

$ 3,238.51

Total Costs, Whip Group $ 2,159.01

Total Costs, Saw Group $ 1,079.50

July 14, 1961

W. R. Bacon

40W 30W 20W 10W 0

F

E 8 — AXE Nº 4 — AXE Nº 3 — PICK Nº 4

E 6

E 4

E 2

E

D 8 — AXE Nº 2 — AXE Nº 1 — PICK Nº 2

D 6

D 4

D 2

D

WHIP GROUP

WHIP Nº 8 — WHIP Nº 7 — SAW Nº 8

C

B 8

B 6

B 4

B 2

B

A 8 — WHIP Nº 6 — WHIP Nº 5 — SAW Nº 6

A 6

A 4

A 2

A

SAW GROUP

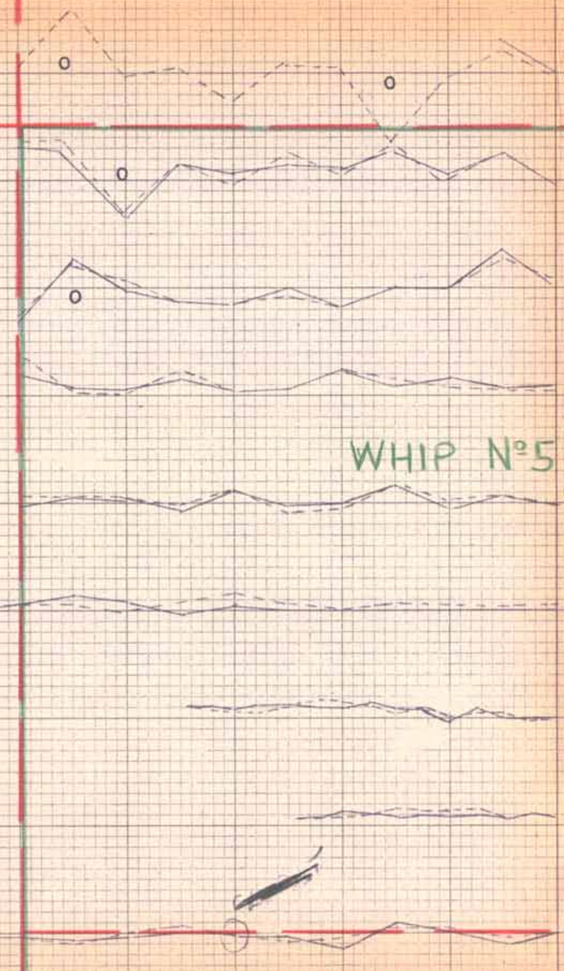
Z 8

Z 6

Z 4 — WHIP Nº 4 — WHIP Nº 3 — SAW Nº 4

Z 2

Z



LEGEND

DIP ANGLES — 400 CPS
2,000 CPS

PROBABLE ORIENTATION ERRORS 0

322°

N

TEXAS GULF SULPHUR COMPANY
WHIP AND SAW CLAIM GROUPS
SIMILKAMEEN MINING DIVISION, B.C.

VERTICAL LOOP ELECTROMAGNETIC SURVEY

BROADSIDE METHOD 200 FEET SPREAD

SCALES LINEAR 200 FEET = 1 INCH
DIP-ANGLES 20° = 1 INCH

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40W 30W 20W 10W 0

F
E 8
E 6
E 4
E 2
E
D 8
D 6
D 4
D 2
D
C
B 8
B 6
B 4
B 2
B
A 8
A 6
A 4
A 2
A
Z 8
Z 6
Z 4
Z 2
Z

AXE Nº 4 | AXE Nº 3 | PICK Nº 4

AXE Nº 2 | AXE Nº 1 | PICK Nº 2

WHIP Nº 8 | WHIP Nº 7 | SAW Nº 8

WHIP GROUP

WHIP Nº 6

WHIP Nº 5

SAW Nº 6

SAW GROUP

WHIP Nº 4

WHIP Nº 3

SAW Nº 4

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LEGEND

DIP-ANGLES 400 CPS
2,000 CPS

PROBABLE ORIENTATION ERRORS 0

322°

N

TEXAS GULF SULPHUR COMPANY
WHIP AND SAW CLAIM GROUPS
SIMILKAMEEN MINING DIVISION, B. C.

VERTICAL LOOP ELECTROMAGNETIC SURVEY

BROADSIDE METHOD 400 FEET SPREAD

SCALES LINEAR 200 FEET = 1 INCH
DIP-ANGLES 20° = 1 INCH

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No. 3

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40W 30W 20W 10W 0

F

E8 E6 E4 E2 E D8 D6 D4 D2 D B8 B6 B4 B2 B A8 A6 A4 A2 A Z8 Z6 Z4 Z2 Z

AXE Nº 4 | AXE Nº 3 | PICK Nº 4

AXE Nº 2 | AXE Nº 1 | PICK Nº 2

WHIP Nº 8 | WHIP Nº 7 | SAW Nº 8

WHIP Nº 6 | WHIP Nº 5 | SAW Nº 6

WHIP Nº 4 | WHIP Nº 3 | SAW Nº 4

WHIP GROUP

SAW GROUP

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LEGEND

400 CPS IN PHASE
OUT OF PHASE
1,600 CPS IN PHASE
OUT OF PHASE

322°

N

10W

TEXAS GULF SULPHUR COMPANY
WHIP AND SAW CLAIM GROUPS
SIMILKAMEEN MINING DIVISION, B.C.

HORIZONTAL LOOP ELECTROMAGNETIC SURVEY

SCALES 200 FEET = 1 INCH
60% = 1 INCH

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STANDARD K+E

AXE No. 2

AXE No. 1

PICK No. 2

WHIP No. 8

WHIP No. 7

SAW No. 8

WHIP GROUP

WHIP No. 6

ANOMALY 2

WHIP No. 5

(MAIN) ANOMALY 1

SAW No. 6

SAW GROUP

WHIP No. 4

WHIP No. 3

SAW No. 4

No. 1

40W

30W

20W

10W

322°

NA

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No. 5

36 52

TEXAS GULF SULPHUR COMPANY

WHIP & SAW CLAIM GROUPS
SIMILKAMEEN MINING DIVISION B.C.

MAGNETIC CONTOURS, VERTICAL INTENSITY

CONTOUR INTERVAL — 100 γ

SCALE: 1" = 200'

W.J.S.

JUNE '62