



COMBINED GEOLOGICAL, GEOPHYSICAL & GEOCHEMICAL REPORT

ON THE **090912**

J.T. & H.L. CLAIM GROUPS

KENO HILL AREA

FOR

HACIENDA OIL AND MINERALS LTD.



October 6, 1981

W. G. TIMMINS EXPLORATION & DEVELOPMENT LTD.

**090912**



00000

This report has been prepared by  
the Geological Survey of Canada  
under Section 53 of the Quartz  
Mining Act and is valued as  
represented on the amount  
of \$ 2,000

*Watson*

for Regional Manager, Exploration and  
Geological Services for Commissioner  
of Yukon Territory.

00000

## TABLE OF CONTENTS

	PAGE NO.
SUMMARY	
Introduction	1
Property	1
Location & Access	2
Topography, Timber & Climate	2
Location Map	3
History	4
Regional Geology	6
Claim Map	7
Geology of the Property	8
Mineralization	9
Instrumentation & Theory	
VLF-EM	10
Ground Geophysical Procedure	12
Magnetometer	12
Geochemical Survey Procedure	13
Geochemical Test Procedure	13
Geochemical Interpretation	14
Geophysical VLF-EM Interpretation	14
Conclusions & Recommendations	15
Estimated Costs of Programme	18
Certificate - Brian J. Wing	19
- W. G. Timmins	20
References	21
APPENDIX I	Results of Magnetic Survey
	Interpretation of Magnetic Data
	Results of VLF-EM Survey
	Results of Radiometric Survey
	Statement of Costs
APPENDIX II	Analytical Report
MAP AT REAR:	J. T. Claim Group, Geology & VLF-EM Survey

**W. G. TIMMINS EXPLORATION & DEVELOPMENT LTD.**

**CONSULTING GEOLOGISTS**

## SUMMARY

The J.T. and H.L. claim group consists of eighty-eight mineral claims about 16 km. north of Elsa, in the Galena Hill-Keno Hill area, Yukon Territory.

The property is underlain by graphitic phyllites and phyllitic quartzites intruded by "greenstone" bodies.

Airborne magnetometer and VLF-EM surveys conducted in September, 1979 have revealed several EM conductors. These were primary targets of the ground survey done in July, 1981. The ground survey defined at least two linear EM conductors that extend for a considerable distance over the property. These conductors cannot be explained completely with existing knowledge and warrant further investigation since geochemical anomalies are associated with them.

INTRUDUCTION

The claim group consists of eighty-eight mineral claims on the west side of Forbes Hill in the Hanson Lake area, Yukon Territory.

An airborne VLF-EM, magnetometer and scintillometer survey was carried out by Columbia Geophysical Services Ltd. during September, 1979. (Appendix I) A follow up ground VLF-EM survey, with accompanying geology and geochemistry was conducted in July, 1981. This report summarizes the geology, geochemical and VLF-EM results using the Fraser Filter method.

PROPERTY

The property consists of eighty-eight mineral claims known as the J.T. and H.L. 1 - 32 groups. The claims and their record numbers are listed as follows.

<u>CLAIM NAME(S)</u>	<u>RECORD NO(S)</u>
J.T. 1 - 6	YA40539-YA40544 inc.
J.T. 7 - 12	YA40056-YA40091 inc.
J.T. 13 - 16	YA40906-YA40909 inc.
J.T. 17 - 40	YA40862-YA40885 inc.
J.T. 47 - 48	YA41390-YA41391 inc.
J.T. 49 - 56	YA41344-YA41351 inc.
H.L. 1 - 32	YA43492-YA43523 inc.

**W. G. TIMMINS EXPLORATION & DEVELOPMENT LTD.**

**CONSULTING GEOLOGISTS**

## LOCATION & ACCESS

Approx. Co-ordinates:  $64^{\circ} 02'$  N. Lat.  $135^{\circ} 19'$  W. Long.

The property is located in the Mayo Mining Division, claim sheet 106-D/3, at Hanson Lake, about 10 miles northeast of Elsa, Yukon Territory.

A gravel road from Elsa provides access to the claims. Good gravel roads connect Elsa and Mayo, some 30 miles to the south with the highway to Whitehorse.

Mayo is also serviced by Northland Airlines scheduled flights from Dawson and Whitehorse.

## TOPOGRAPHY, TIMBER & CLIMATE

The claims are situated along the western flank of Forbes Hill with elevation ranging from 2500' A.S.L. to 3000' A.S.L. Peaks in the general area rise to 4800' A.S.L.

The region is well vegetated with spruce and willows, along with some poplar, birch and alder. Timberline is about 4000' elevation.

The area lies within the Yukon Plateau and is characterized by an undulating surface with broad smooth uplands. The main drainage occurs in wide U-shaped valleys, modified by glaciation.

Several creeks provide water in proximity to the claims and McQuesten, Hanson and Ladue Lakes are present in the valley bottom.

Much of the area is subject to perma-frost conditions.



H.L. + J.T. CLAIM GROUP  
 KENO HILL AREA  
 YUKON TERRITORY  
 LOCATION MAP

While the year round climate is best described as rigorous the nearly continuous daylight during the short, warm summer provides an excellent environment for mineral exploration activities. Rainfall is moderate.

## HISTORY

Early work prior to 1922 (Cockfield) consisting of underground exploration and trenching was carried out on showings at the Rambler Hill property, the Stand-to property and the Mount Cameron property.

Bulldozer trenching was carried out on the Rambler Hill property in 1961 and on the Stand-to property in 1966.

During 1964, the Geological Survey of Canada carried out a reconnaissance stream and spring sediment, surface and ground water, heavy mineral, and rock geochemical survey over some 1900 square miles in the Keno Hill area.

During the period between June and September of 1968, Silver Spring Mines Ltd. conducted a programme of exploration work on the Silver-Spring claims groups. The Silver and Spring claim groups consisted of 38 full size claims and two fractional claims, now completely covered by the present J.T. claims. The field operations were managed by J. Strebchuk, under supervision of P. H. Sevensma, Consulting Engineer from Vancouver, B. C.

**W. G. TIMMINS EXPLORATION & DEVELOPMENT LTD.**

**CONSULTING GEOLOGISTS**

Their program consisted of preliminary geochemical soil sampling, geological mapping, and 14,300 feet of Ronka EM 16 electromagnetic survey. One deep trench was made with a D8H bulldozer, exposing approximately 100 feet of underlying rust stained phyllitic shale. The bedrock is striking approximately east-west and dipping at 20-35 degrees to the south. Several other "bulldozer roads and cuts" were made on the west face of Forbes Hill towards Hanson Lake.

Silver Spring reports "favourable geology and positive geochemical results" and numerous minor conductors that were located geophysically. Follow up of these results 'up slope and to the north' was recommended, though not carried out.

In 1971, Canada Reserve Oil and Gas Limited carried out a geophysical programme on the Silver and Spring claim group under the supervision of R. W. Stemp, P. Eng. This survey located several conductors and although graphitic horizons in the phyllite were believed to be the causative source, a few anomalies were not explained. They recommended further investigation of all conductors, however no additional work has been reported.

Considerable staking activity has taken place in the area within the last three years, with approximately a thousand claims being recorded from the western portion of Hanson Lake past Potato Hills and Haggard Dome, as far as Secret

**W. G. TIMMINS EXPLORATION & DEVELOPMENT LTD.**

**CONSULTING GEOLOGISTS**

Creek some 20 miles to the west.

## REGIONAL GEOLOGY

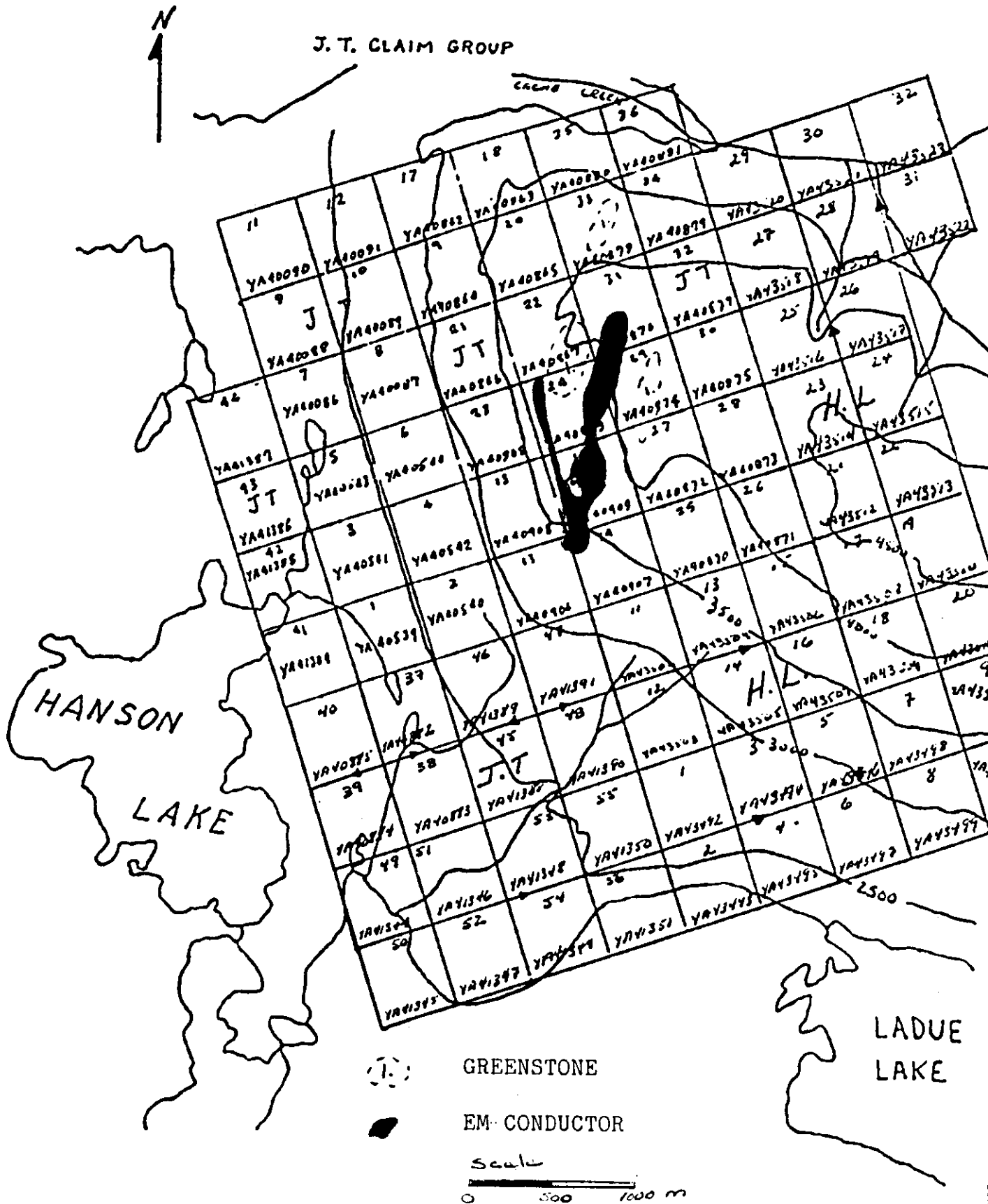
The area is underlain by sedimentary rocks of the Yukon Group, probably of Precambrian or Paleozoic age. A few geologists consider some units to be Jurassic. The sediments consist of graphitic and sericite schists, phyllites, quartzites, argillites and a few limestone lenses.

Conformable lenses and sills of greenstone occur in the schist and quartzite formations and some quartz-feldspar porphyry sills are present locally in all types of rocks.

Granitic stocks of Mesozoic age occur west of Hanson Lakes.

There are two principal fault systems; a northeast trending system of vein faults with numerous subsidiaries containing the ore bodies of the Keno Hill area and a north-northeast to northwest trending series which cut the ore zones and are usually barren.

# HACIENDA OIL AND MINERALS - Claim Map FROM SHEET 106D-3



## GEOLOGY OF THE PROPERTY

The property is underlain by the lower Schist Division of graphitic phyllite and dark grey to grey thinly bedded phyllitic quartzites or siltstones of Jurassic age. These are exposed throughout the property though many occurrences have been frost heaved thus preventing accurate structural measurements. Due to the low resistance to weathering and transport processes characteristic of this rock type the frost altered occurrences are considered to be nearly in place. Where structural measurements are obtainable, the rocks are striking west to northwest and dipping to the south at about 30-40<sup>0</sup>.

The sediments are intruded by numerous sills, plugs and lens-like bodies of metagabbro and metadiorite now altered to greenstone. The intrusives are more common on the upward slopes of the Forbes Hill and very prevalent in talus and scree slopes. The intrusives contain feldspar laths commonly and are occasionally porphyritic with respect to feldspar. Hornblende needles are present, though not common. The greenstones range from very slightly magnetic in the western sector to highly magnetic in the eastern sector, and it is believed that they account for the 'highs' mapped by the airborne magnetometer survey.

Sparse disseminated pyrite and chalcopyrite occur locally in the greenstones.

**W. G. TIMMINS EXPLORATION & DEVELOPMENT LTD.**

**CONSULTING GEOLOGISTS**

Glacial deposits, mainly till, glacial-fluvial and glacial-lacustrine gravel, sand and silt cover the lower slopes of Forbes Hill and extend to the Hanson Lakes to the west. They range from a metre or less to several metres in depth, and extend up slope to an elevation of 1,100 metres (3500').

### MINERALIZATION

Mineralization on the nearby Rambler Hill, Stand-to Hill and Mount Cameron properties occurs as limonite, galena, pyrite, quartz siderite, sphalerite and chalcopryrite in north and northeast trending faults or shears.

On the Bear #5 claim to the north across Cache Creek on Rambler Hill there is a small showing of galena, tetrahedrite and freibergite, quartz-siderite, chalcopryrite, azurite and malachite, contained in a northeast trending quartz intrusion in the phyllitic rocks.

On the J.T. & H.L. claim groups the only mineralization observed is contained as tetrahedrite in a small quartz vein approximately one metre wide and striking to the north-northwest. The structure occurs on the north side of a talus slope but appears to be nearly in place though the length could not be estimated. A bulldozer D7H attempted to trench down from the top of the hill but could not reach the quartz structure.

No other mineralization was observed on the J.T. and H.L. claims.

Several areas of gossan and iron stain were bulldozed however revealed no mineralization of interest.

A large area of boulders down slope to the west of Forbes Hill is heavily iron stained and is responsible for Silver Springs entering the area in the late sixties. Although they did not find the source of the iron it may well be further up the hill, as their work was confined to the lower area of the J.T. and H.L. claims.

#### INSTRUMENTATION & THEORY

##### - VLF-EM

The instrument used was a VLF-EM receiver, Model 27, manufactured by Sabre Electronic Instruments Ltd. of Burnaby, B. C. This instrument is designed to measure the electromagnetic component of the very low frequency field (VLF) transmitted, for this area, at 18.6 KHz, from Seattle, Washington.

In all electromagnetic prospecting, a transmitter produces an alternating magnetic field (primary) by a strong alternating current usually through a coil of wire. If a conductive mass such as a sulphide body is within this magnetic field, a secondary alternating current is induced within

**W. G. TIMMINS EXPLORATION & DEVELOPMENT LTD.**

**CONSULTING GEOLOGISTS**

it which in turn induces a secondary magnetic field that distorts the primary magnetic field. It is this distortion that the EM receiver measures. The VLF-EM uses a frequency range from 16 to 24 KHz, whereas most EM instruments use frequencies ranging from a few hundred to a few thousand Hz. Because of its relatively high frequency, the VLF-EM can pick up bodies of much lower conductivity and therefore is more susceptible to claybeds, electrolyte-filled fault or shear zones and porous horizons, graphite, carbonaceous sediments, lithological contacts as well as sulphide bodies of too low a conductivity for other EM methods to pick up. Consequently, the VLF-EM has additional uses in mapping structure and in picking up sulphide bodies of too low a conductivity for conventional EM methods and too small for induced polarization. (In places it can be used instead of I.P.). However, its susceptibility to lower conductive bodies results in a number of anomalies, many of them difficult to explain.

VLF-EM surveys offer the advantages of being inexpensive and rapid but are subject to a number of limitations. Firstly conductive overburden or host rocks severely limit the depth of exploration. Secondly, anomalies tend to be generated by conductivity changes in the overburden or at the overburden/bedrock interface. Thirdly, since the frequency is high, the response factor of many geological conductors, including orebodies, is above the range where appreciable quadrature effects are generated. Phase shifts

are more usually associated with effects of conductive ground. An additional problem in the Keno Hill area is that the strongest primary VLF signal, Seattle, Washington, couples very poorly with the northeast and north trending vein deposits. The signal from Hawaii which would couple excellently is, unfortunately, too weak to be used for reliable measurements.

#### GROUND GEOPHYSICAL PROCEDURE

Control for measurements was obtained by running chain and compass traverse lines from a base line at 100 metre intervals with stations at 30 or 40 metres. The base line was positioned on an azimuth of  $160^{\circ}$  along the cut line between claims J.T. 17 & 18 respectively and extends for 2600 metres. Cross lines were run at  $70^{\circ}$  for 1000 metres in length.

#### MAGNETOMETER

No ground magnetometer survey was done due to the extended length of time needed for closure and magnetic storm conditions. Many loops took well into five hours due to the terrain.

GEOCHEMICAL SURVEY PROCEDURE

Soil samples were taken at every grid station that was possible to sample. Some difficulty with perma-frost was encountered which resulted in some mixing of organic material in many of the samples. A total of 250 samples were collected and shipped to Terramin Research Laboratories, Calgary, Alberta for geochemical analysis.

GEOCHEMICAL TEST PROCEDURE

All samples were tested by Terramin Research Laboratories. The soil samples are first thoroughly dried then sifted through a -80 mesh screen. A measured amount of the sifted material is then put into a test tube with subsequent measured additions of nitric-perchloric. This mixture is next diluted with water. The parts per million (ppm) copper, lead, zinc and silver are measured by atomic absorbtion.

For analysis of the 35 rock chips, the entire sample is crushed. Approximately 100 grams is then split and pulverized through a -200 mesh screen. A measured amount of the sifted material is then treated as were the soil samples. The parts per million (ppm) copper, lead, zinc and silver are then measured by atomic absorbtion.

These results are sent to Graycom Systems Limited, Calgary, Alberta. Using a logarithmic program, threshold and anomalous values are obtained.

**W. G. TIMMINS EXPLORATION & DEVELOPMENT LTD.**

**CONSULTING GEOLOGISTS**

## GEOCHEMICAL INTERPRETATION

Statistical treatment of geochemical results yielded four zones of anomalous silver values. Two of the larger silver anomalies to the south are in direct relation with the primary geophysical-VLF-EM conductor (A on map). The larger silver anomaly to the north is weaker and is coincidental with a strong zinc anomaly. This anomaly is along strike of the primary (geophysical VLF-EM) conductor to the north.

Down slope to the west there is a weak zinc anomaly and a smaller copper-zinc anomaly bordering a small silver anomaly that can be correlated with the secondary geophysical VLF-EM conductor.

In general, silver values produced a good fit with a normal distribution curve; copper values were normal with few high values; zinc values produced a strong anomaly and two weaker anomalies. Lead values were generally low throughout the property.

## GEOPHYSICAL VLF-EM INTERPRETATION

Geophysical VLF-EM readings were sent to Columbia Geophysical Services, Vancouver, B. C. and filtered using the Fraser Filtering method for 20 metre, 40 metre and 60 metre intervals.

There is a large anomaly striking at  $10^{\circ}$  -  $20^{\circ}$  that is continuous over 1200 metres on the upper plateau to the east of Hanson Lake. The values associated with the anomaly are slightly lower due to the masking and insulation effect related to the perma-frost in the area. Nevertheless, high values can be traced from the J.T. 13 claim northeasterly through the J. 14, 16, 24 and 29 claims. The conductor pinches and swells to a maximum of almost 300 metres, though the average is less.

A second smaller conductor strikes at  $340^{\circ}$  to the west of the map area. This conductor is discontinuous locally, but has been traced for over 800 metres. To the south it comes in contact with the prementioned anomaly. At this juncture, the largest width of the conductors is obtained.

#### CONCLUSIONS & RECOMMENDATIONS

The J.T. and H.L. claim groups consist of eighty eight mineral claims located on the west side of Forbes Hill in the Hanson Lake area, Yukon Territory. The adjoining claims to the north are the Lucky and Bear claims on Rambler Hill. The area has long been known for the occurrence of high grade silver mineralization at Galena and Keno Hill.

The claims are underlain by the Lower Schist unit of graphitic phyllites and phyllitic quartzites intruded by sills and lenses of metagabbro and metadiorite altered to greenstone.

**W. G. TIMMINS EXPLORATION & DEVELOPMENT LTD.**

**CONSULTING GEOLOGISTS**

An airborne magnetometer, VLF-EM and radiometric survey was conducted over the J.T. claim group in September, 1979 by Columbia Geophysical Services Ltd. and the data compiled, mapped and contoured. This is contained in Appendix I.

In July, 1981 geochemical soil sampling, ground VLF-EM, and surface geology was done on the J.T. claim group focusing primarily on the highs depicted by the airborne survey. This work confirmed suspicion that the magnetic highs were due to greenstone intrusions, which contain minor magnetite on the upward slopes of Forbes Hill.

Ground VLF-EM results were Fraser Filtered. A large anomaly striking at  $10^{\circ}$  -  $20^{\circ}$  and more than 1200 metres in length occurs on the upper plateau to the east of Hanson Lake. This linear anomaly is contained in the J.T. 13, 14, 16, 24 and 29 claims. The conductor pinches and swells to a maximum of almost 300 metres, though the average width would be much less. The anomaly although large, is very weak, which may in part be due to the thickness of overburden, which is believed to be up to ten metres, and the presence of perma-frost in most of the area.

A second weaker conductor, trending about  $340^{\circ}$  and located to the west of the prementioned conductor, occurs over a length of almost 800 metres before converging with the large conductor at the southern end.

**W. G. TIMMINS EXPLORATION & DEVELOPMENT LTD.**

**CONSULTING GEOLOGISTS**

At present the conductors appear to have the fingerprints of a fault, and when considering the iron stain down hill and that much of the Keno Hill silver is fault related, the area would be expected to prove a worthwhile drill target.

Geochemical data indicates two silver anomalies associated directly with this conductor, indicating drill targets.

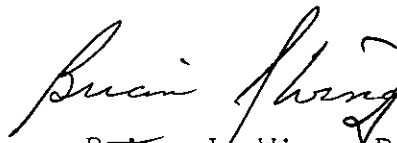
It should be noted that the programmes conducted in 1968 by Silver Springs Mines Ltd. and in 1971 by Canada Reserve Oil and Gas Limited did indicate small geophysical conductors and that they recommended further work. Their grids appear to be slightly to the west of the currently located conductive zone.

A preliminary programme of diamond drilling is warranted to further test geophysical and geochemical anomalous zones and is hereby recommended. The initial programme would consist of 2000 feet in 5 - 6 holes.

ESTIMATED COSTS OF PROGRAMME

1. Diamond Drilling, 2000' @ \$40/ft.	\$ 80,000.00
2. Engineering, supervision, core logging, assaying, maps, reports, etc.	25,000.00
3. Transportation, communication, camps, etc.	15,000.00
Contingency @ 15%	18,000.00
	<hr/>
	\$138,000.00

Respectfully submitted:



Brian J. Wing, B. Sc.



W. G. Timmins, P. Geol.

October 6, 1981

**W. G. TIMMINS EXPLORATION & DEVELOPMENT LTD.**

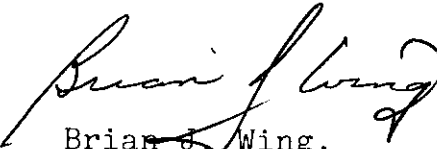
**CONSULTING GEOLOGISTS**

CERTIFICATE

I, BRIAN J. WING, employed by W. G. Timmins Exploration & Development Ltd, maintaining offices at 502 900 6th Avenue S. W., do hereby certify that:

1. I am a graduate of the University of Western Ontario, London Ontario, Canada, where I obtained my B. Sc. in geology in 1979.
2. I have been practising my profession for two years.
3. I have no interest direct or indirect in the property or securities of Hacienda Oil and Minerals Ltd. nor do I expect to receive any such interest.
4. This report is based on a Study of private reports, and a personal inspection of the property in July, 1981.

Dated October 14, 1981 at Calgary, Alberta

  
Brian J. Wing.

**W. G. TIMMINS EXPLORATION & DEVELOPMENT LTD.**

**CONSULTING GEOLOGISTS**

CERTIFICATE

I, WILLIAM G. TIMMINS, maintaining offices at 502 900 6th Avenue S. W., Calgary, Alberta do hereby certify that:

1. I am a geologist having been practising my profession for seventeen years.
2. I am a graduate of the Provincial Institute of Mining, Haileybury, Ontario, and have attended Michigan Technological University, Houghton, Michigan.
3. I am a member in good standing of the Association of Professional Engineers of British Columbia and of the Association of Professional Engineers, Geologists and Geophysicists of Alberta.
4. I have no interest direct or indirect in the property or securities of Hacienda Oil and Minerals Ltd., nor do I expect to receive any such interest.
5. This report is based on Government and private reports and maps and on the results of an inspection of the property in July, 1981 by Brian J. Wing.

Dated October 14, 1981 at Calgary, Alberta



W. G. Timmins, P. Geol

**W. G. TIMMINS EXPLORATION & DEVELOPMENT LTD.**

**CONSULTING GEOLOGISTS**

REFERENCES

Sevensma, P. H.: Summary Report, Geological Geophysical  
and Geochemical, 1968

Wilson, E. J. & Stemp, R. W.: A Geophysical Report on  
the Silver and Spring Claim Groups, 1971

Timmins, W. G.: Combined Geological and Geophysical Report  
on the J.T. Claim Group, 1980

APPENDIX I

## RESULTS OF MAGNETIC SURVEY

The magnetic survey has revealed an apparently east-west trending magnetic low with readings below 1500 gammas occurring over the southern half of the property. The 1700 gamma contour lines to the north and south of this low region are fairly straight and trend due east. There is some suggestion that this low is closed on the west; however the extent of the survey is not sufficient to confirm this.

The entire area of the survey is spotted with small circular or elliptical highs in the order of 2-300metres across.

## INTERPRETATION OF MAGNETIC DATA

Regional geologic mapping indicates that the J.T. group is underlain by phyllite and schist, with numerous widely distributed small bodies of greenstone. The small magnetic highs in the northern part of the map area correlate fairly well with small lenses of greenstone on the geologic map.

The magnetic low area in the south-central part of the property correlates fairly well with a low on the regional airborne survey (map 3387G McQuesten Lake). This regional low, and a number of others, form a double line trending 065 that appears to reflect the axes of an overturned syncline and anticline mapped on Forbes Hill as plunging at a shallow angle in a direction of 245°. The axis of the syncline projects through the magnetic low on the airborne property survey.

The fairly uniform magnetics, along the southern boundary of the survey area appear to agree with the east-west trending 'saddle' between Hanson Lake and Ladue Lake that is shown on the regional aeromagnetic map.

**W. G. TIMMINS EXPLORATION & DEVELOPMENT LTD.**

**CONSULTING GEOLOGISTS**

## RESULTS OF VLF-EM SURVEY

The VLF-EM has revealed three conductive zones in the eastern part of the property. The largest appears to span claim no's 29-36 and has a lineation of about 140°. The two others appear to be much smaller and be in claim no's 25 and 26. These anomalies are too small for any meaningful lineation to be interpreted.

The two smaller EM anomalies appear to be remnants of the larger anomaly displaced by faulting or folding; supported by evidence that the high zone of a large-scale overturned syncline passes through or in proximity to this area.

## RESULTS OF RADIOMETRIC SURVEY

The radiometric survey has revealed only one anomaly that correlates with a magnetic high on a hilltop. This anomaly may be due to a concentration of potassium within a greenstone intrusive.

# W. G. Timmins Exploration & Development Ltd.

## CONSULTING GEOLOGISTS

#502, 900 - 6th AVENUE S.W.  
CALGARY, ALBERTA T2P 3K2  
(403) 264 - 1415  
Telex 03-822764

### Statement of Costs on the J.T. Claim Group, Yukon For Hacienda Oils & Minerals.

WAGES	25,250.00
FEES W.G. TIMMINS	2,800.00
VLF-EM UNIT RENTAL	600.00
MAGNETOMETER UNIT RENTAL	600.00
STATION WAGON RENTAL	1,690.50
ACCOMMODATION	947.97
MEALS	3,690.35
GAS	724.50
GENERAL SUPPLIES(food for camp etc..)	2,746.22
SUNDRY	181.70
ASSAYS	2,361.00
COMPUTER ANALYSIS TIME	859.54
PHONE CALLS	369.97
DRAFTING OF MAPS	698.18
STUDY AND COMPILATION OF DATA FOR FINAL REPORT.	4,000.00
TOTAL	<hr/> 47,519.93

APPENDIX II



# TERRAMIN RESEARCH LABS LTD.

## ANALYTICAL REPORT

Job # 81-206

Date September 2nd, 1981

Client Project W. G. Timmins Exploration and Development Limited  
Attention: Brian Wing

Page 1 of 5

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm
Number 111001	34	10	90	0
02	31	17	71	0.8
03	37	11	95	0
04	36	12	129	0.3
05	24	10	57	0.4
06	26	14	74	0
07	21	11	65	0
08	29	10	65	0
09	20	7	54	0
10	19	6	56	0
11	24	8	59	0
12	19	9	44	0
13	32	12	49	0
14	46	7	80	0
15	135	2	230	0.2
16	111	3	95	0
17	300	16	75	1.0
18	54	17	50	1.3
19	25	8	93	0
20	40	9	160	0
21	58	11	125	0
22	39	8	124	0
23	52	12	115	0
24	71	7	240	0



# TERRAMIN RESEARCH LABS LTD.

## ANALYTICAL REPORT

Job # 81-206

Date

Client Project W. G. Timmins Exploration and Development Limited  
Attention: Brian Wing

Page 2 of 5

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm
Number 111025	40	8	123	0
26	39	10	154	0
27	51	10	169	0
28	138	11	370	0.3
29	162	16	570	0.5
30	52	9	250	0
31	18	7	49	0.2
32	49	2	182	0
33	18	13	81	0
34	169	11	88	0
35	34	10	90	0
36	40	9	78	0
37	21	8	59	0
38	33	10	70	0
39	24	9	50	0
40	63	3	330	0
41	61	10	93	1.3
42	57	15	154	0.3
43	55	16	135	0.6
44	63	14	173	0
45	64	12	141	0.2
46	56	15	133	0
47	32	10	89	0
48	41	12	100	0
49	37	7	82	0



# TERRAMIN RESEARCH LABS LTD.

## ANALYTICAL REPORT

Job # 81-206

Date

Client Project W. G. Timmins Exploration and Development Limited  
Attention: Brian Wing

Page 3 of 5

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm
Number 111050	22	8	51	0
51	14	10	36	0
52	55	9	40	0
52B	56	10	95	0
53	59	5	58	0
54	48	9	58	0
55	9	6	36	0
56	16	11	60	0
57	19	6	40	0
58	24	9	58	0.4
59	74	10	92	0
60	57	9	172	0
61	102	15	480	0
62	51	17	360	0.2
63	63	13	350	0.1
64	85	4	126	0
65	45	8	130	0
66	82	7	136	0.3
67	131	17	138	0.8
68	21	5	173	0.2
69	107	16	122	0.6
70	29	12	68	0.2
71	86	20	72	0
72	200	2	530	0.2
73	13	7	63	0



# TERRAMIN RESEARCH LABS LTD.

## ANALYTICAL REPORT

Job # 81-206

Date

Client Project W. G. Timmins Exploration and Development Limited  
Attention: Brian Wing

Page 4 of 5

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm
Number 111074	15	11	60	0.1
75	95	30	154	0
76	41	9	101	0
77	21	9	81	0.4
78	50	15	171	0.5
79	42	16	141	0.4
80	37	15	140	0.1
81	30	11	145	0.4
82	56	17	260	0.3
83	42	16	260	0.2
84	43	12	177	0.2
85	53	15	230	0.3
86	14	18	70	0
87	50	33	320	1.1
88	82	10	320	0.9
89	93	21	175	0.2
90	76	19	250	0.1
91	66	18	124	0.2
92	49	15	100	0.4
93	84	19	96	0.3
94	47	9	137	0.1
95	108	5	46	0.4
96	46	13	191	0.3
97	60	14	160	0.2
98	14	16	88	0.1



# TERRAMIN RESEARCH LABS LTD.

## ANALYTICAL REPORT

Job # 81-206

Date

Client Project W. G. Timmins Exploration and Development Limited  
Attention: Brian Wing

Page 5 of 5

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm
Number 111099	97	19	165	0.5
100	65	11	144	0.1
01	80	7	118	0.2
02	49	17	103	0.2
03	62	8	30	0.1
04	72	15	117	0.1
05	12	12	49	0
06	41	14	128	0
07	40	18	113	0.1
08	30	14	90	0.4
09	58	26	88	0
10	45	14	260	0.2
11	20	11	110	0.1
12	87	13	138	0.2
13	42	24	185	0.5
14	26	16	176	0.3
15	53	15	260	0.2
JT8 10610	20	310	66	1.3



# TERRAMIN RESEARCH LABS LTD.

## ANALYTICAL REPORT

Job # 81-199

Date September 4th, 1981

Client Project

Page 1 of 9

W. G. Timmins Exploration and Development Limited  
Attention: Brian Wing

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm
Number 111251	75	13	119	0.4
2	90	19	157	0.7
3	69	16	118	0.2
4	86	16	125	0.6
5	27	3	56	0.1
6	30	5	75	0
7	60	14	120	0.3
8	71	15	115	0.3
9	45	9	133	0.1
60	62	16	106	0.4
1	52	11	109	0.7
2	95	14	133	0.8
3	79	15	100	0.5
4	72	13	107	0.6
5	75	12	108	0.4
6	64	11	115	0.5
7	83	13	110	0.6
8	57	12	85	0.8
9	48	19	118	0.1
70	70	20	130	0.4
1	62	14	93	0.3
2	61	16	106	0.3
3	51	14	93	0.4
4	56	18	124	0.4



# TERRAMIN RESEARCH LABS LTD.

## ANALYTICAL REPORT

Job # 81-199

Date

Client Project W. G. Timmins Exploration and Development Page 2 of 9  
Attention: Brian Wing

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm
Number 111275	80	16	108	0.5
76	42	12	200	0.5
77	87	16	144	1.1
78	43	8	101	0.7
79	80	20	146	0.4
80	18	11	103	0
81	58	8	68	0.1
82	135	15	160	0.7
83	66	16	121	0.4
84	48	13	91	0.2
85	80	14	114	0.4
86	53	9	93	0.5
87	65	13	200	0.2
88	48	6	200	0.2
89	17	3	28	0.1
90	50	11	260	0
91	81	8	96	0.5
92	37	8	132	0
93	15	4	58	0
94	45	13	91	0
95	11	9	30	0
96	30	16	160	0.2
97	25	12	97	0.3
98	13	10	22	0.3
99	60	21	182	0.2



# TERRAMIN RESEARCH LABS LTD.

## ANALYTICAL REPORT

Job # 81-199

Date

Client Project

W. G. Timmins Exploration And Development  
Attention: Brian Wing

Page 3 of 9

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm
Number 111300	30	16	130	0.2
01	75	5	34	0.4
02	60	26	143	0.7
03	85	16	190	0.2
04	145	4	116	0.3
05	44	5	203	0
06	58	3	40	0.2
07	121	15	175	0
08	34	3	14	0.3
09	38	7	80	0.2
10	81	9	148	0.4
11	62	6	194	0.2
12	57	13	135	0
13	38	8	100	0
14	54	10	100	0
15	55	17	112	0
16	104	9	88	0.3
17	55	11	108	0
18	65	12	95	0
19	68	4	84	0.1
20	113	10	150	0.4
21	57	15	122	0
22	79	12	97	0
23	70	12	128	0



# TERRAMIN RESEARCH LABS LTD.

## ANALYTICAL REPORT

Job # 81-199

Date

Client Project

Page 4 of 9

W. G. Timmins Exploration and Development  
Attention: Brian Wing

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm
Number 111324	77	14	126	0
25	61	13	133	0
26	40	5	87	0
28	60	9	140	0
30	37	12	72	0
31	40	11	142	0
32	35	15	166	0
33	55	16	168	0.1
34	56	16	73	0
35	77	18	200	0.3
36	40	18	174	0
38	65	13	80	0.1
40	22	11	187	0
41	31	12	179	0
42	24	10	182	0
43	62	9	410	0.4
44	128	12	230	0.4
45	20	7	100	0
46	60	11	122	0.3
47	56	6	88	0
48	47	14	152	0.5
49	65	18	200	1.0
50	39	20	140	0.2
51	40	11	62	0
53	53	17	147	0



# TERRAMIN RESEARCH LABS LTD.

## ANALYTICAL REPORT

Job # 81-199

Date

Client Project

W. G. Timmins Exploration and Development  
Attention: Brian Wing

Page 5 of 9

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm
Number 111354	71	22	176	0.2
57	76	9	79	0
58	30	48	92	0
63	120	15	93	0
65	118	3	19	0
66	36	16	186	0
67	40	13	190	0
68	60	16	200	0
71	50	3	62	0
72	81	23	142	0
77	63	10	62	0
78	32	11	97	0
79	58	14	130	0
80	76	14	193	0
81	52	13	161	0
82	76	9	125	0
83	35	8	140	0
84	59	12	148	0
85	51	7	120	0
86	55	10	139	0
87	60	13	145	0
88	70	9	161	0
89	83	14	106	0.3
90	32	8	77	0.4
91	48	15	141	0



# TERRAMIN RESEARCH LABS LTD.

## ANALYTICAL REPORT

Job # 81-199

Date

Client Project

W. G. Timmins Exploration and Development  
Attention: Brian Wing

Page 6 of 9

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm
Number 111392	41	16	157	0
95	210	2	240	0
97	162	7	129	0.3
98	22	8	89	0
99	151	11	60	0.2
400	80	12	63	0
01	32	7	41	0
02	44	28	77	0
03	42	9	90	0
04	120	9	55	0
05	160	4	37	0
06	66	35	83	0.3
07	36	29	160	0
08	10	11	39	0
09	20	10	68	0
10	37	9	96	0
11	29	16	88	0
12	33	15	54	0
13	28	10	57	0
14	53	12	75	0
15	25	8	71	0
16	60	12	118	0
17	75	14	62	0
18	56	7	69	0
19	124	16	33	0



# TERRAMIN RESEARCH LABS LTD.

## ANALYTICAL REPORT

Job # 81-199

Date

Client Project

W. G. Timmins Exploration and Development  
Attention: Brian Wing

Page 7 of 9

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm
Number 111420	29	7	52	0
21	34	8	66	0
22	34	7	110	0
24	30	6	75	0
25	67	9	97	0
26	50	13	127	0
27	59	14	153	0
28	133	2	63	0
29	46	10	168	0
30	69	10	199	0
31	122	8	159	0
32	62	9	208	0
33	44	7	134	0
34	42	8	130	0
35	44	6	93	0
36	42	2	85	0
38	26	12	77	0
39	28	20	52	0
40	17	8	44	0
41	85	10	79	0
42	195	4	76	0
43	51	6	60	0
44	60	0	53	0
45	171	0	210	0.4
46	40	6	78	0



# TERRAMIN RESEARCH LABS LTD.

## ANALYTICAL REPORT

Job # 81-199

Date

Client Project

W. G. Timmins Exploration and Development  
Attention: Brian Wing

Page 8 of 9

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm
Number 111447	23	5	42	0
48	152	7	44	1.3
49	41	8	67	0
50	51	9	83	0
51	28	8	56	0
52	24	10	82	0
53	30	9	95	0
54	35	15	115	0.2
55	82	14	197	0.3
56	103	15	200	0.1
57	75	10	189	0
58	112	2	63	0.2
59	55	10	127	0
60	62	6	104	0
61	27	1	43	0
62	48	11	191	0.1
63	146	9	161	0.8
64	50	9	194	0
65	170	22	190	0.6
66	37	8	116	0
67	53	13	140	0
68	50	4	110	0
69	110	16	250	0
70	45	12	160	0.4
71	20	10	85	0.2



# TERRAMIN RESEARCH LABS LTD.

## ANALYTICAL REPORT

Job # 81-199

Date

Client Project

W. G. Timmins Exploration and Development  
Attention: Brian Wing

Page 9 of 9

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm
Number 111472	50	12	118	0
73	94	10	68	0
74	77	2	14	0
75	76	0	188	0
76	49	13	76	0
77	38	13	26	0
78	25	7	61	0
79	36	8	75	0
80	37	9	80	0
81	51	10	76	0.1
82	60	8	78	0
83	25	12	55	0
84	89	14	46	0
85	70	12	70	0
87	34	11	68	0
88	23	7	34	0
89	25	12	71	0
90	35	19	94	0
91	50	13	120	0



# TERRAMIN RESEARCH LABS LTD.

## ANALYTICAL REPORT

W.G. TIMMINS EXPLORATION & DEVELOPMENT LTD.

Job #81-199-B

Date September 11, 1981

Client Project Attention: Mr. Brian Wing

Page 1/1

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm
111327	29	3	54	0
29	138	2	117	0.3
37	69	1	105	0.2
39	94	3	94	0.5
52	53	2	153	0.2
55	39	15	187	0.4
56	42	3	70	0
59	30	10	63	0
60	84	12	101	0.4
61	127	0	144	0.4
62	370	0	162	1.1
64	73	5	83	0.4
68A	123	8	57	0.7
69	22	12	58	0.4
70	23	7	160	0.2
73	119	7	93	0.3
74	118	2	69	0.4
75	150	9	56	0.2
76	66	0	45	0
93	10	6	92	0
94	48	4	104	0
96	127	12	125	0.5
111423	151	0	111	0.1



# TERRAMIN RESEARCH LABS LTD.

## ANALYTICAL REPORT

Job # 81-206

Date 3 November 1981

Client Project W.G. Timmins Exploration and Development Limited  
Attention: Brian Wing

Page 1 of 1

Sample No.	Au ppb
Number 111015	< 2
16	< 2
40	< 2
86	< 2
JT8 10610	< 2
111068	< 2
71	< 2
72	< 2



# TERRAMIN RESEARCH LABS LTD.

## ANALYTICAL REPORT

Job # 81-231

Date 3 November 1981

Client Project W.G. Timmins Exploration and Development Limited

Page 2 of 2

Sample No.	MnO	TiO <sub>2</sub>
Rock	%	%
111118	0.192	2.82
36	0.155	2.12
37	0.188	2.84
41	0.110	0.68
49	0.141	2.20
63	0.172	2.30
64	0.146	2.10
67	0.194	2.95



# TERRAMIN RESEARCH LABS LTD.

## ANALYTICAL REPORT

Job # 81-231

Date 3 November 1981

Client Project W.G. Timmins Exploration and Development Limited

Page 1 of 4

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mo ppm
No. 111116	12	10	53	0	0
7	164	15	115	0.2	0
9	79	9	52	0.1	0
20	97	13	95	.4	0
21	106	14	211	.7	1
111122	85	14	151	.7	1
23	48	8	130	.2	0
24	90	11	270	.1	1
25	75	12	280	.2	0
26	67	13	206	0	0
27	83	9	290	.3	0
28	89	8	176	.1	0
29	72	13	181	.1	0
30	62	9	179	.2	0
31	43	12	134	.1	0
32	89	9	112	.3	0
33	119	15	130	.2	1
34	92	12	100	.1	1
35	90	12	119	.1	0
38	22	9	61	0	1
39	41	12	120	0	2
40	13	10	50	0	0
42	31	13	75	0	0
43	26	7	69	.2	0
44	159	24	58	1.2	2



# TERRAMIN RESEARCH LABS LTD.

## ANALYTICAL REPORT

Job # 81-231

Date 3 November 1981

Client Project W.G. Timmins Exploration and Development Limited

Page 2 of 4

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mo ppm
No. 111145	94	30	84	1.1	2
46	59	9	79	.3	0
47	22	8	60	.1	0
48	55	7	81	.3	1
50	110	9	84	.4	0
51	93	10	87	.2	0
52	60	13	104	.3	0
53	91	12	145	.2	0
54	59	9	77	.1	0
55	71	11	159	.3	0
56	86	10	126	.3	1
57	56	9	103	0	0
58	92	9	102	.2	0
59	110	14	121	.2	1
60	79	12	79	0	0
61	121	18	120	.2	1
62	53	9	77	0	0
65	96	16	110	.7	0
66	13	11	49	0	1
68	54	13	139	0	0
69	81	9	151	.2	0
70	56	5	170	.1	0
71	102	11	212	.1	1
72	87	15	120	.1	0
73	92	7	124	.3	0



# TERRAMIN RESEARCH LABS LTD.

## ANALYTICAL REPORT

Job # 81-231

Date 3 November 1981

Client Project W.G. Timmins Exploration and Development Limited

Page 3 of 4

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mo ppm
No. 111174	67	5	81	0	0
75	82	10	91	.1	0
76	44	8	79	0	0
77	58	9	118	0	0
78	104	11	179	.7	1
79	70	9	135	.5	0
80	50	7	146	.2	0
81	82	9	107	.1	0
82	51	6	106	.3	0
83	55	10	116	.2	1
84	64	6	159	.2	0
85	84	10	181	1.0	2
86	82	5	126	.6	0
87	51	8	84	.4	0
88	43	9	131	.2	0
89	79	10	179	.4	1
90	52	7	63	.3	0
91	39	6	124	.5	0
92	52	14	169	.6	1
93	63	8	113	.1	0
94	64	12	100	.5	1
95	51	9	102	.3	0
96	62	8	114	.2	0
97	109	11	156	.8	0
98	59	12	154	.2	0



# TERRAMIN RESEARCH LABS LTD.

## ANALYTICAL REPORT

Job # 81-231

Date 3 November 1981

Client Project W.G. Timmins Exploration and Development Limited

Page 4 of 4

Sample No.	Cu ppm	Pb ppm	Zn ppm	Ag ppm	Mo ppm
No. 111199	66	10	126	.4	1
111200	74	9	109	.3	0
201	67	10	153	.4	0
202	56	10	130	.2	2
203	82	9	164	.5	2
204	61	8	131	.4	1
205	47	7	106	.1	0
206	44	9	71	.1	0
207	46	8	116	.1	0
208	41	10	106	.2	0
209	52	12	98	.2	1
210	47	7	124	0	0
211	50	12	146	.2	1
212	61	10	137	.3	0
213	97	8	166	.4	1
111118	51	3	60	.4	0
136	123	4	57	.1	0
37	134	1	98	.3	0
41	24	6	49	0	1
49	118	0	145	.3	0
63	95	0	123	0	0
64	70	3	55	0	0
67	158	4	106	.1	0

# W. G. Timmins Exploration & Development Ltd.

## CONSULTING GEOLOGISTS

#502, 900 - 6th AVENUE S.W.  
CALGARY, ALBERTA T2P 3K2  
(403) 264 - 1415  
Telex 03-822764

April 6, 1982

Mayo Mining Recorder,  
Box 10,  
Mayo, Yukon Territory

Attention: R. G. Ronaghan

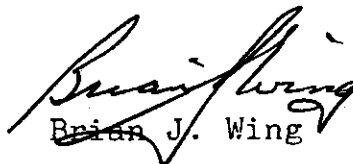
Dear Sir:

With regard to your letter of March 11, 1982 requesting additional information for assessment of JT & HL Claims, enclosed please find the following:

- final report with costs included
- geochemical statistics sheet as well as values plotted on maps
- geophysical profiles as well as raw geophysical data plotted on maps at appropriate locations.

We trust that this information meets your requirements.

Yours truly,

  
Brian J. Wing

BJW:k  
Encl.



090912



COPY

Mayo, Y.T.

P.O. Box 10

11th March, 1982

W. G. Timmins Exploration & Development Ltd.  
502 - 900 6th Avenue S.W.  
Calgary, Alberta.

Your file    Votre référence

Our file    Notre référence

Attention: Brian J. Wing

JT & HL Mineral Claims  
Geochemical, Geophysical & Geological survey  
Mayo Mining District

Please be advised that our Engineering Evaluation Section in Whitehorse have requested further information on your report filed in December, 1981.

There was no statement of costs enclosed with the report only your proposed future budget for next year.

The report also requires copies of the geophysical readings or profiles. It notes that they were taken but no values were given.

The report does not give the geochemical analyses which correspond to the sample locations.

I therefore am requesting your supply of these items in duplicate for inclusion in the report filed. Your expeditious attention to this matter would be appreciated.

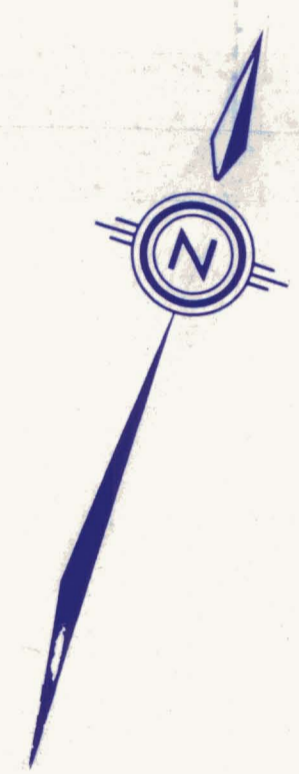
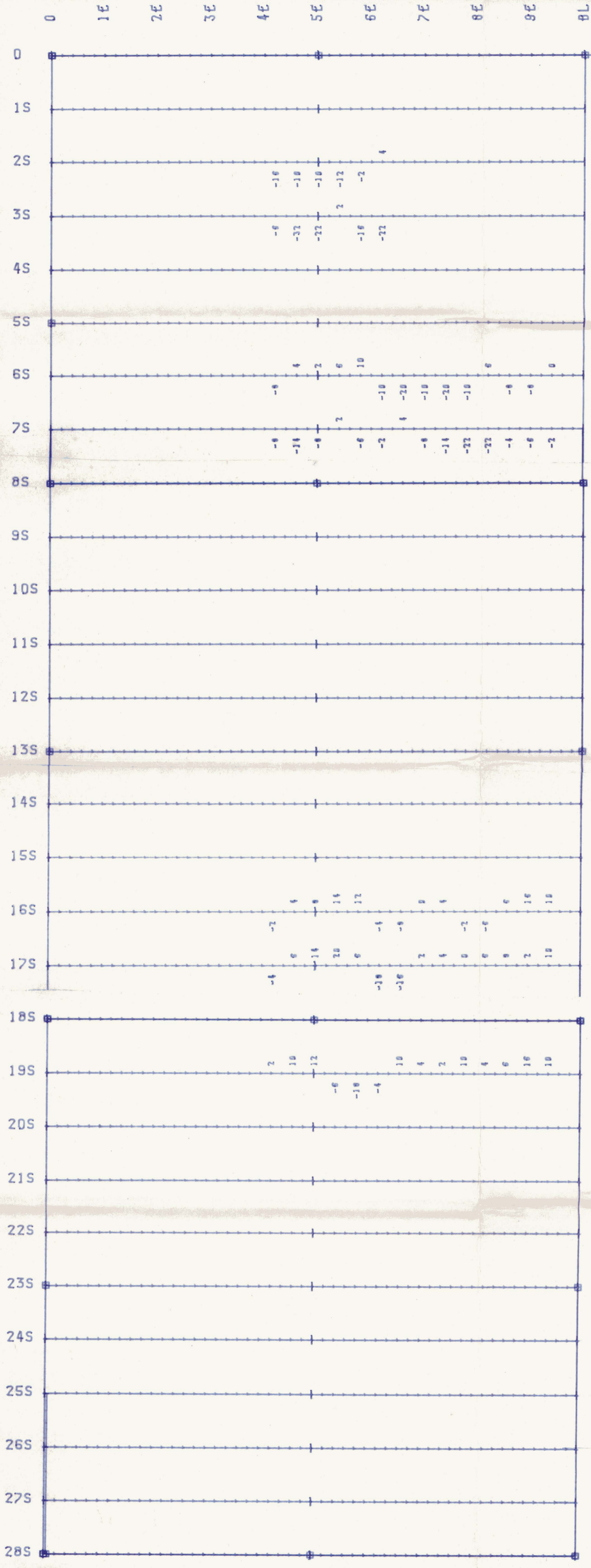
A copy of our schedule of representation work is enclosed for your information with marked areas of above requirements.

Yours truly,

R. G. Ronaghan  
Mining Recorder  
Mayo Mining District

090912





Hacienda Oil & Minerals Ltd.

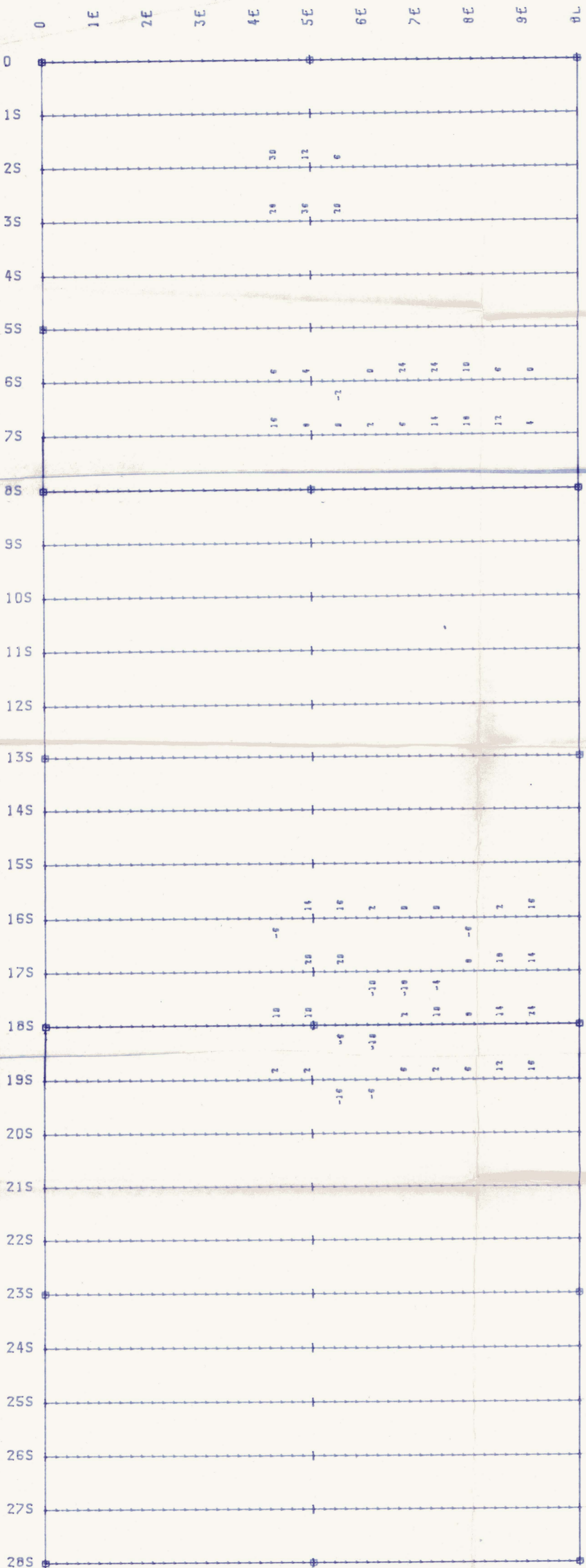
J.T. Claim Group

VLF-EM Survey 40m filtering

Scale 1:5000

1981

090912

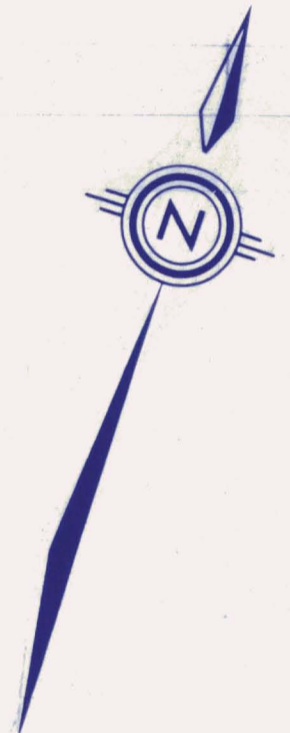
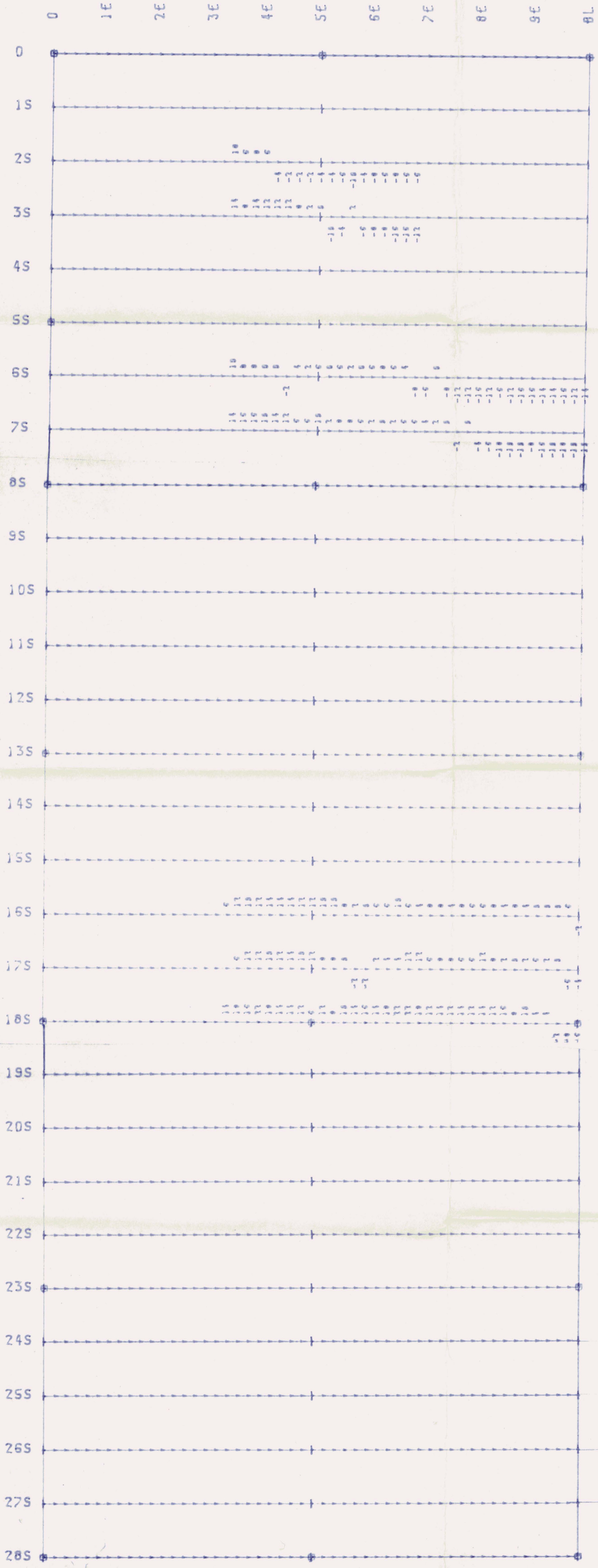


HA CIENDA OIL & MINERALS

J.T. CLAIM GROUP

VLF-EM 60M FILTER

SCALE: 1:5000



Hacienda Oil & Minerals Ltd.

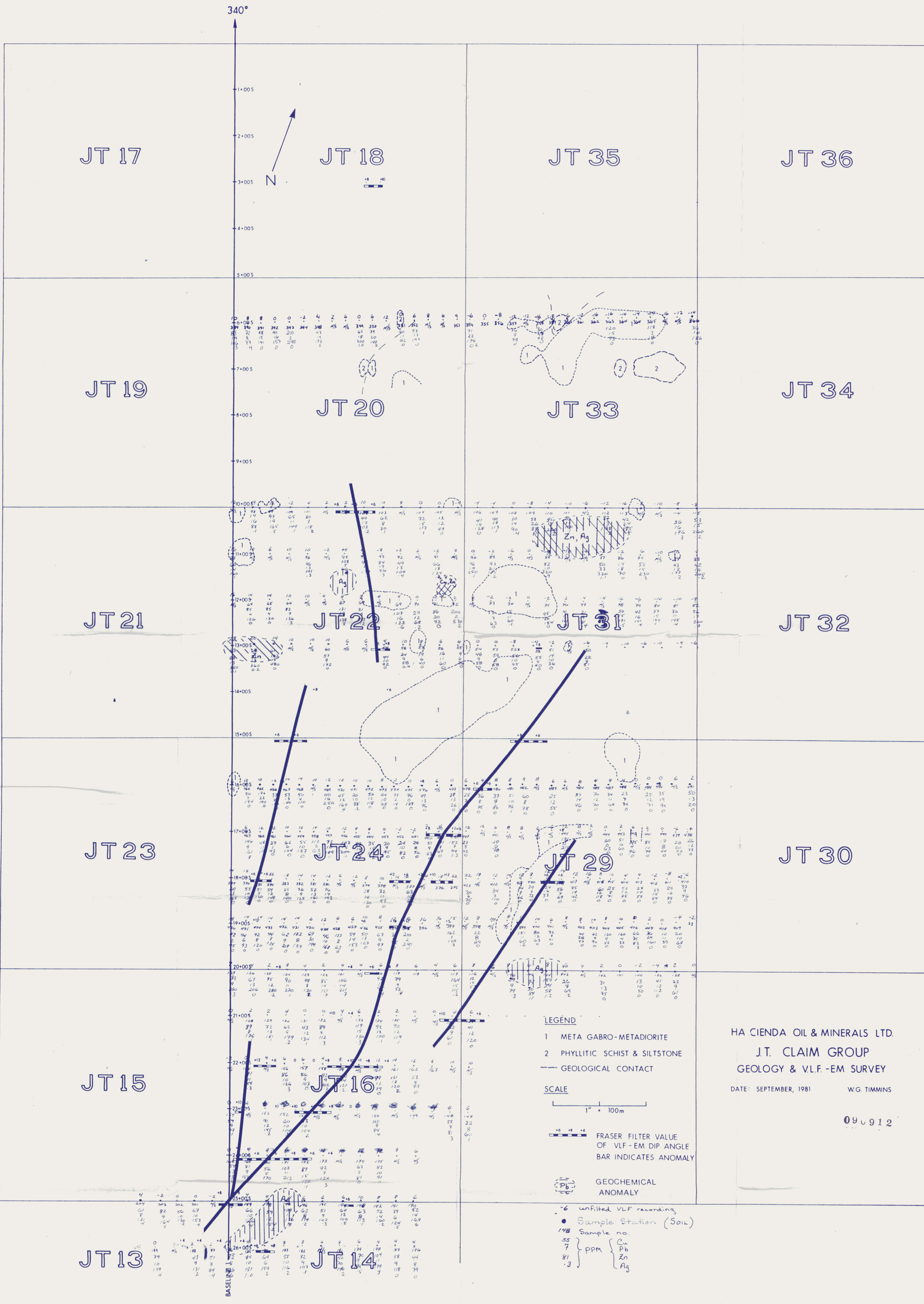
J.T. Claim Group

VLF-EM Survey Dip Angle

Scale 1:5000

1981.

090912



JT 17

JT 18

JT 35

JT 36

JT 19

JT 20

JT 33

JT 34

JT 21

JT 22

JT 31

JT 32

JT 23

JT 24

JT 29

JT 30

JT 15

JT 16

JT 13

JT 14

**LEGEND**

1 META GABRO-METADIORITE  
 2 PHYLLITIC SCHIST & SILTSTONE  
 --- GEOLOGICAL CONTACT

**SCALE**

1" = 100m

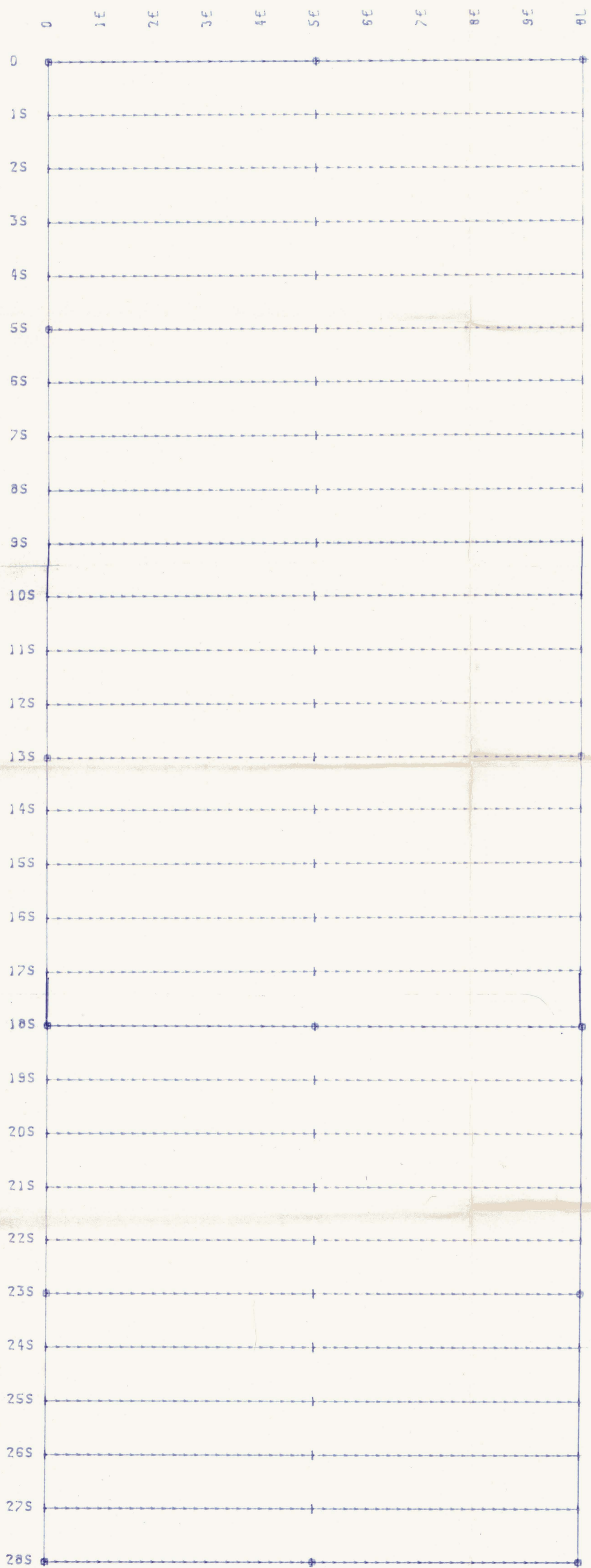
--- FRASER FILTER VALUE OF VLF-EM DIP ANGLE  
 BAR INDICATES ANOMALY

○ GEOCHEMICAL ANOMALY

○ unfiltered VLF recording  
 ● Sample Station (Soil)  
 148 Sample no.  
 55 } PPM { Cu  
 7 } Pb  
 81 } Zn  
 -3 } Ag

HA CIENDA OIL & MINERALS LTD.  
 J.T. CLAIM GROUP  
 GEOLOGY & V.L.F.-EM SURVEY  
 DATE: SEPTEMBER, 1981 W.G. TIMMINS

090912



Hacienda Oil & Minerals Ltd.

J.T. Claim Group.

VLF-EM Survey Grid Map.

Scale 1:5000

1981.

090912