86-4-15139

GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL REPORT

THANE 1 MINERAL CLAIM

08' Latitude 56° Worth Longitude 125° 23.5 West

OMINECA MINING DIVISION BRITISH COLUMBIA

FILMED

NTS 94C/3W GEOLOGICAL BRANCH ASSESSMENT PEPORT

for

Owner/Operator: SUNCOR INC. RESOURCES GROUP P.O. Box 38, 500 - 4 Ave. S.W. CALGARY, ALBERTA T2P 2V5

Golden Rule Resources Ltd. 150, 1300-BHST-S.W. Colgory, Alberta TZR IBZ

by Donald Cross, B.Sc.

December, 1985

# TABLE OF CONTENTS

	Page No.
Summary	1
Location and Access	2
Property and Ownership	3
Physiography and Glaciation	4
Past Work	5
1985 Program	6
Summary of Expenditures	7
Geology	8
Geochemistry	10
Geophysics	11
Conclusion	13
Recommendations	14
Author's Qualifications	15
Analytical Results	16
Analytical Procedures	17

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# LIST OF MAPS THANE 1

SCALE	DRAWING #
1:500	TH 001
1:2500	TH 002
1:2500	TH 003
1:2500	TH 004
1:2500	TH 005
1:2500	TH 006
1:2500	тн 007
	1:500 1:2500 1:2500 1:2500 1:2500 1:2500

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# SUMMARY

Eight man-days were spent between June 19 and July 5 carrying out soil sampling, magnetic and VLF surveys, geological mapping and sample on the Thane property.

A total of 17 soil samples and 12 rock samples were collected and analysed for Cu, Pb, Zn, Au, Ag, As.

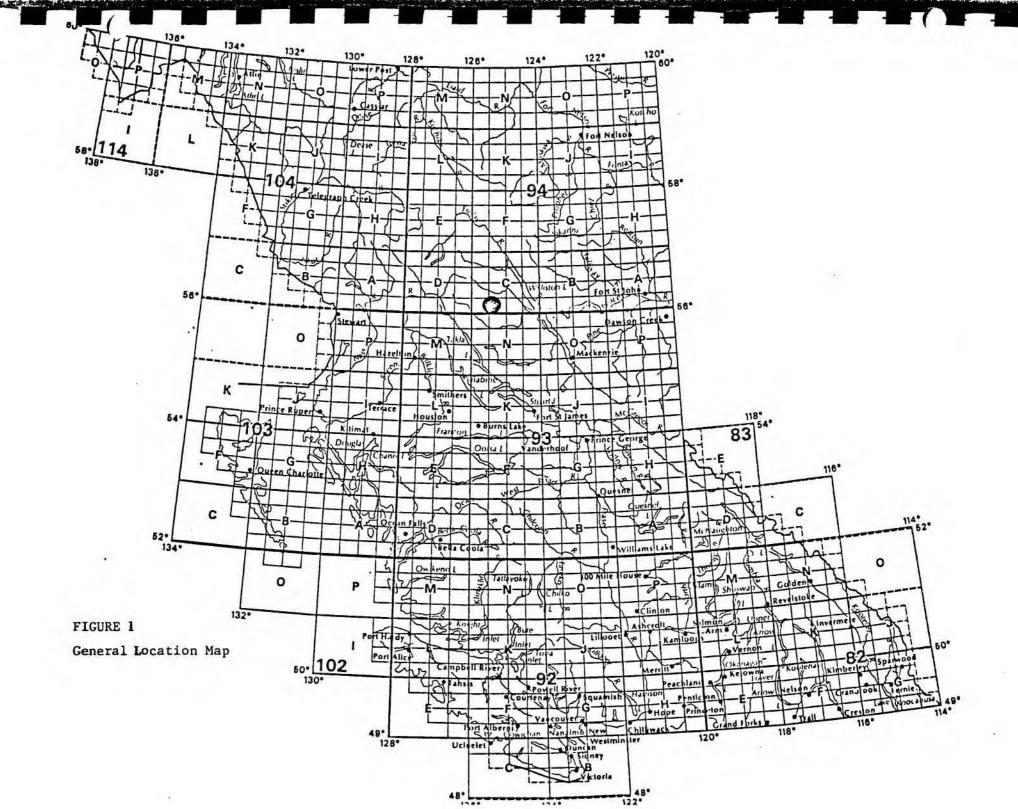
This work essentially confirms the presence of a massive arsenopyrite lens in a highly altered host rock where anomalous values in Cu and As and some sporadic anomalous Au values are encountered.

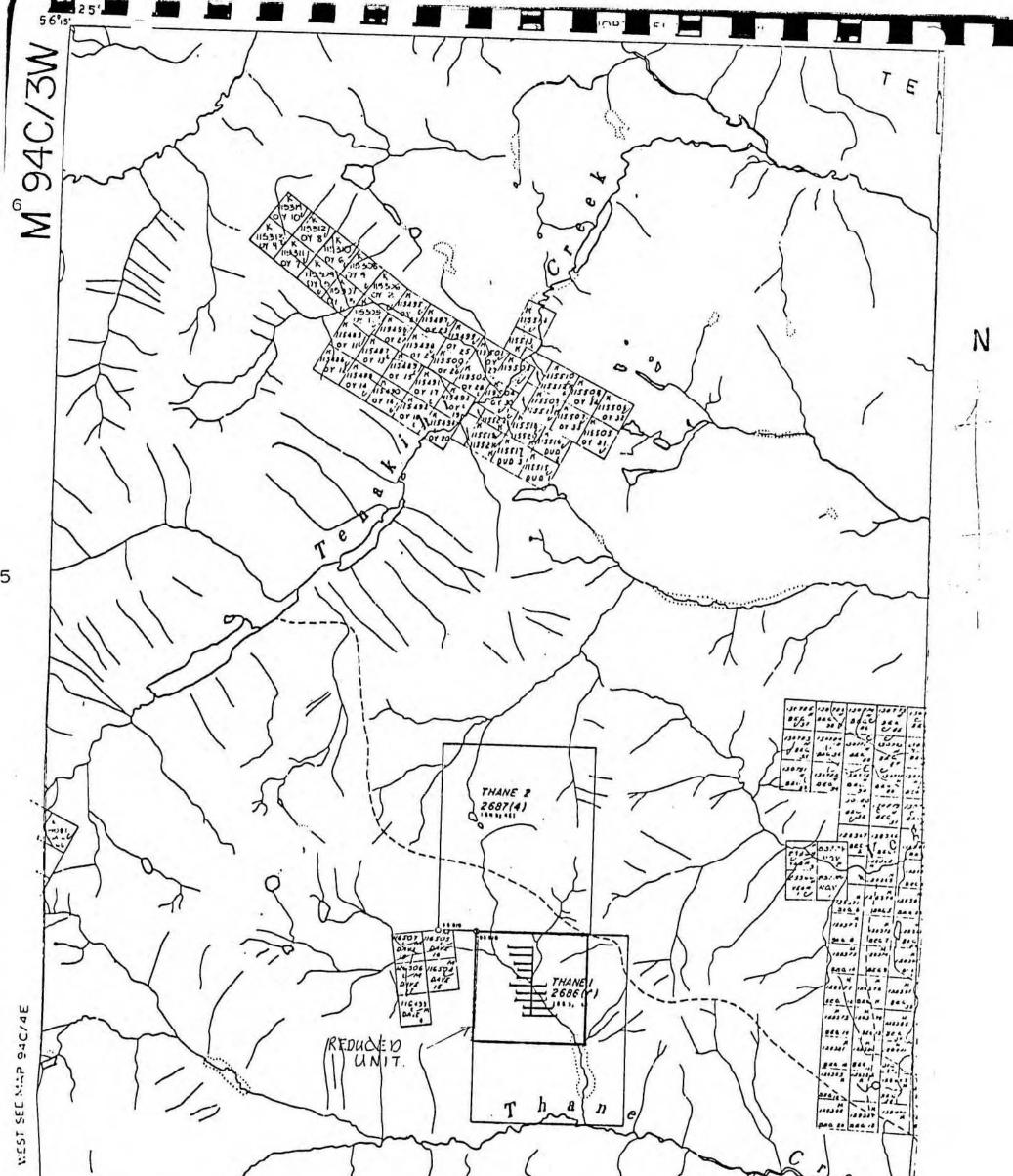
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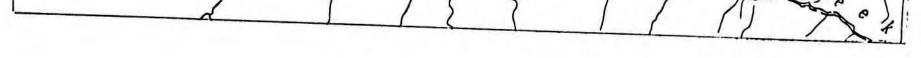
# LOCATION AND ACCESS

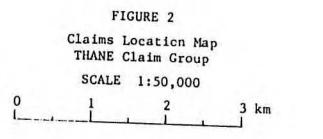
The Thane 1 claim is located within the Omineca Mining District in N.T.S. area 94C/3W approximately 300 km northwest of Prince George and 190 km northeast of Smithers, B.C. The claim straddles a southerly-flowing tributary of Thane Creek. Access to the claims can be gained by helicopter direct to the site or on foot via a trail which leaves the Omineca Development Road at Uslika Lake. The geographic centre of the claim is located at 56°08' North latitude and 125°23' West longitude.

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# PROPERTY AND OWNERSHIP

The Thane 1 claim consists of 16 units acquired by staking as follows:

			RECORD			
CLAIM		UNITS	NUMBER	DATE	OF	RECORD
Thane	1	9	2686	April	3,	1980

The claims were staked by Golden Rule Resources Ltd. and are subject to a farm-in agreement with Suncor Inc., dated June, 1985.

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#### PHYSIOGRAPHY AND GLACIATION

The claims lie within the Omineca Mountains of the Interior Plateau. The effects of glaciation are characterized by wide U-shaped, drift-filled valleys and V-shaped gullies cut into bedrock above treeline. Peaks average 6500 feet above sea level with treeline located at approximately 5000 feet above sea level.

The claims straddle an unnamed tributary of Thane Creek. The creek is located 13 km above the confluence of Thane Creek and the Osilinka River.

In general, the property lies between 4000 and 6000 feet above sea level. Its lower reaches are covered with good stands of spruce and pine. Above treeline outcrop exposure is confined to rugged peaks and steep parts of ridges.

#### PAST WORK

The Thane occurrence is recorded in the British Columbia Mineral Inventory under location 19 in N.T.S. 94C.

In the 1940's the Consolidated Mining and Smelting Company of Canada Ltd. (now Cominco) carried out prospecting and trenching of the Pluto occurrence.

In 1980, Golden Rule Resources Ltd. did two days of helicoptersupported - geological mapping, geochemical sampling, and ground VLF and magnetic surveying on a small grid. Only partial geochemical and geophysical coverage was obtained over the whole grid area on the Pluto prospect.

In 1982, Taiga Consultants Ltd. under contract to Golden Rule Resources Ltd., carried out one day of helicopter-supported soil sampling and reconnaissance stream sediment sampling. An anomalous trending of Ag-in-soils paralleling a weak northwesterly-trending conductive zone outlined by VLF resulted from this work program.

In 1984, Taiga Consultants Ltd., under contract to Golden Rule Resources Ltd. did extensive chip sampling over five sulphide lenses on the Pluto prospect. Arsenic values were very high (up to 97,000 ppm), Au values in rock reached a maximum of 0.080 oz/ton and Ag values reached a maximum of 0.123 oz/ton.

## 1985 PROGRAM

Suncor Inc. expended 8 man-days of work between June 19 and July 5, 1985 in performing 1.2 km of grid extension VLF surveying, soil sampling and 5.4 line km of ground magnetic surveying. Three man-days were spent in re-sampling trenches and prospecting.

Seventeen soil samples were collected and analyzed for Au, Ag and As. In addition 12 rock samples were collected and analyzed for Au, Ag, As and Cu.

- 7 -

# 1985 EXPENDITURES

Thane 1 Claim

# PERSONNEL

C. Hartley geologist	8	day	x	135.50	\$ 135.50
A. Smith geologist	5	day	x	135.50	135.50
W. Fisher prospector	4	day	x	123.72	123.72
I. Simpson geological assistant	21	day	x	72.49	217.47
S. Scott geological assistant	11	day	x	71.49	142.98
TRANSPORTATION					
Helicopter - Jet Ranger 206-B -6.5 hr	s (	a \$48	30,	'hr \$	3,120.00
Fixed wing support direct costs					533.90
Fixed wing support mob-demob prorated					1,554.39
Travel expenses prorated					709.10
CAMP SUPPORT 8 man-days @ \$50/day					400.00
o man aajo e çoo, aaj					100100
GEOCHEMICAL ANALYSIS					
17 soil samples x 15.15/sample					257.55
12 rock samples x 15.10/sample					
DOCT. DIRID					
<u>POST FIELD</u> Data plotting & report writing 5 day		2 610	0.0	/	930.00
	5 (	6 910	50/	uay	450.00
Drafting 18 hrs x \$25/hour Reproduction					
					200.00
Secretarial 8 hrs x \$15/hour				-	120.00
				1	\$9,211.31

#### GEOLOGY

Mapping by the Geological Survey of Canada (GSC Memoir 274) indicates the Thane claim to be underlain by the following rocks:

## Upper Jurassic or Lower Cretaceous

#### OMINECA INTRUSIONS

Granodiorite, adamellite-granite; quartz diorite; minor syenite, syenodiorite, diorite, alaskite, pegmatite, aplite, lamprophyre, and feldspar porphyry.

# Upper Triassic and Later

# TALKA GROUP

Andesitic flows and breccias; basalt; tuff; agglomerate, shale, conglomerate, limestone.

Outcrop exposure on the Thane grid area is limited to lenses of sulphide hosted by highly altered and sheared volcanics. The sulphide pods dip to the west at 60 to 65 degrees and strike northwesterly along the valley of Pluto Creek.

The shear zone is characterized by the presence of sulfide bodies with a high tenor of arsenic associated with quartz-carbonate alteration, possibly of exhalative origin.

Sampling of the sulfide pods to confirm earlier reported gold values was carried out by the Suncor field crew. The following results were obtained:

		Au oz/ton	Ag oz/ton	As %	Cu %
TH	2101	<0.003	<.01	0.04	
TH	2102	<0.010	0.03	0.02	
TH	2103	0.015	0.02	7.00	
TH	2104	0.069	0.05	6.00	
тн	2105	<0.003	<0.01	<0.01	
TH	2107	<0.003	<0.01	0.03	
TH	2109	0.050	<0.01	0.14	
TH	2110	0.003	0.109	2.80	0.03
тн	2111	0.003	0.10	0.05	2.82
TH	2112	0.003	0.01	0.27	0.05

The highest Au value returned was 0.069 oz/ton (sample TH 2104) followed by 0.05 oz/ton (sample 2109). These values do not correlate well with those of previous sampling programs. This is likely due to the fact that Au mineralization is erratically distributed in the sulfide bodies.

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## GEOCHEMISTRY

Seventeen soil samples were collected on lines 1+00N to 4+00N on the east side of the baseline where no previous sampling had been carried out. The samples were analyzed for Cu, Pb, Au, Ag by atomic absorption.

Except for two "spot highs", one Au sample of 67 ppb on line 1+00N, 0+00 and a Cu sample of 331 ppm on line 2+00N, 1+00E there is a poor response from soil sampling. This problem of poor response from soil sampling was noted by G.L. Wilson in his November 30, 1984 report.

Because the underlying rocks have been subjected to deep weathering and glaciation it is probable that near surface soil sampling does not fairly reflect the bedrock conditions.

# - 11 -

#### GEOPHYSICS

#### Ground magnetic survey

A total of 5.4 line km of magnetic surveying was completed on the extended grid over the Pluto occurrence.

The survey was successful in outlining a contact zone between magnetic and non-magnetic rocks running down the baseline of the grid.

The Pluto arsenopyrite occurrence is located on L0+00 at 0+50W overlying a linear magnetic low which strikes roughly northnorthwest. This magnetic low is characterized in bedrock by the presence of strong shearing and quartz-carbonate alteration. The known strike extent of the Pluto occurrence would appear to be greater than what has been identified by surface sampling techniques. The linear magnetic low extends from the baseline at 4+00S to line 2+00N at 2+00W.

#### VLF-EM suruvey

VLF surveying employing a Geonics EM-16 unit was carried out over the eastern portion of line 1+00N and lines 2+00N to 4+00N.

No true crossovers were recorded by the survey, however, a reduction of the in phase component from 27E to 7E on line 4+00N at 2+30W may reflect a conductor at this location.

No conductors exist in the area of the magnetic low and those that do exist to the east are weak and likely represent conductivity changes across a lithological contact.

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The long conductor outlined by the earlier survey terminates abruptly on line 0+00 just east of the baseline. It is possible that the northeast trending tributary of Pluto Creek is the site of faulting thereby truncating this anomaly which is hosted in the more magnetic rocks to the east.

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## CONCLUSIONS

Repeated sampling of the arsenopyrite-rich lenses has failed to return consistent values in Au mineralization which  $\operatorname{can}_{\lambda}^{hot}$  be duplicated by successive samplers.

Soil sampling does not appear to be a viable tool for tracing out strike extensions of this zone. Magnetic surveying has identified a linear, magnetic low which hosts the known sulphide lenses and indicates their strike extent to be as much as 600 metres.

VLF surveys indicate weak conductors that appear to be related to the higher magnetic intensity rocks to the east rather than the magnetic low.

Continued exploration of the claims would appear to be possible with the combined use of additional magnetic surveys and diamond drilling or backhoe trenching of favourable magnetic lows.

It must first be determined whether or not this target represents a viable economic situation worthy of additional effort.

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# RECOMMENDATIONS

In order to establish a reasonable basis on which to carry out additional exploration it is recommended that this target be tested by some short drill holes using a light, portable drill. Depending upon the results obtained from such a test future decisions regarding expansion of the grid can be made.

An EM survey using a higher frequency (3000-5000 HZ) may result in better definition of the sulfide bodies.

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Sampling of the B-horizon soil was carried out. This horizon is characterized by its brown to rusty-brown colour and a variable proportion of rock fragments consisting of weathered bedrock mixed with glacial till. Commonly this horizon is found from 4 to 8 inches below the surface.

Large rock fragments and roots are removed from the sample prior to bagging at least 1/2 pound of material. This is air-dried before shipment to a commercial laboratory for analysis.

All of the rock samples collected consisted entirely of pyrite - arsenopyrite mineralization hosted by Takla Group Andesite. This material occupies healed fracture zones in altered and gossanized bedrock. The fracture zones are near vertical in attitude thus reflecting their possible derivation from exhalative processes. The instrument used for this survey is a SCINTREX MP-2 proton precession magnetometer which measures the strength of the total magnetic field on the earth's surface.

The sensor head is located atop a staff which is maintained in a vertical position with a constant azimuth for each reading.

Each station is occupied and a total field reading, in gammas, is acquired. Tie-in points are established each time a reading is acquired on the baseline (see below).

Diurnal variation corrections are made to the total field value prior to plotting.

The field procedure for acquiring levelled data involves surveying the baseline stations within a short period of time, usually 2 hours or less, and establishing corrected values at each cross-line by adding or subtracting the calculated drift. This computation is made by comparing the value of a particular station at the start of the survey to its value recorded within 2 hours. This correction is then applied on a straight line basis according to elapsed time between readings to derive a corrected value for each station along the baseline.

Surveying of cross-lines is then carried out and all values are corrected for diurnal variation according to the values established earlier at each of the tie-in points along the baseline.

#### VLF-EM Survey Technique

The 1985 VLF-EM survey carried out by Suncor Inc. employed a Geonics EM-16 unit tuned to Seattle, Washington transmitter which lies approximately due south of the Thane property. This coupling will favour detection of conductive bodies aligned in a north-south orientation.

A sweep is made with the instrument to locate the transmitter station. All readings are taken with the operator facing in that direction. A null is acquired by tilting the instrument from side to side perpendicular to the station-transmitter axis to achieve a minimum in the signal strength and thereby measure the dip and intensity of the field at that point.

This value is recorded as either a West or East dip. A true cross-over occurs where the dips change from E to W when travelling in an easterly direction or W to E when travelling in a westerly direction.

# QUALIFICATIONS

I, Donald B. Cross of the City of Calgary, Alberta, do hereby certify that;

- 1. I hold an Honours Bachelor of Science Degree.
- I am a member of the Canadian Institute of Mining and Metallurgy.
- 3. I have practiced my profession for more than 11 years.
- 4. I personally supervised the field crew carrying out work detailed in the attached report.
- 5. I am employed by Suncor Inc. as an Exploration Geologist responsible for Technical Supervision of field projects.

Dated at Calgary, Alberta this 23rd Day of July, 1985.

Donald B. Cross

# ANALYTICAL RESULTS

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DATE 121885 PAGE .CATE 26 NOV 95 13:36:17 RID 35 16 NOV 85 MINERL + CHEMICAL LAE ANALYSIS REPORT FOR PROJECT : THANE 1 AND 2 LAB : APX (TYPE F) APS. PEUYR . RCCK.SAMPLE.AU . AU . 16 . AG . 45 .AS . CU .NUMPER.AA PPB.FAA "ZS.AA PPM.FAA OZS.AA PPM.FAA PCT.AA PPM 22221.22 ---............. PU 04785 TH2121 8.003 0.01 0.04 C.010 50 04785 TH2102 3.03 0.02 NU U4785 TH2107 5.615 0.02 7.00 80 C4785 TH2104 1.769 0.05 6.00 30 04785 TH2135 0.003 3.01 0.01 80 14785 TH2106 0.003 3.01 0.01 50 L4785 TH2107 C.003 0.01 0.03 80 L4785 TH2108 0.003 0.01 0.01 90 C4785 142109 1.753 3.01 0.14 80 64785 TH2110 n.no3 3.13 2.80 13 04785 TH2111 n. 103 3.10 0.05 50 64785 TH2112 0.203 0.01 0.27 42 04785 TH212" 0.103 3.01 1.32 40 04785 TH2126 0. 103 0.01 0.01 50 04785 TH2127 0.003 D.01 0.01 P3 24785 TH2128 n. 203 3.01 0.01 50 L 4785 TH6157 67 7.3 100 91 50 64785 TH6158 19 0.5 100 64 50 04785 146150 17 0.6 100 77 10 04795 TH6167 12 55 2.4 100 50 L 4785 TH6161 9 0.6 100. 331 50 04795 TH6162 9 0.3 100 39 50 04785 TH6163 14 0.3 100 72 54.64785 IH6154 9 3.6 100 109 50 04785 TH6165 12 3.5 100 69 50 14795 TH6166 12 0.4 100 71 50 04785 TH6167 .... 3.6 100 118 50 E4785 TH616P 9 0.3 100 27 50 64785 TH6169 24 3.4 100 75 50 04785 TH6170 14 1.4 100 44 50 C4785 TH6171 5 3.5 100 76 50 64785 TH6172 C.6 100 5 56 50 64785 IH6173 5 0.5 100 53 .... END REPORT

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**x** . . . DATE 121885 PAGE .DATE 26 NOV 85 13:36:18 RID 95 26 NOV 85 MINERL \*CHEMICAL LAB ANALYSIS REPORT FOR PROJECT: THANE 1 AND 2 LAB : APX (TYPE F) \*RS.PRJYR .ROCK.SAMPLF.PB • Z 1 .CJ . . • .NUMBER.AA PPM.AA PPM.FAA PCT. \* . .\*\*\*.\*<u>1212.222.2222.22222.22222.2222.2</u>.22222<u>.22222.2222.2222.2222.2222.2222.2</u>22222.2 80 C4785 TH2101 5C L4785 TH2102 80 04795 TH2107 SC C4785 TH2104 EU L4785 [H2105 80 L 4785 TH2106 20 04785 TH2107 80 (4785 TH210ª 86 04785 TH2109 86 04795 TH2110 0.03 TH2111 88 84795 2.82 80 L 4785 TH2112 0.05 80 04795 TH2125 80 C 4785 TH2126 80 64785 TH2127 80 04785 TH2128 50 04785 TH6157 10 72 50 04785 THEISE 9 4.9 50 04785 TH6159 12 87 50 04785 TH6160 7 66 50 04785 IH6151 47 50 64785 TH6162 41 50 E4785 TH6163 93 8 50 04795 TH6164 9 95 50 C4785 TH6165 12 140 50 04785 TH6166 11 127 50 64795 TH6167 8 44 50 04785 35 TH6168 7 50 04785 TH6160 104 6 50 04795 IH6170 98 9 53 84785 TH6171 10 128 50 04795 TH6172 20 196 50 04795 IH6173 9\_\_\_\_ 234 .... END REPORT .....

# ANALYTICAL PROCEDURES

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# APEX ANALYTICAL LABORATORIES, CALGARY

SAMPLE PREPARATION

#### ROCKS AND DIAMOND DRILL CORE:

These samples are crushed by a primary jaw crusher then through a secondary cone crusher to a particle size of 1/4 inch. The sample is now riffled and a 200 gram portion is kept and pulverized in a temer mill to -200 mesh fraction. The remainder of the sample is kept as a reject. The pulverized sample is rolled to make sure it is well mixed and is then weighed and analyzed.

# SOILS

Soil samples are dried and then screened through a 80 mesh stainless steel screen. The -80 mesh sample fraction is then weighed and analyzed. If a soil sample contains an excess of pebbles <u>or</u> is too small, then the entire sample must be pulverized to -200 mesh. This is the only way in which enough material may be found for analysis.

## GEOCHEMICAL ANALYSIS - AQUA REGIA DIGESTION

- Place 18 x 150 mm test tubes in aluminum digestion blocks.
- 2) Weigh 0.5 g of sample into test tubes.
- Intersperse samples with blanks, checks and certified reference materials.
- If samples are highly organic, dry ash in aluminum blocks on hot plates with hot plates set at 6-7 for 2-3 hours. Cool.
- Add 2 ml conc. HNO<sub>3</sub> and heat 40-45 minutes with hot plates set a 5. Cool.
- Transfer to wire racks but leave aluminum blocks on hot plates.
- 7) Add 3 ml conc. HCl. Let sit 15-25 minutes.
- 8) Add 2 ml H<sub>2</sub>O to the blanks.
- Place test tubes back in aluminum blocks, one row at a time watching for any samples that might have too violent a reaction.

If samples start to overflow, cool test tubes in a beaker of cold water and then place back in aluminum blocks.

- 10) Digest samples for 2 hours.
- 11) Add 1.0 ml of ammonium acetate solution to each tube and leave on a hot plate a further 15 minutes.
- Remove samples from aluminum blocks, transfer to wire racks and let cool.
- 13) Dilute to 10 ml with 1 N HNO3: vortex and allow to stand for 3 hours.
- 14) Read on A.A. against similarly prepared standards.

<u>NOTE</u>: Arsenic analysis by semi quantitative method, is run from the above solutions using a varian AA-5 spec. and recorder (if necessary to graph results.

#### FIRE ASSAYING

The following is a brief outline of the mechanics of fire assaying for gold and silver.

The ore is mixed with litharge (PBO) and various fluxed and a reducing agent or oxidizing agent is added, (flour or niter) to form a lead button which weighs between 25 and 35 grams. The whole mix is melted in a fire clay crucible at around 1000°c for 30-40 minutes. The lead collects all the gold, silver and precious metals. The molten assay is taken from the furnace and poured into cone shaped iron molds and due to the differences in the specific gravity of the lead and the slag, the lead collects in the bottom of the mold. When cooled the lead button is separated from the slag and hammered into a cube for ease of handling. The button is then placed in a pre-heated cupel in a furnace with the temperature set at around 900°c. A current of air passes over the top of the cupel containing the lead. The lead is converted back to litharge and is absorbed by the cupel.

Gold and silver are not affected and so remain in the cupel as a small bead. After cupellation is complete (about 60 minutes), the cupel is removed from the furnace. The small bead is then cleaned, flattened with a hammer and transferred to a parting cup. This flattened bead consists of a mixture of gold and silver.

The bead is weighed on a gold balance or micro balance. The bead is parted by placing it in hot, dilute nitric acid which dissolves all the silver but leaves the gold intact. The gold is washed free of silver nitrate by decantations with water and dilute ammonium hydroxide and then annealed at red heat and weighed as pure gold. The difference between the two weighings is the weight of silver.

The bead is weighed in milligrams and the results expressed in ounces per ton in the original sample.

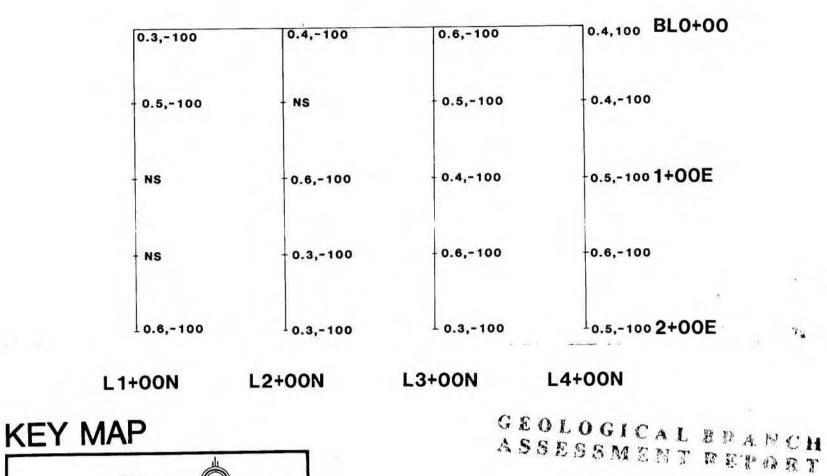
## METHOD FOR THE DETERMINATON OF GOLD BY FIRE ASSAY

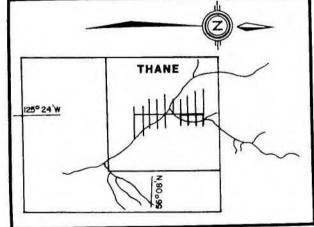
# PRECONCENTRATON AND ATOMIC ABSORPTION ANALYSES

- A 1 assay ton (29.166g) sample is weighed into a 30 g crucible, 1 mg of Ag is added as a collected agent.
- Enough flux reducing or oxidizing reagent is added to produce a lead button.
- 3. The sample is transferred into an assay furnace and heated to 2000°F for 40-45 minutes.
- 4. The fusion is poured into a iron mould.
- The slag is separated from the lead button in which Au and Ag has been alloyed.
- 6. The lead button is again transferred to a cupel in the assay furnace.
- By heating slightly below melting point of Ag, Lead is eliminated either by vaporizing or absorbing into the cupel in about 40 minutes.
- 8. A bead which contains all the Au in the 1 assay ton sample is recovered on the cupel.
- 9. The bead is transferred to a 16 x 150 mm test tube, 1 ml of concentrated HNO3, and 4 ml of 1:1 HCl are added to the tube.
- The tube is heated on the hot plate for approximately 1 hour, or until all the residue is dissolved in the tubes.

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- 11. The volume is adjusted to 10 ml with 1:1 HCl and the samples are mixed.
- 12. Samples are read on a Varian AA5 Atomic absorption spectrophotometer.





LEGEND

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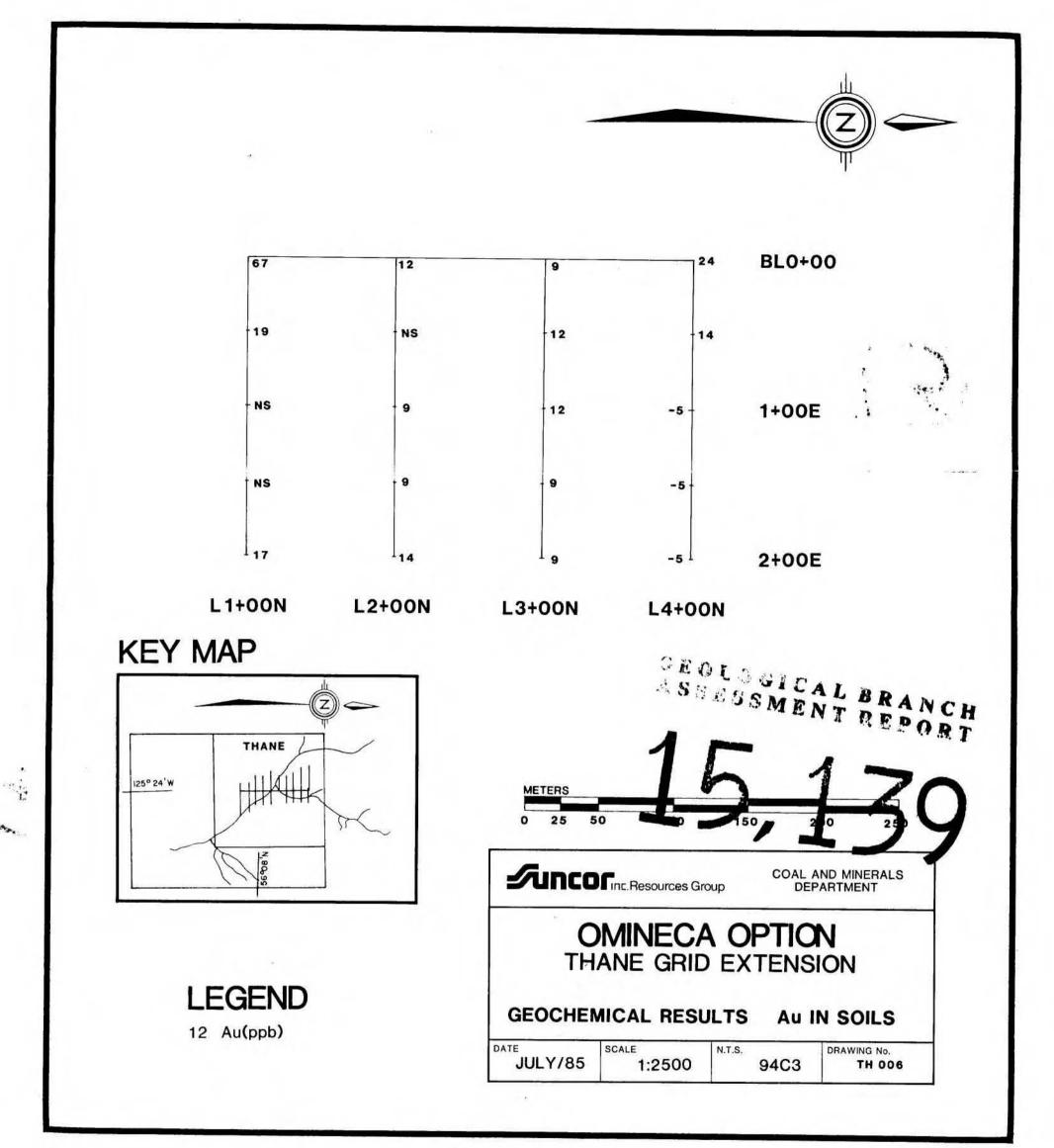
Ag(ppm)

As(ppm)

0.5

METERS 100 15 25 50 0 COAL AND MINERALS DEPARTMENT **OMINECA OPTION** THANE GRID EXTENSION GEOCHEMICAL RESULTS Ag & As IN SOILS DRAWING No. N.T.S. DATE SCALE 1:2500 94C3 TH 007 JULY/85







109,9,95 76,6,104 BLO+00 69,12,140 44,9,98

- 64,9,49	- NS	- 69,12,140	44,9,98	
NS	- 331,8,47	- 71,11,127	76,10,128	1+00E
NS	- 39,7,41	- 118,8,44	56,20,196	
77,12,87	72,8,98	27,7,36	53,9,234	2+00E

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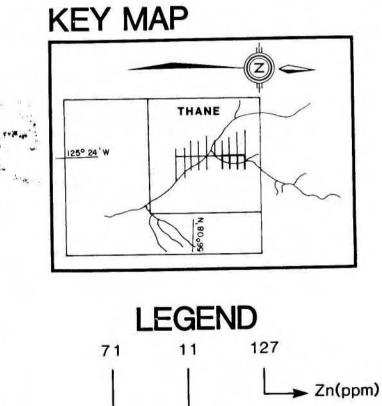
91,10,72

55,7,66

L2+00N

GEOLOGICAL BRANCH ASSESSMENT PEPORT METERS 100 200 50 150 25 0 COAL AND MINER **OMINECA OPTION** THANE GRID EXTENSION SOIL GEOCHEMICAL RESULTS Cu,Pb,Zn DRAWING No. N.T.S. SCALE DATE 94C3 TH 005 1:2500 JULY/85

L4+00N



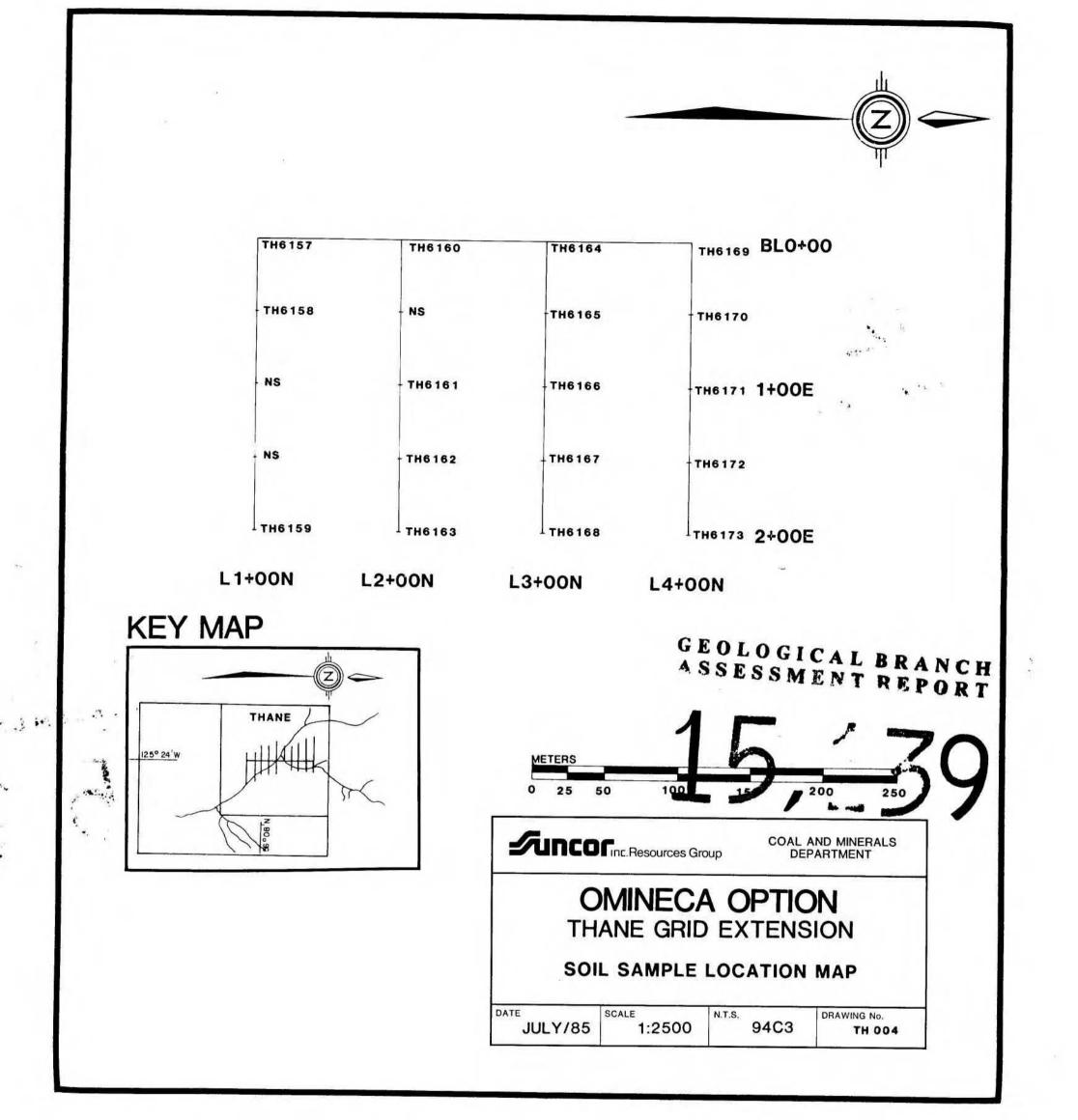
-> Cu(ppm)

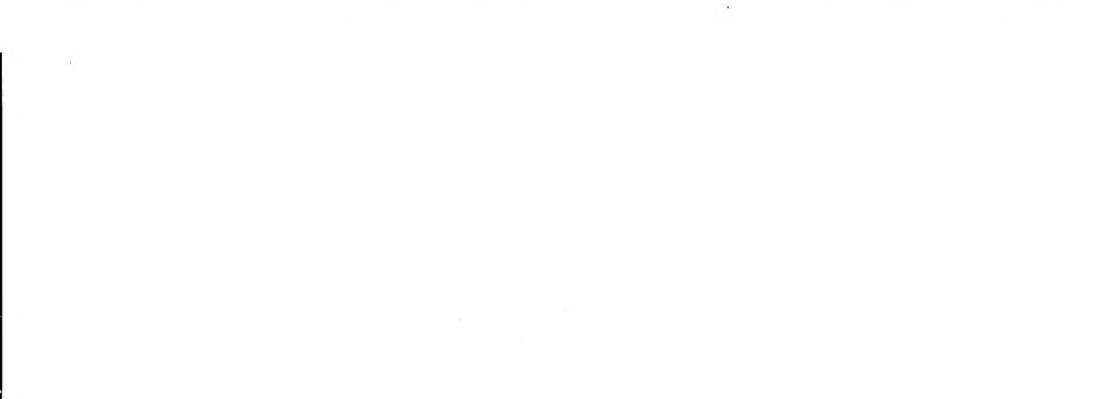
➤ Pb(ppm)

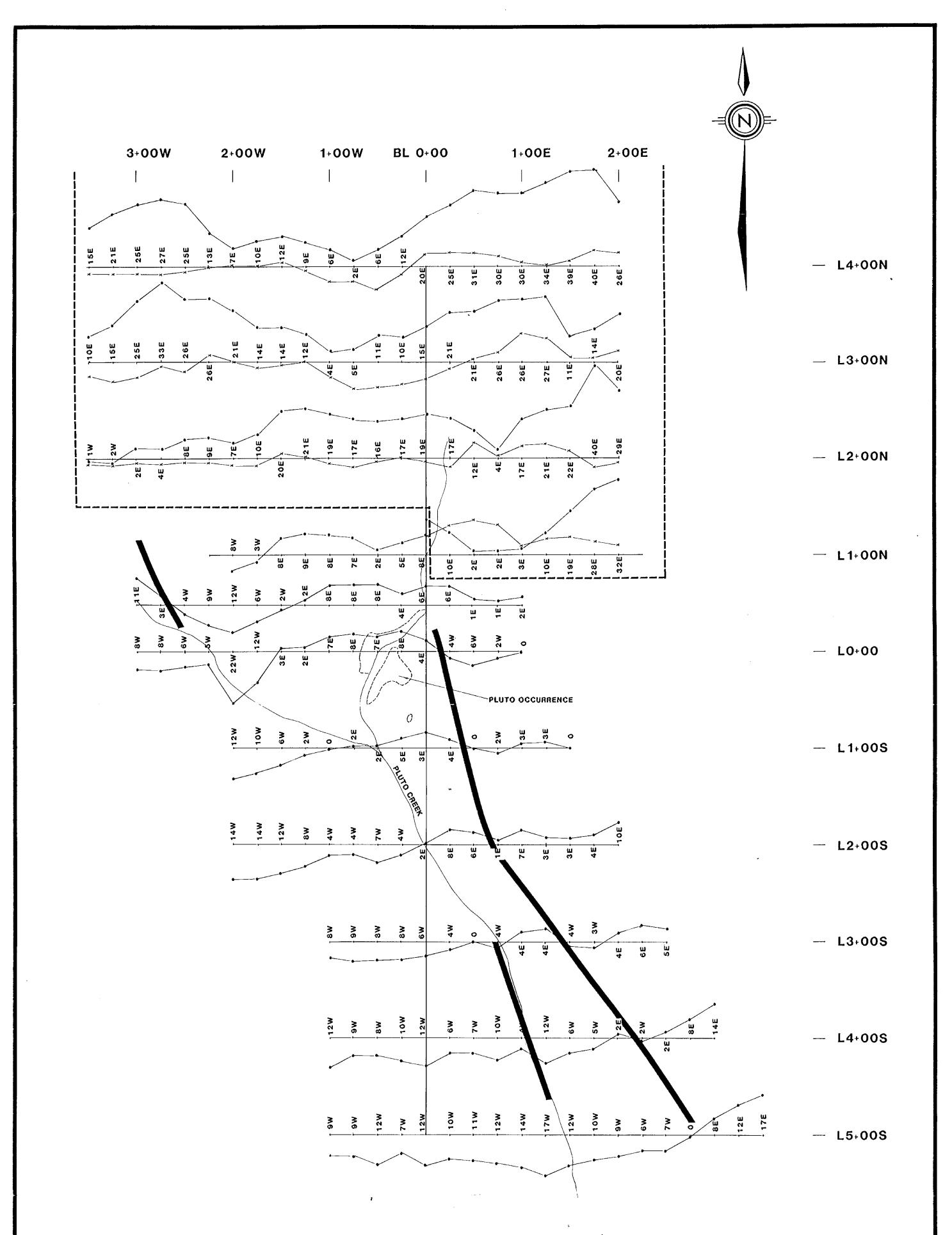
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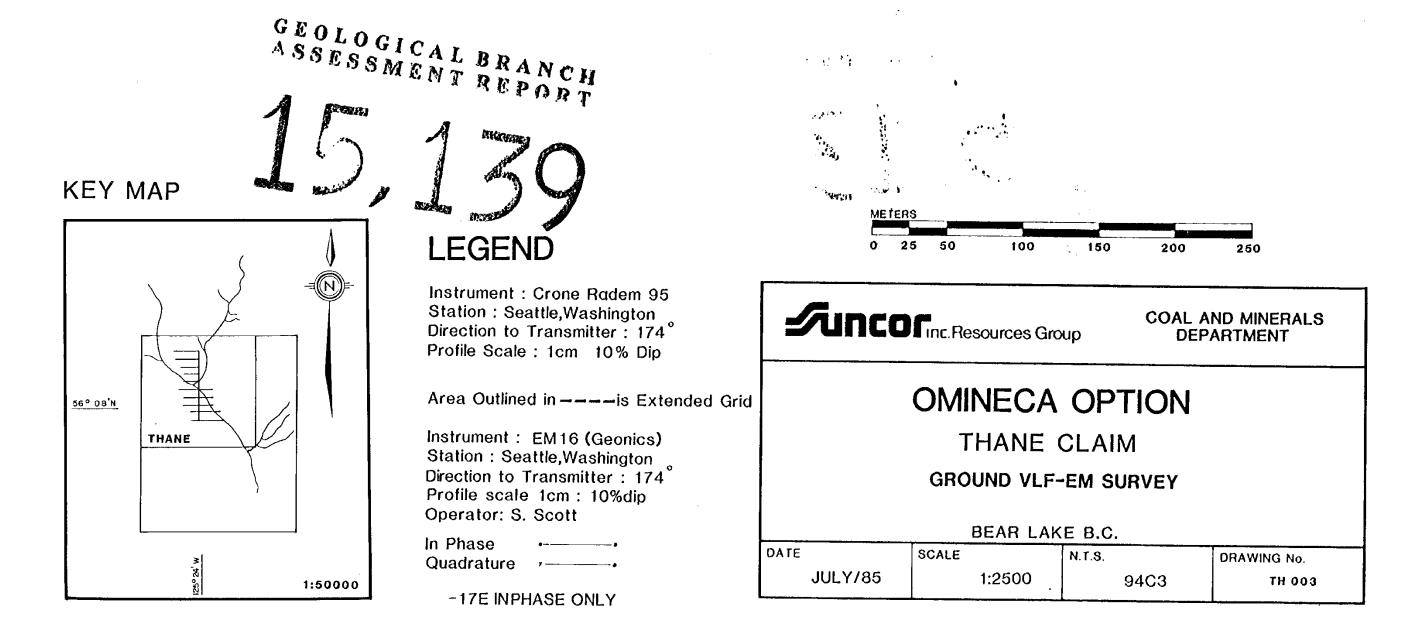
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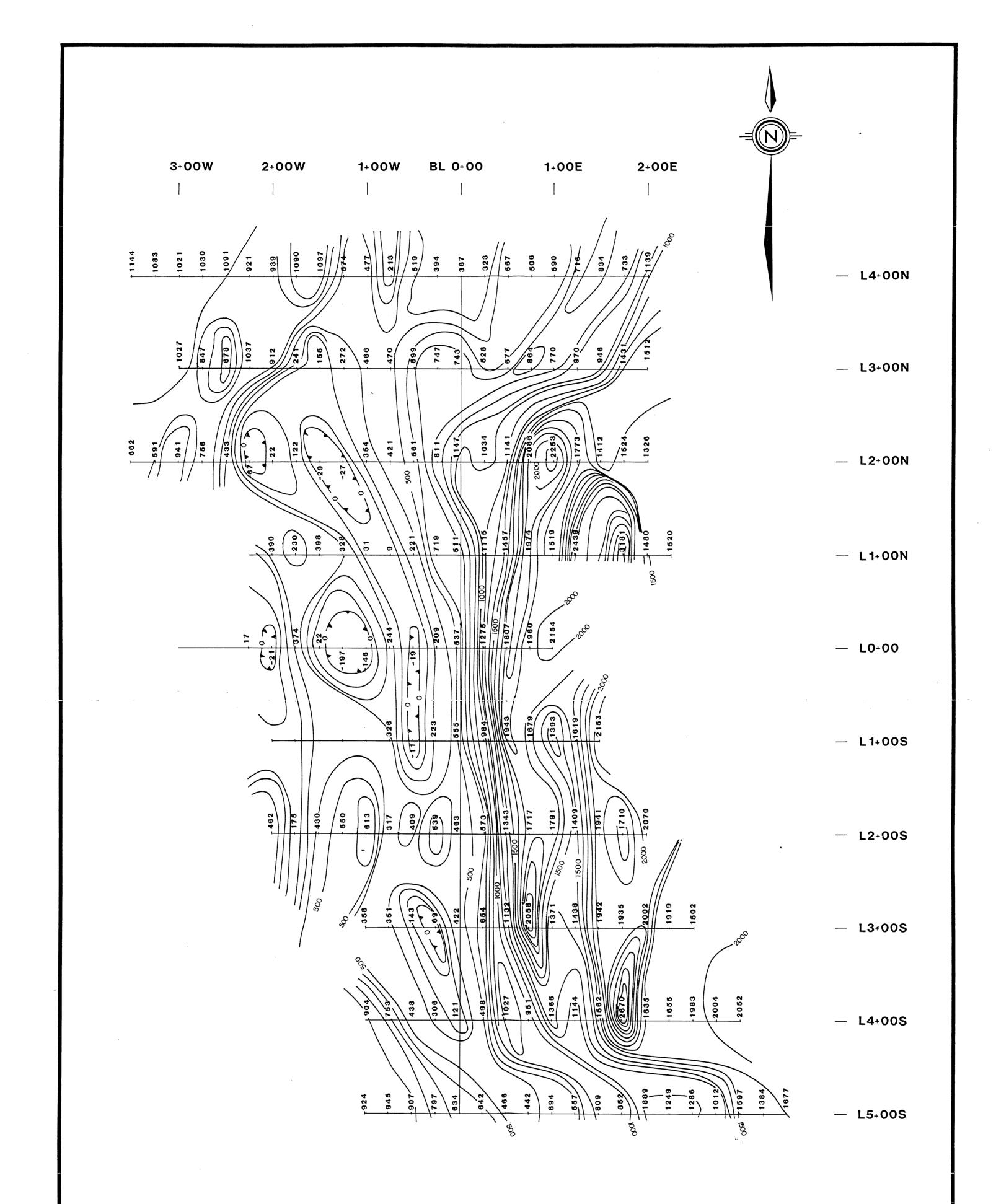






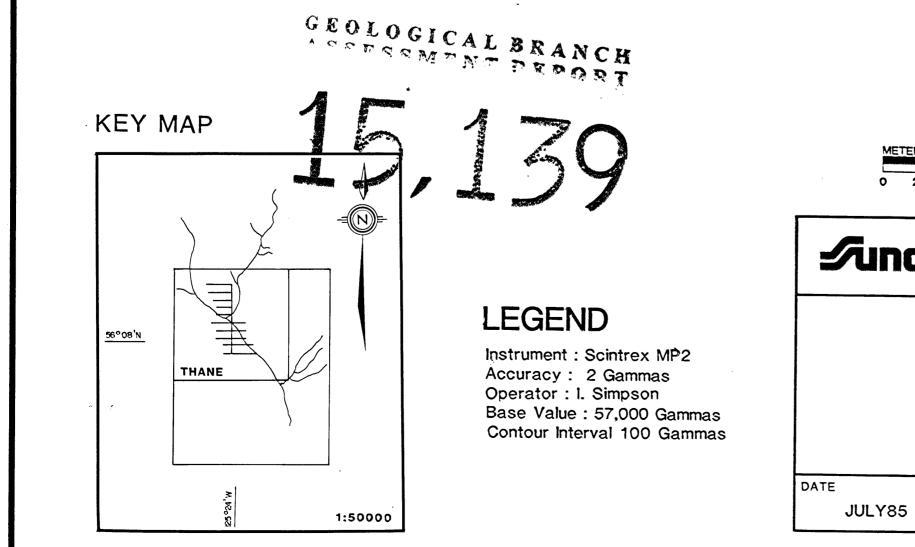


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