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## ASSESSMENT REPORT GEOLOGICAL AND GEOCHEMICAL SURVEY

#### TAN GROUP

**Atlin Mining Division** 

Tatsamenie Lake Area, B.C.

N.T.S. 104K/Tulsequah Sheet

58°10'N

132°18'W

104K-1W

## OWNER: CHEVRON MINERALS LTD. OPERATOR: CHEVRON CANADA RESOURCES LIMITED

Author: Godfrey Walton

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September 1985 GEOLOGICAL BRANCH ASSESSMENT RFPORT

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#### LOCATION AND ACCESS (Fig. 1)

The TAN group is situated 175 km south-southwest of Atlin, B.C. Its coordinates are 58°10'N, 132°18'W. The property is sparsely vegetated except the area close to the Samotua River. A Bell 206B Jet Ranger helicopter provided access to the claim group, flying from a base camp at Bearskin Lake roughly 1 km north of the TAN group.

#### CLAIMS

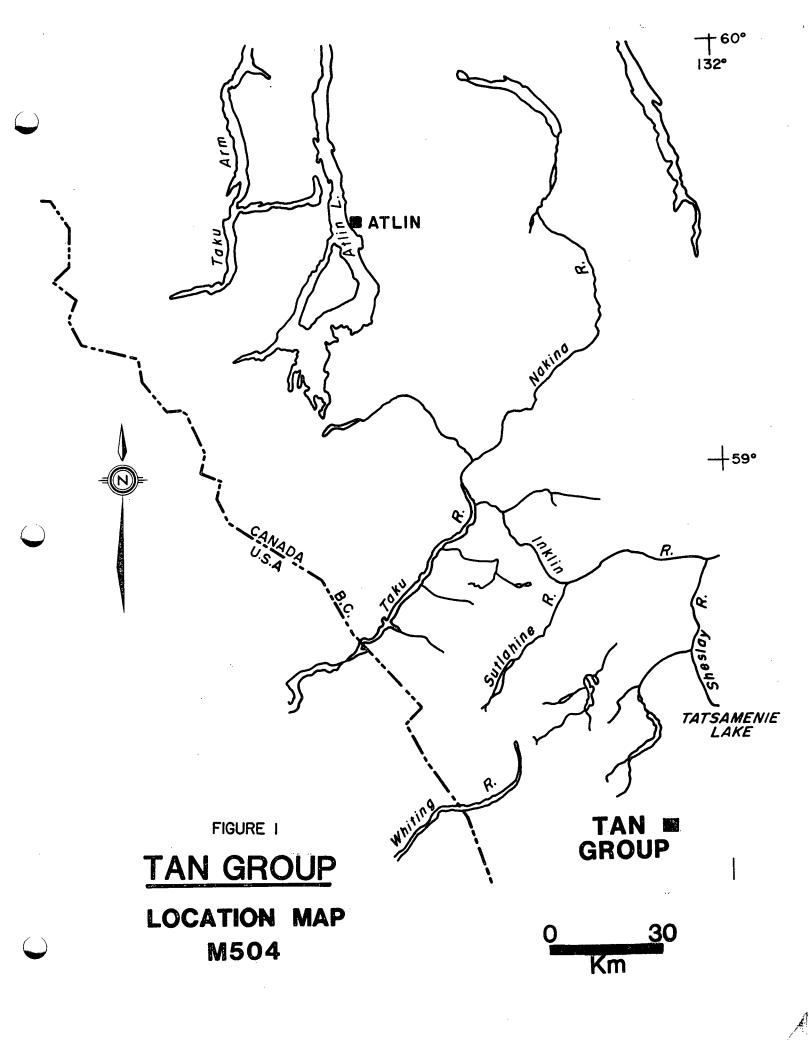
The TAN group was staked during June 1983 as follows:

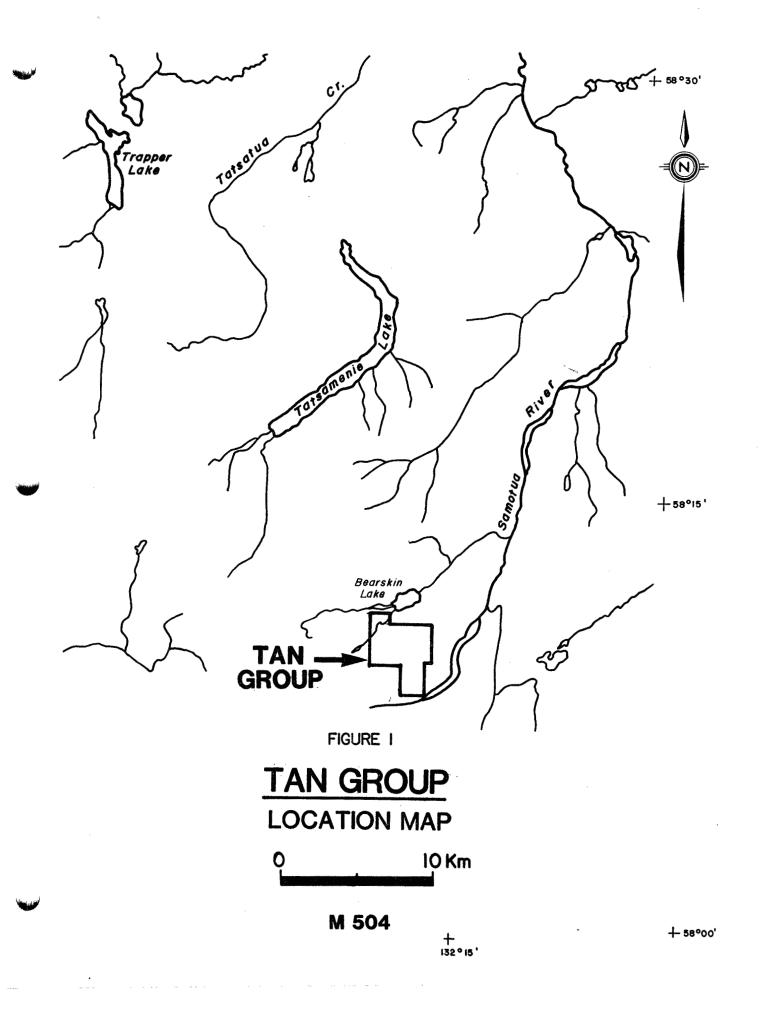
<u>Claim</u>	Record Number	Record Date	Number of Units
TAN 3	1939	July 4, 1983	20
TAN 4	1940	July 4, 1983	10
TAN 5	1941	July 4, 1983	12
TAN 6	1942	July 4, 1983	20
SUN I	1950	July 4, 1983	20

The TAN group surrounds the borders of ORO 1 and ORO 5-10 claims which were staked prior to the TAN group.

#### **REGIONAL GEOLOY**

The rocks in the area are Stikine Terrane, (Monger, 1975), Pre-Upper Triassic interlayered sediments and volcanics (Souther, 1971). High grade metamorphic basement rocks are possibly exposed southwest of Bearskin Lake.





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#### GEOLOGICAL SURVEY OF THE CLAIMS (Fig. 3)

This survey was completed in 1983 and filed in the assessment report (Gray, Walton, 1983). It is included here for completeness. Outcrop exposure is good throughout most of the TAN group. The TAN group is underlain by Stikine Terrane rocks which includes greenstone, augite porphyry, various tuffs, meta flows(?), phyllites, limy sediments and argillaceous shale. A reasonable section of the Stikine can be seen exposed in the cliffs in the northeast of TAN 3 and also the north-central part of TAN 4.

Jurassic(?), hornblende diorite intrusions cut the Stikine Terrane. These are relatively fresh plugs. South of Lonesome Lake the G.S.C. has mapped a high grade metamorphic basement. The rocks appeared to be gabbroic or a diabase rather than an amphibolite. Small zones of serpentinite are exposed at various locations on the claims.

#### Age Uncertain Gabbro(?)/Diabase - Unit I

The G.S.C. has mapped this unit as basement metamorphic rocks, but the rocks seen on the TAN group in that area appear to be mafic intrusives. Further work is necessary to carefully define the contacts and define the relationship between the basement metamorphic complex and the surrounding Stikine rocks.

#### Permian(?) Serpentinite – Unit 2

Only small slivers of serpentinite outcrop on the TAN group, often caught up between two lithological units indicating possible deep seated faults(?). The serpentinite weathers dark green to dark gray, and its fresh surface is medium to dark gray.

#### Pre-Upper Triassic Stikine Terrane – Units 3 to 7

The Stikine Terrane rocks on the TAN group are a volcanic sequence with some interlayered sediments. In the west half of the claims, Stikine rocks strike north-south and dip steeply to the west, whereas, in the eastern half they strike roughly east-west and dip moderately to the north.

Argillaceous black shale occurs as thin beds 1 m to 4 m thick. The shale is very recessive and forms saddles on the ridges.

The foliated augite porphyry is found in the west part of the claims. The porphyry is a sheeny dark green and has a porphroblastic texture. Certain layers have vesicular basalt fragments of varying size, but all appear to have a similar gross orientation. The augite porphyry has all been chloritized and is locally serpentinized (see Fig. 3).

The limy sediments are in the northeast corner of the claims. The beds are .5 to 2.5 m thick, weather medium gray to dirty brown, and exhibit compositional layering. The sediments are composed of 5% crinoid stems, 35% sand to pebble size rock fragments, and 60% gray carbonate matrix.

On the upper contact of the limy beds, fragments and blocks of a metavolcanic flow are in the sediments.

The meta-flows(?) are thin, .5 m to 2 m, layers of dark gray to slightly purple basalt(?). They are located in the northeast area of the TAN group and are between younger tuffs and older greenstone. Various tuffs are intercalated with the greenstone. Most are light green lithic lapilli tuffs. The others are crystal tuffs (mainly augite and olivine) and green-gray ash tuffs.

A large thickness of the volcanic sequence of the TAN group is medium green, nondescript greenstone. Layering is seen where chloritization intensity varies from layer to layer.

The dacite(?) feldspar porphyry is in the central part of SUN 1. The porphyry weathers dark green to gray, and is medium gray feldspar on its fresh surface. The white-light gray feldspars are .5 to 2 cm long and comprise 30% of the rock.

#### Jurassice Hornblende Diorite – Unit 8

Two relatively fresh medium grained hornblende diorite plugs intrude the volcanic sequence on the TAN group. They generally weather dark gray, and have a dark gray to black fresh surface. The composition varies somewhat from an intermediate to mafic intrusion but is generally dioritic. The diorite contacts observed with the Stikine rocks show no signs of contact metamorphism.

#### **MINERALIZATION AND ALTERATION**

The Stikine Terrane is quartz-iron carbonate altered by veins in small areas, but is otherwise unaltered beyond moderate chloritization. The northern diorite plug on TAN 4 has a number of carbonate veins 5 cm to 35 cm wide with pyrite (1%) and chalcopyrite (2%). This causes the diorite to weather a reddish-orange.

#### GEOCHEMICAL SURVEY OF CLAIMS

A total of 360 soil samples were collected from the SUN 1 and TAN 5 claims. These samples were collected early in the season before a lot of the snow had disappeared from the top and slopes of the mountain. The samples were collected on a 50 meter spacing along elevation contour lines. The soil is generally poorly developed or talus fines. The typical depth to the B horizon soil was 5 to 25 centimeters.

The samples were placed in Kraft sample bags, air dried in camp and shipped to Chemex laboratories in North Vancouver. They were prepared and analyzed by the methods outlined in Appendix A. All samples were analyzed for gold, silver, arsenic and antimony. The majority of samples had background values of gold (5 ppb), silver (0.1 ppm), arsenic (15 ppm), and antimony (1 ppm).

There were 6 samples with values greater than 50 ppb gold which were considered anomalous. The best area was on TAN 5 where there are 4 samples which had gold values of 220 ppb, 170 ppb, 160 ppb and 160 ppb. A follow up of these values provided no reason for the anomalous values.

#### VLF GEOPOHYSICAL SURVY OF CLAIMS

#### Principals of Operation

An EM-16 is a sensitive receiver covering the frequency band of VLF-transmitting stations with means of measuring the vertical field components. The receiver has two inputs, with two receiving coils built into the instrument. One coil has a vertical axis and the other has a horizontal axis. The signal from the vertical axis coil is first minimized by tilting the instrument, afterwards the remaining signal is balanced out by a measured percentage of a signal from the horizontal axis coil after being shifted by 90°. The horizontal field is normally parallel to the primary field. Thus, if the secondary signals are small compared to the primary horizontal field, the mechanical tilt angle is an accurate measure of the vertical real-component, and the compensation P/2 signal from the horizontal coil is a measure of the quadrature vertical signal (Geonics Operating Manual).

The magnetic field lines are always at right angles to the direction of that station. Therefore, the best signal is obtained by selecting a station approximately on strike with the structure that one is expecting. In this case northerly to northwesterly structures are expected so a station (Seattle) was selected which has a southeasterly bearing from the propery.

#### **GEOPHYSICAL RESULTS AND GRID CONTROL**

A VLF-EM survey was carried out on a slope corrected grid established on top of the mountain. The top of the mountain is an old peneplain which is commonly around 6000 feet in the district. A glacier in the central portion of the grid resulted in the grid being U-shaped. The lines were 100 meters apart and readings were taken every 12.5 meters along the lines.

The in phase values from the VLF survey have all been Fraser filtered, to assist the identifying of conductors. The Fraser filtering causes any cross overs which occur over conductors to appear as peaks while all other data appears as low positive or negative values. Figure 7 displays the contoured Fraser filtered values which outline the conductors. Most of the conductors correlated with known structures which have been identified from airphotograph lineaments. The VLF profiles help in correlating structures which have similar, in phase and Fraser filter responds across lines.

There are two main areas which have strong conductors. One of them could be correlated with a structure on the north side of Bearskin Lake; however, there is no concrete evidence because there is no VLF coverage between the two areas. The correlation is based on the similar Fraser filter values and the projected location of the structure from the north side of Bearskin Lake. The other area is a zone that has numerous conductors which have low Fraser filter values (typically 5-10 units).

#### CONCLUSIONS AND RECOMMENDATION

There are only a few anomalous gold soil samples which cannot be correlated to any surface mineralization. The VLF coverage confirms the presence of conductors which can be correlated with faults and airphotograph lineaments.

Future work should include rock sampling of the conductors and structures outlined by the VLF-EM survey.

#### REFERENCES

Souther, J. G. (1971). Geology and Mineral Deposits of Tulsequah map-area, British Columbia, Geological Survey of Canada, Memoir 362, 84p.

Monger, J.W.H. (1975). Upper Paleozoic Rocks of the Atlin Terrane, Northwestern British Columbia and South-Central Yukon, Geological Survey of Canada, Paper 74-47.

Gray, M; Walton, G. (1983). Assessment report, Geological and Geochemical Survey, TAN Group, 9p.

Geonics Limited (1979). EM-16 Operating Manuel

# STATEMENT OF COSTS

### LABOUR

		<b>Field Days</b>	Office Days
G. Walton	Geologist/Supervisor	2.0	5
W. Hewgill	Geologist	11.5	
T. Zanger	Geophysical Assistant	<u>9.5</u>	-
		22	5
Average cost per fie	eld day \$150 x 22		\$ 3,300.00
Average cost per off	fice day \$250 x 5		1,250.00
<u>Camp Cost</u> 22 man days @\$50/m <u>Analysis</u>	nan day		1,100.00
360 soil samples @\$1	6.20		5,832.00
Helicopter			
3 hrs @\$430.			1,290.00
Drafting			
5 man days @\$200/d	ay		1,000.00
			\$13,772.00

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#### STATEMENT OF QUALIFICATIONS

I, Godfrey Walton, have worked as a geologist since 1973 in Alberta, British Columbia, Yukon, Northwest Territories and Ontario. I graduated in 1974 with a B.Sc. (Hons) degree from the University of Alberta and was awarded a M.Sc degree from Queens University in January 1978. I have been employed by Chevron on a permanent basis since 1976.

I am a member in good standing with the Canadian Institute of Mining and Metallurgy, the Society of Exploration Geochemists and the Mineralogical Association of Canada.

The field work on the TAN Group was carried out under my supervision.

Godfrey Walt

**GODFREY WALTON** 

#### **APPENDIX A**

#### GEOCHEMICAL PREPARATION AND ANALYTICAL PROCEDURES

- Geochemical samples (soils, silts) are dried at 50°C for a period of 12 to 24 hours. The dried sample is sieved to -80 mesh fraction through a nylon and stainless steel sieve. Rock geochemical materials are crushed, dried and pulverized to -100 mesh.
- 2. A 1.00 gram portion of the sample is weighted into a calibrated test tube. The sample is digested using hot 70% HC104 and concentrated HN03. Digestion time = 2 hours.
- 3. Sample volume is adjusted to 25 mls. using demineralized water. Sample solutions are homogenized and allowed to settle before being analyzed by atomic absorption procedures.
- 4. Detection limits using Techtron A.A.5 atomic absorption unit.

Copper	-	l ppm
Molybdenum	-	l ppm
Zinc	-	l ppm
*Silver	-	0 <b>.</b> 2 ppm
*Lead	-	l ppm
*Nickel	-	l ppm
Chromium	-	5 ppm

\*Ag, Pb & Ni are corrected for background absorption.

5. Elements present in concentrations below the detection limits are reported as one half the detection limit, i.e. Ag - 0.1 ppm.

a2/

#### PPM Antimony:

A 2.0 gm sample digested with conc. HCl in hot water bath. The iron is reduced to Fe  $^{+2}$  state and the Sb complexed with 1<sup>-</sup>. The complex is extracted with TOPO-MIBK and analyzed via A.A. Correcting for background absorption 0.2 ppm  $\pm$  0.2.

Detection limit: 0.2 ppm

#### **PPM Arsenic:**

A 1.0 gram sample is digested with a mixture of perchloric and nitric acid to strong fumes of perchloric acid. The digested solution is diluted to volume and mixed. An aliquot of the digest is acidified, reduced with KI and mixed. A portion of the reduced solution is converted to arsine with NaBH<sub>4</sub> and the arsenic content determined using flameless atomic absorption.

Detection limit: | ppm

#### PPM Tungsten:

0.50 gm sample is fused with potassium bisulfate and leached with hydrochloric acid. The reduced form of tungsten is complexed with toluene 3,4 dithiol and extracted into an organic phase. The resulting colour is visually compared to similarly prepared standards.

Detection limit: 2 ppm W

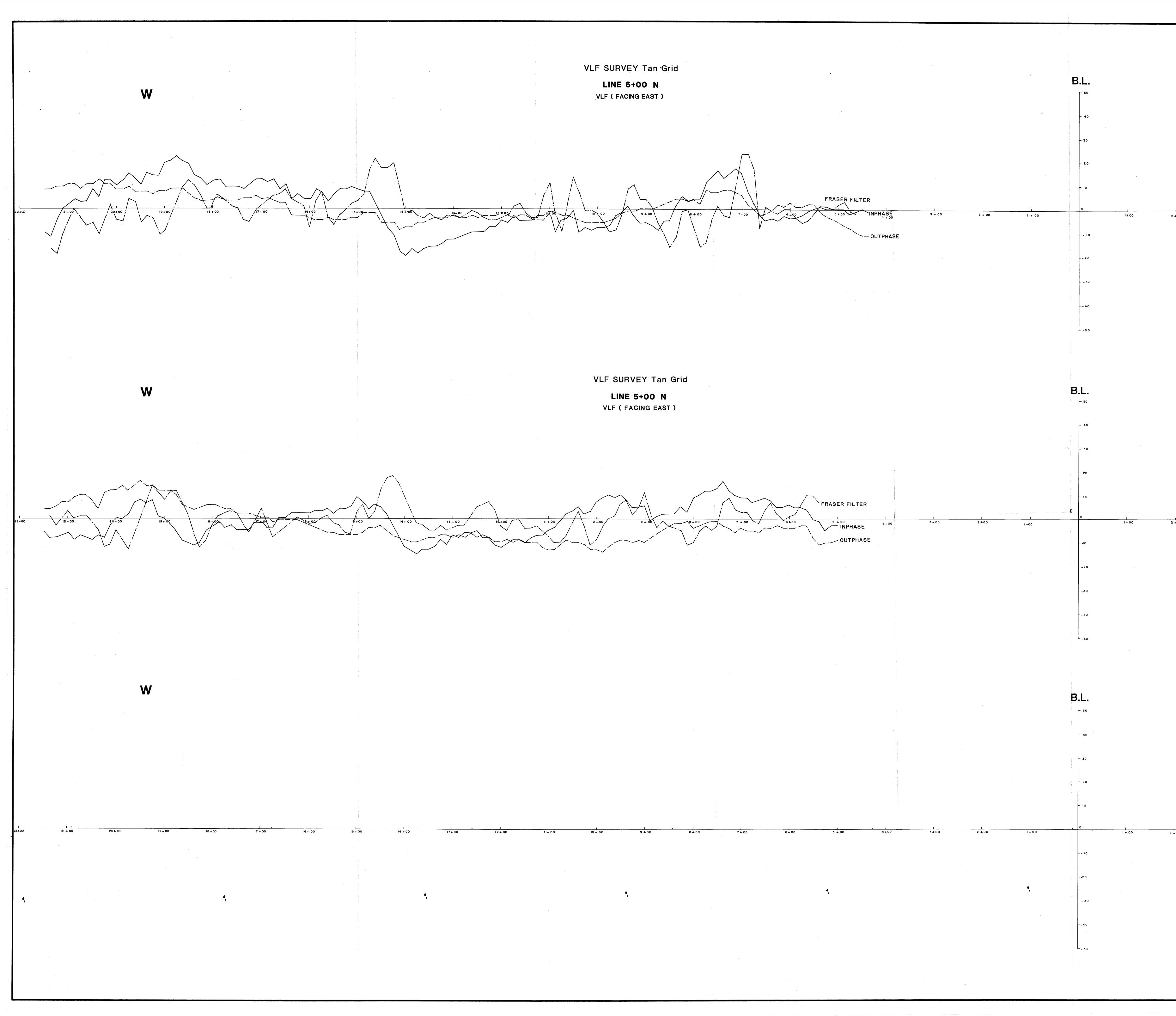
#### FIRE ASSAY METHOD - Silver & Gold

Silver and gold analyses are done by standard fire assay techniques. In the sample preparation stage the screens are checked for metallics which, if present, are assayed separately and calculated into the results obtained from the pulp assay.

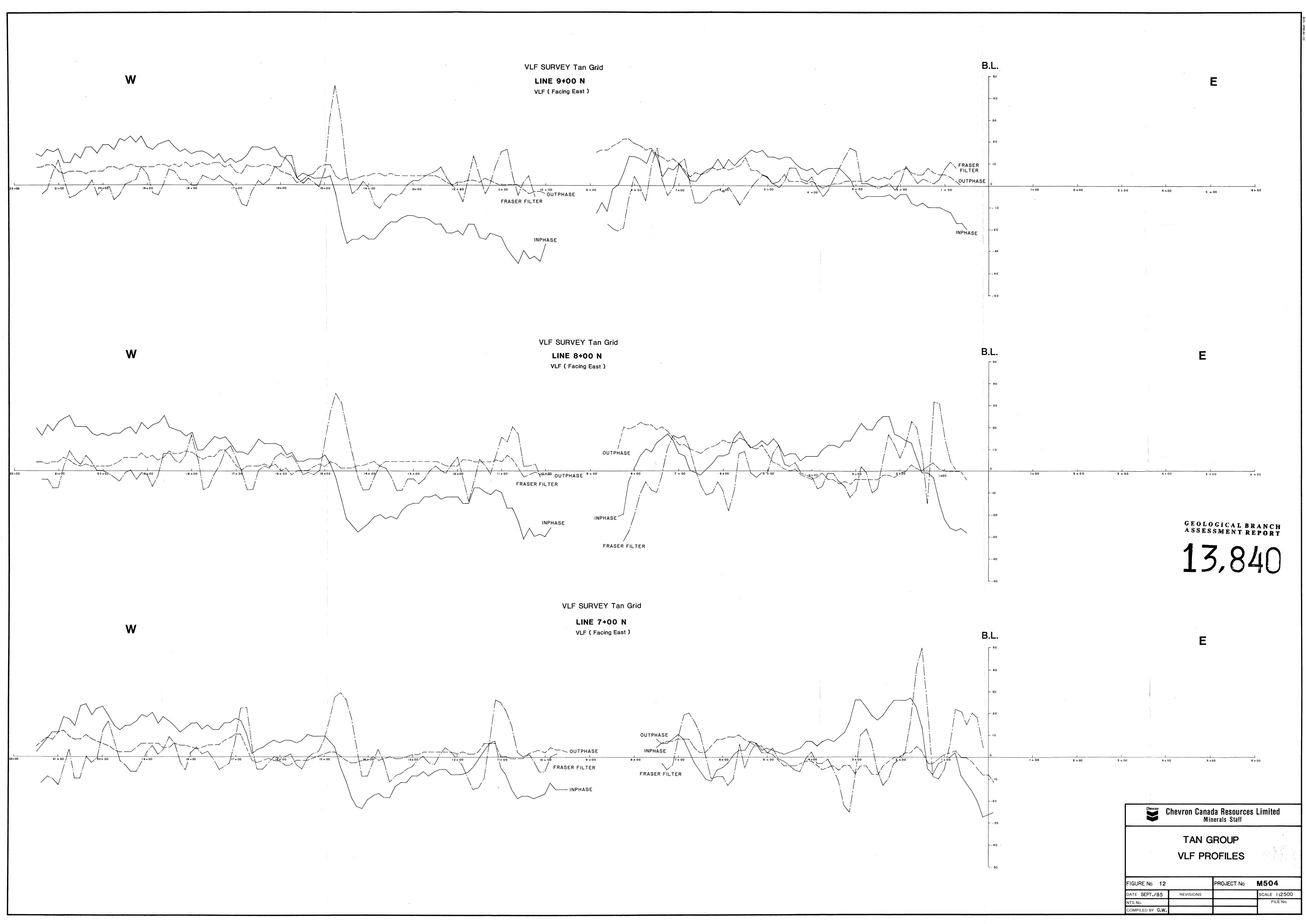
0.5 assay ton sub samples are fused in litharge, carbonate and siliceous fluxes. The lead button containing the precious metals is cupelled in a muffle furnace. The combined Ag & Au is weighed on a microbalance, parted, annealed and again weighed as Au. The difference in the two weighings is Ag.

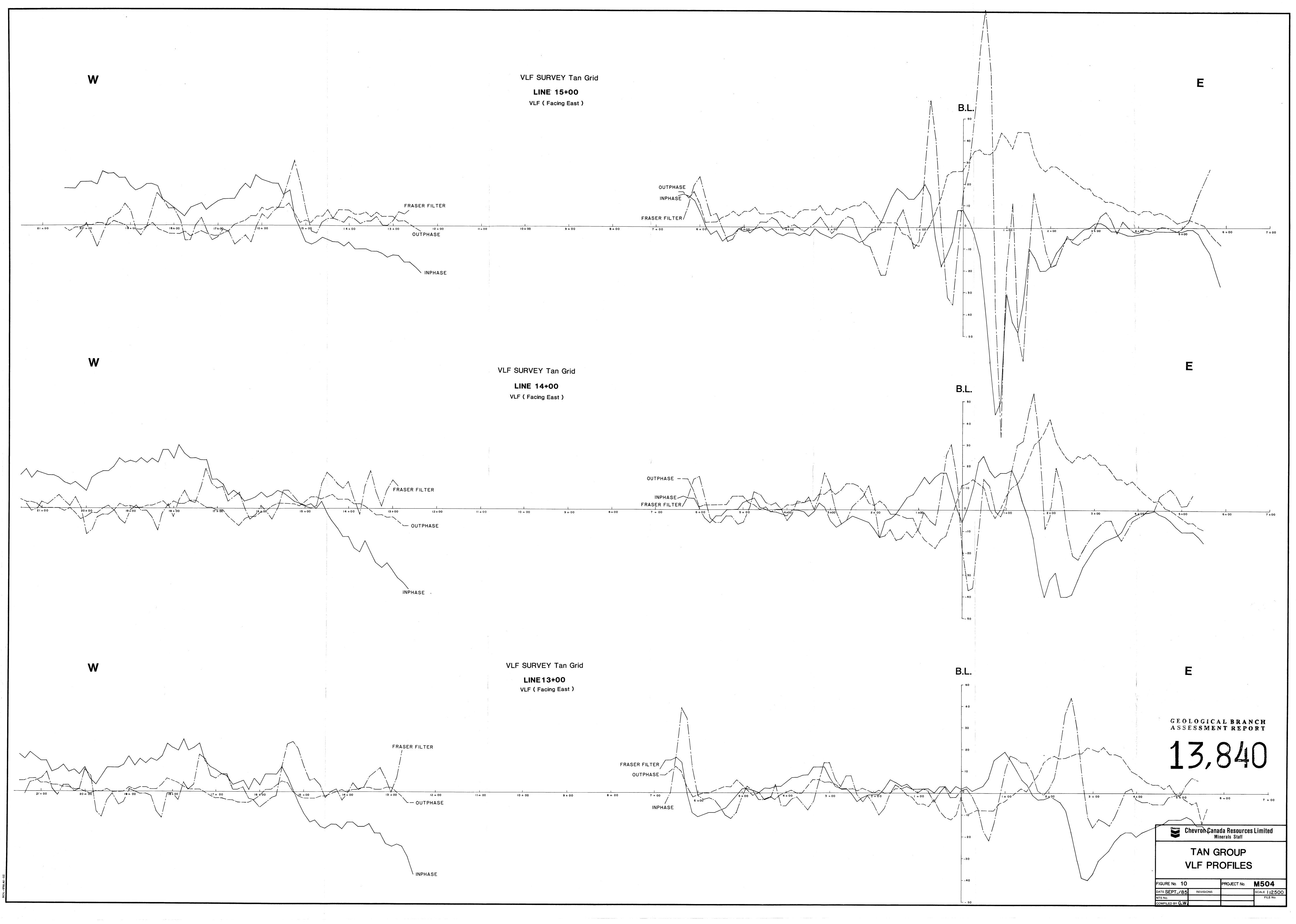
#### F.A. - A.A. GOLD COMBO METHOD

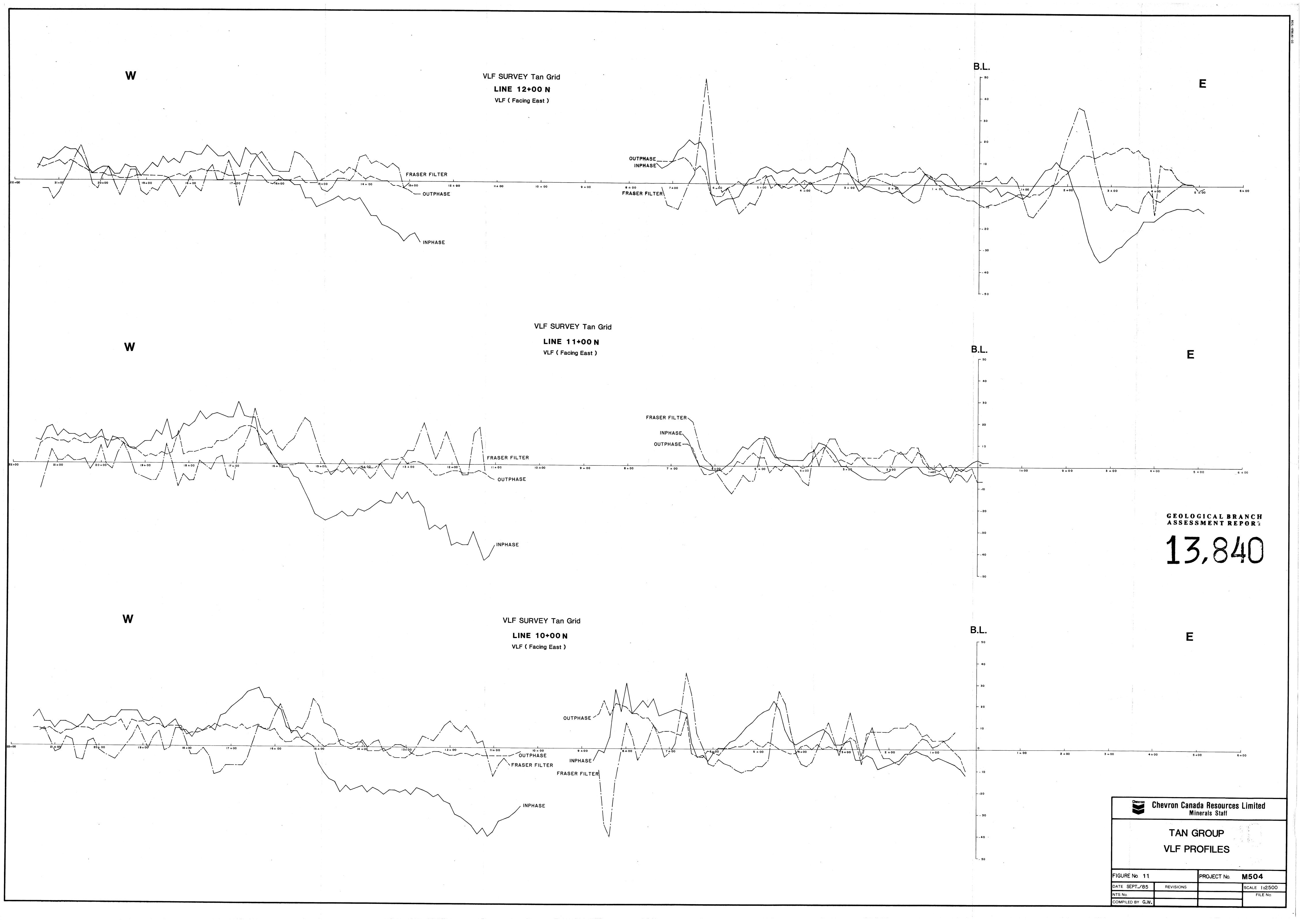
For low grade samples and geochemical materials 10 gram samples are fused with the addition of 10 mg of Au-free Ag metal and cupelled. The silver bead is parted with dilute HNO<sub>3</sub> and then treated with aqua regia. The salts are dissolved in dilute HC1 and analyzed for Au on an atomic absorption spectrophotometer to a detection of 5 ppb.

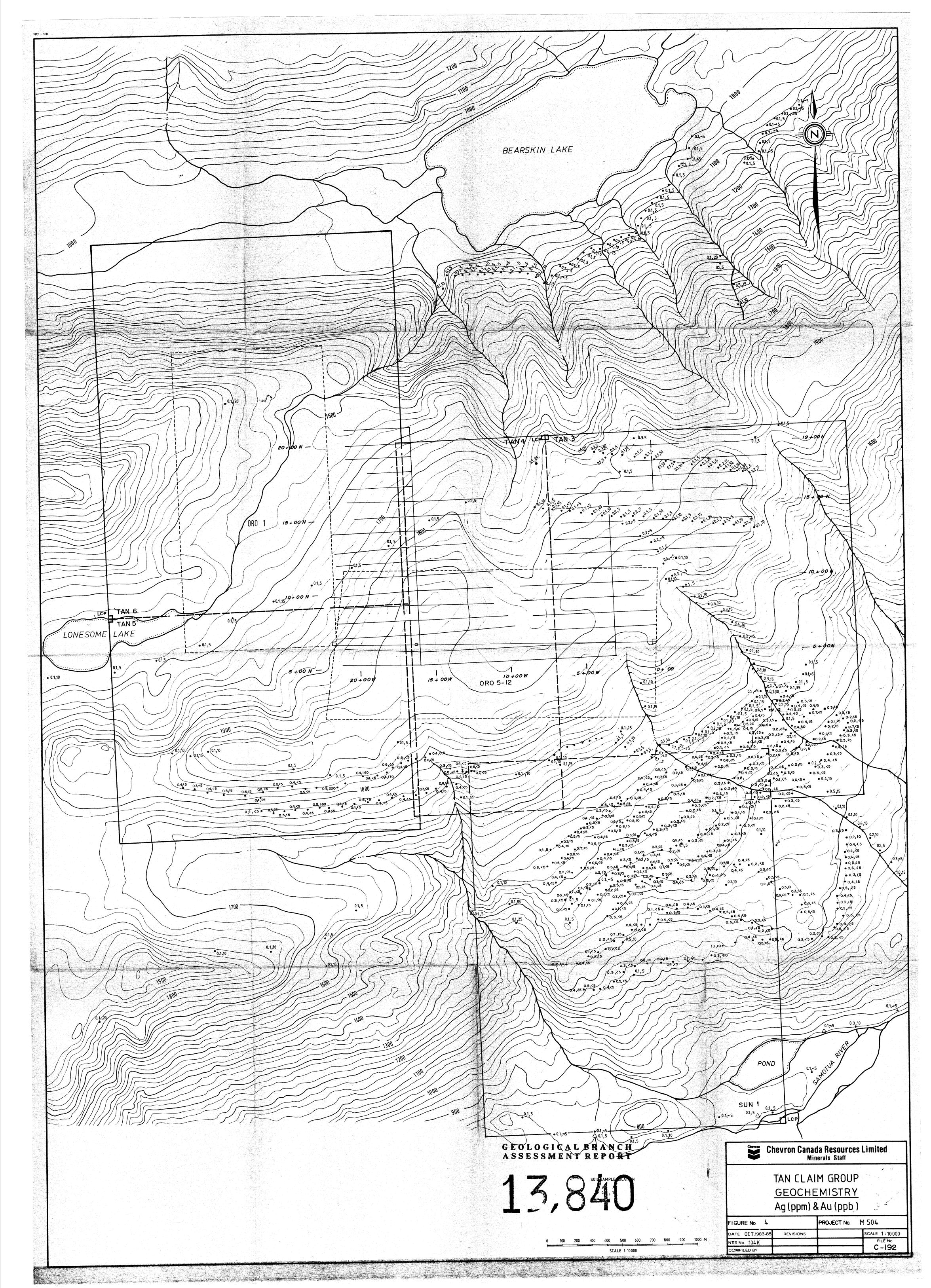


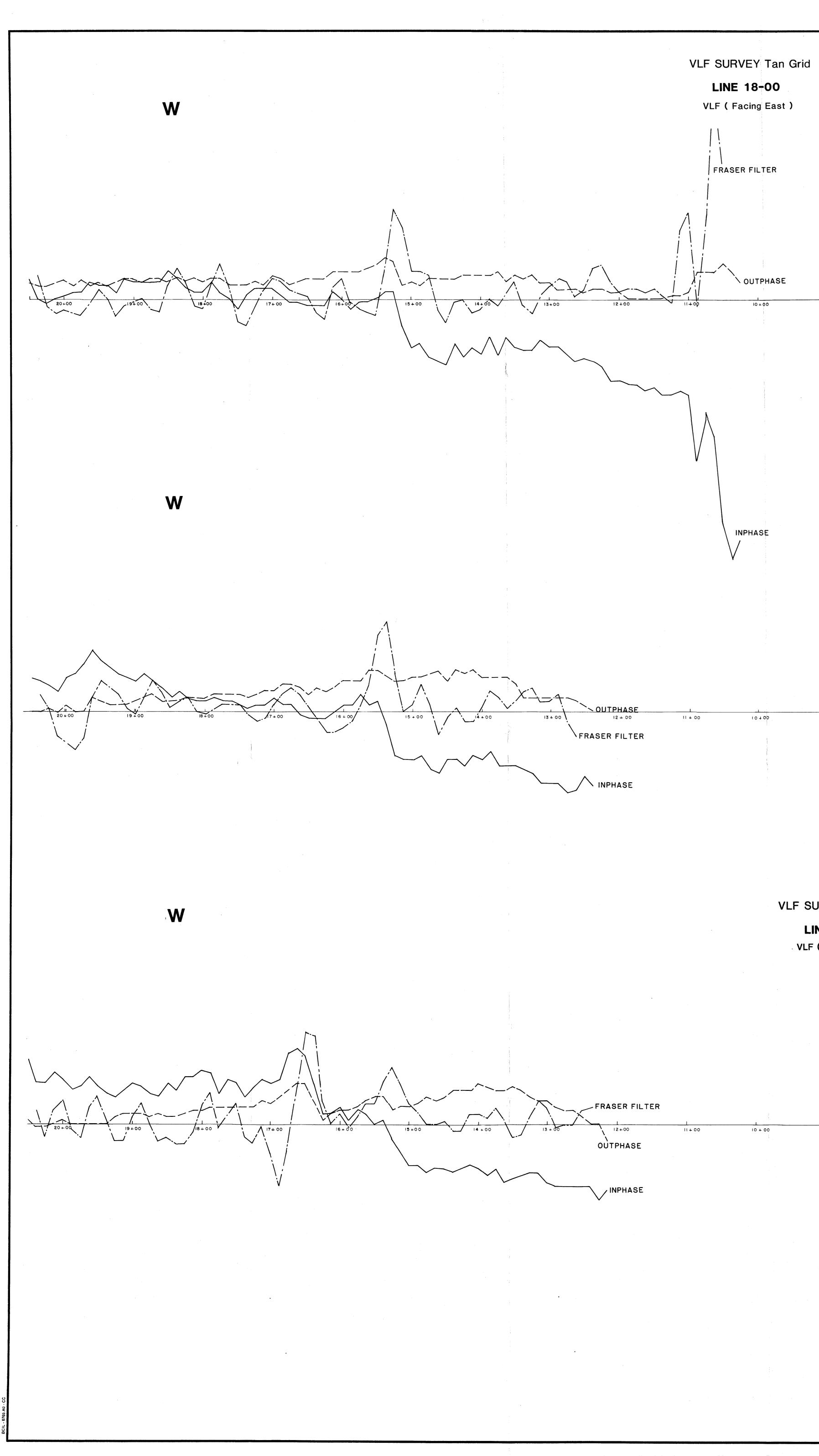
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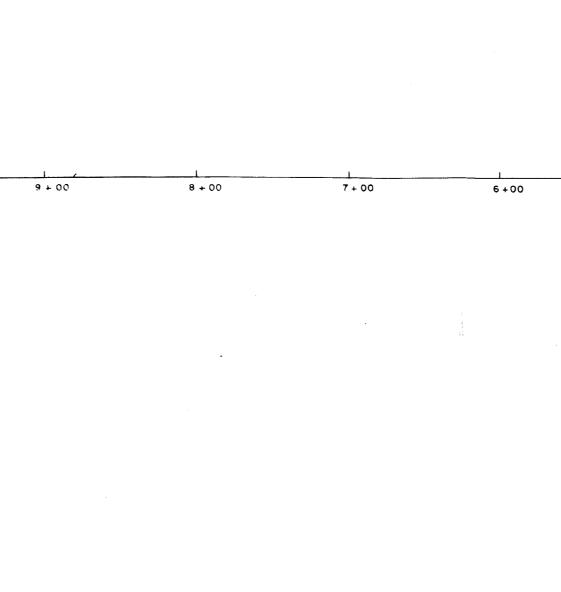












VLF SURVEY Tan Grid LINE17-00 VLF (Facing East)

9 + 00 6 + 00 8 + 00 7 + 00

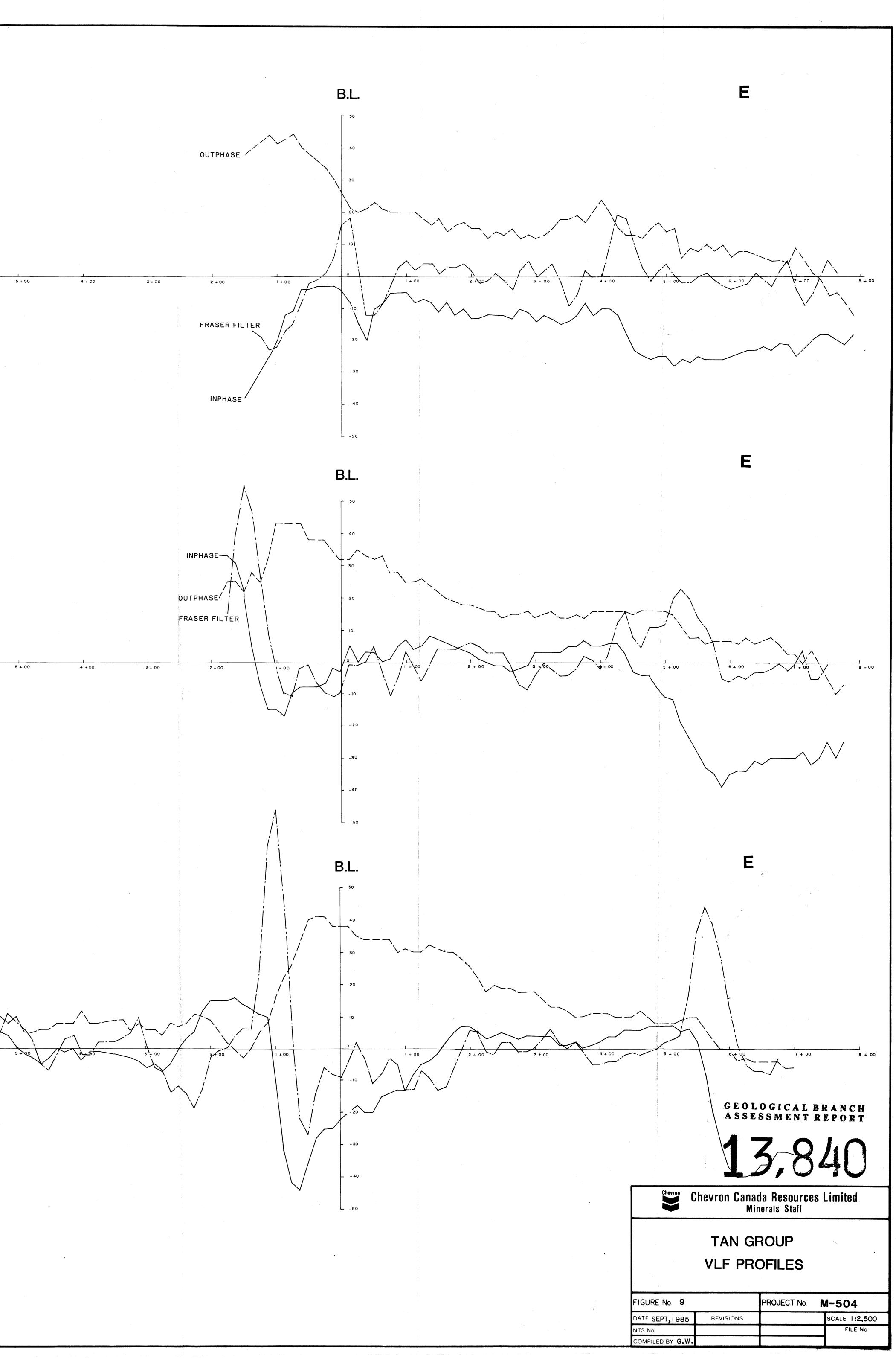
## VLF SURVEY Tan Grid

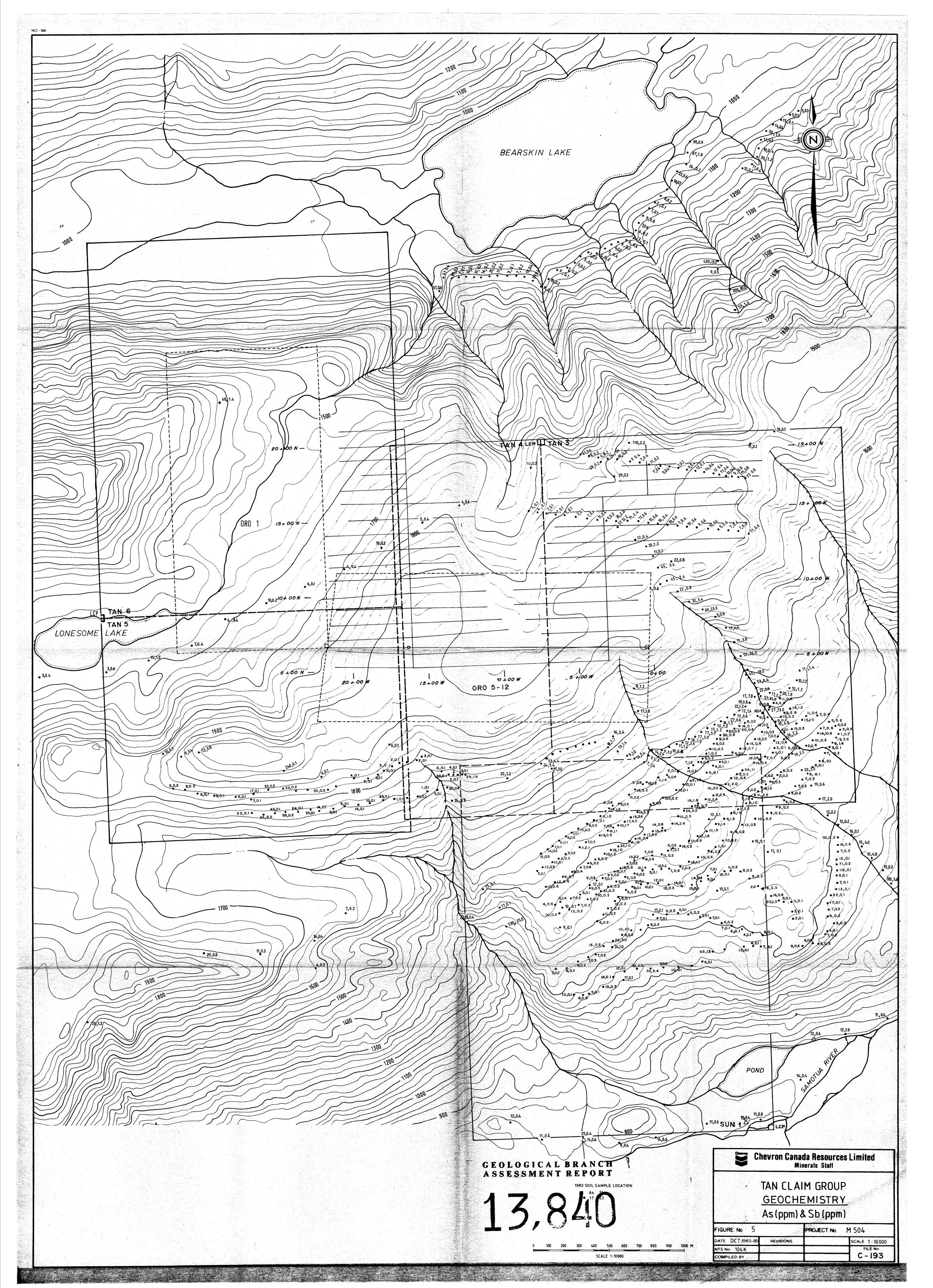
LINE 16-00 VLF (Facing East)

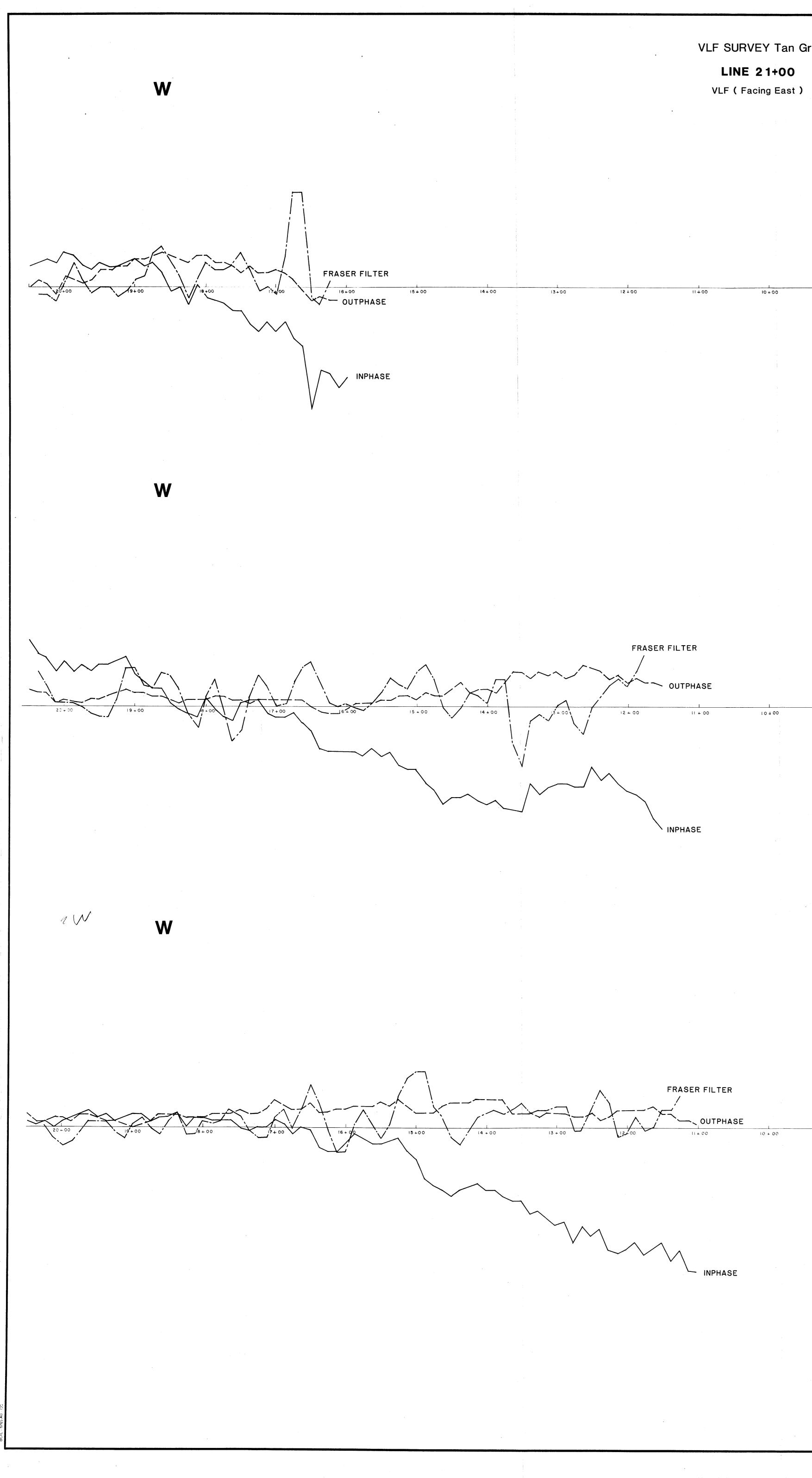
OUTPHASE INPHASE 9 + 00 8 + 00 6′+ 00 FRASER FILTER 7 + 00

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# VLF SURVEY Tan Grid LINE 21+00

9 + 00

8 + 00

10 + 00

10 + 00

9 + 00

VLF SURVEY Tan Grid LINE 20+00

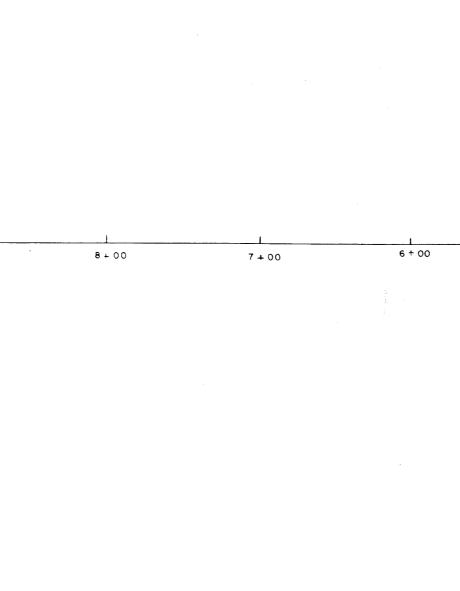
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7 + 00

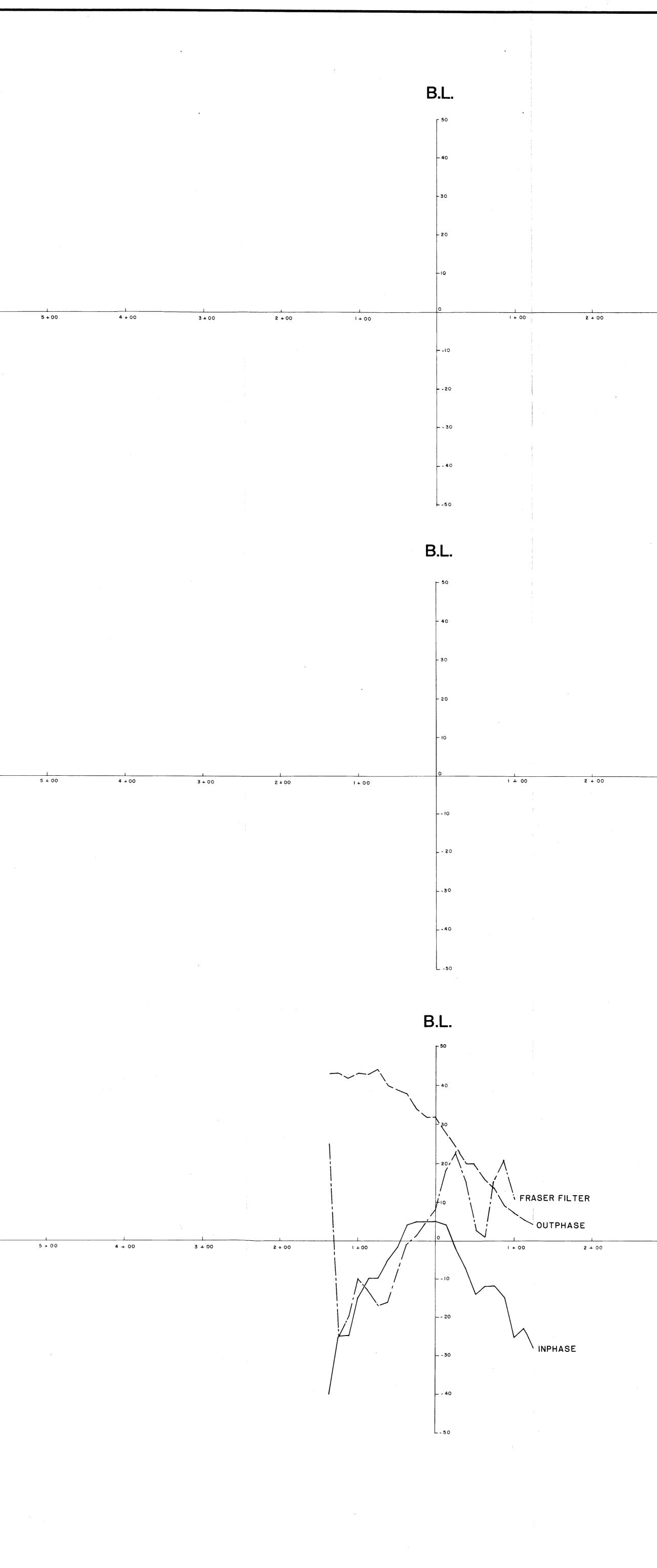
6+00

VLF (Facing East)

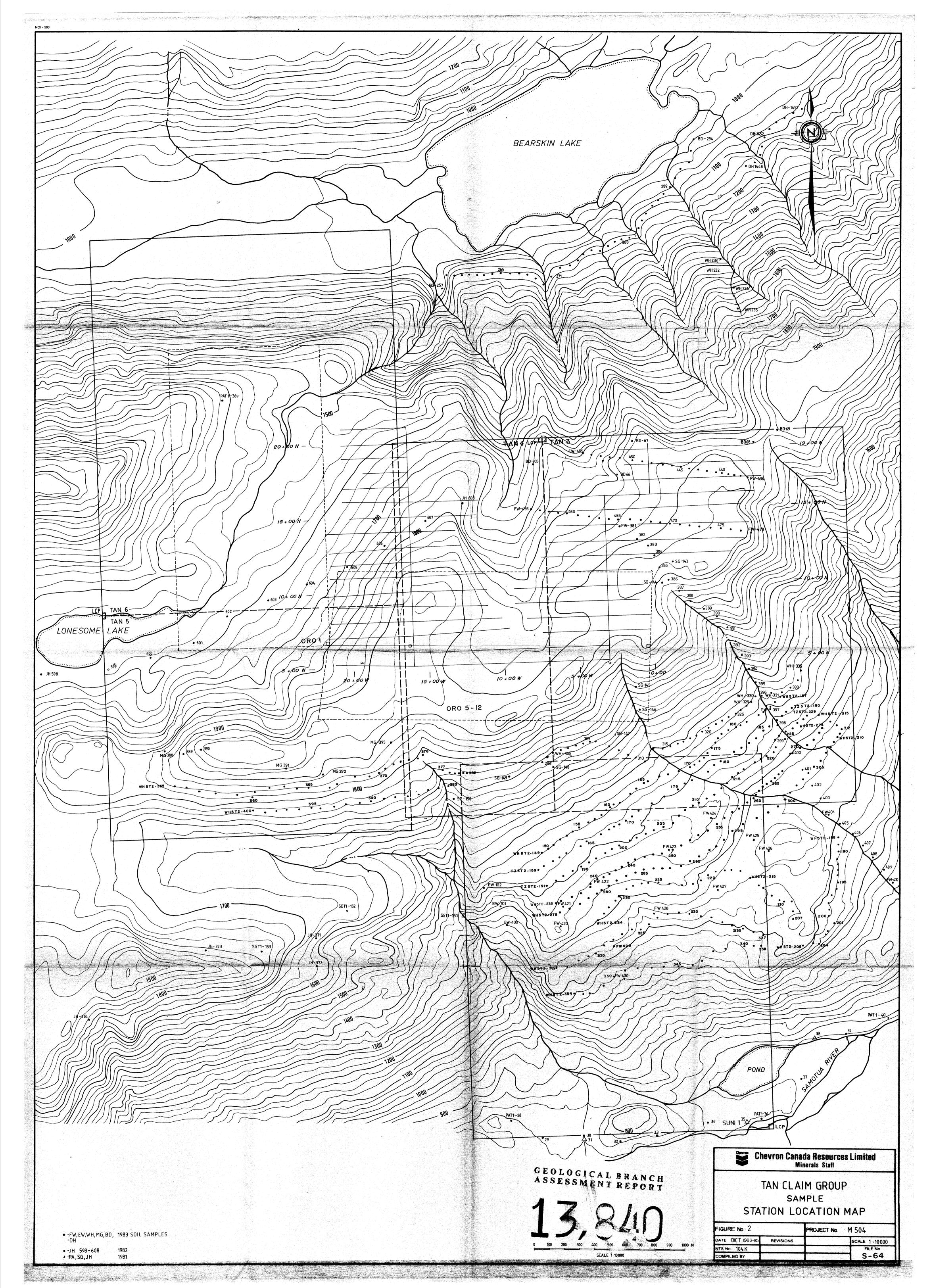


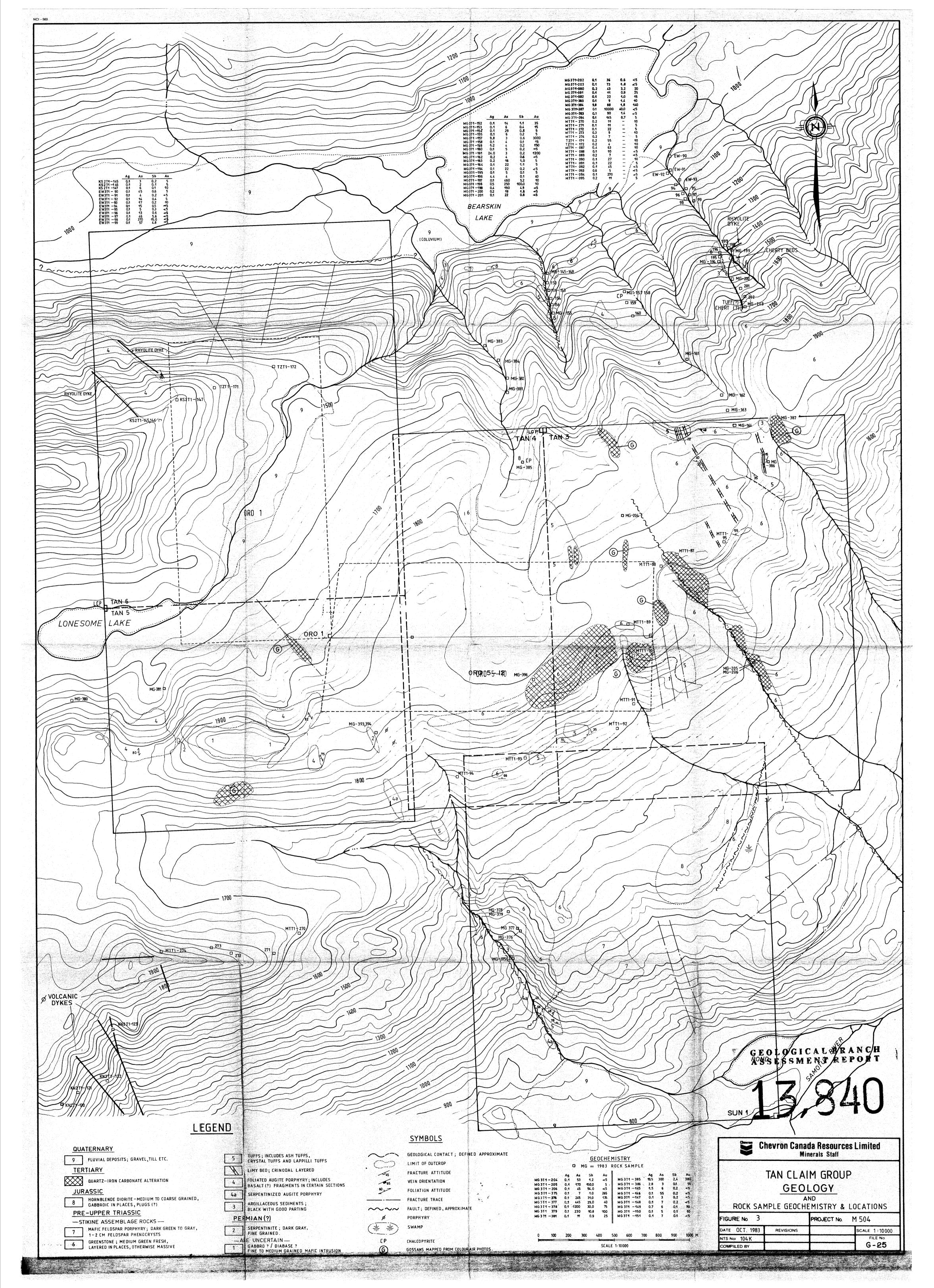
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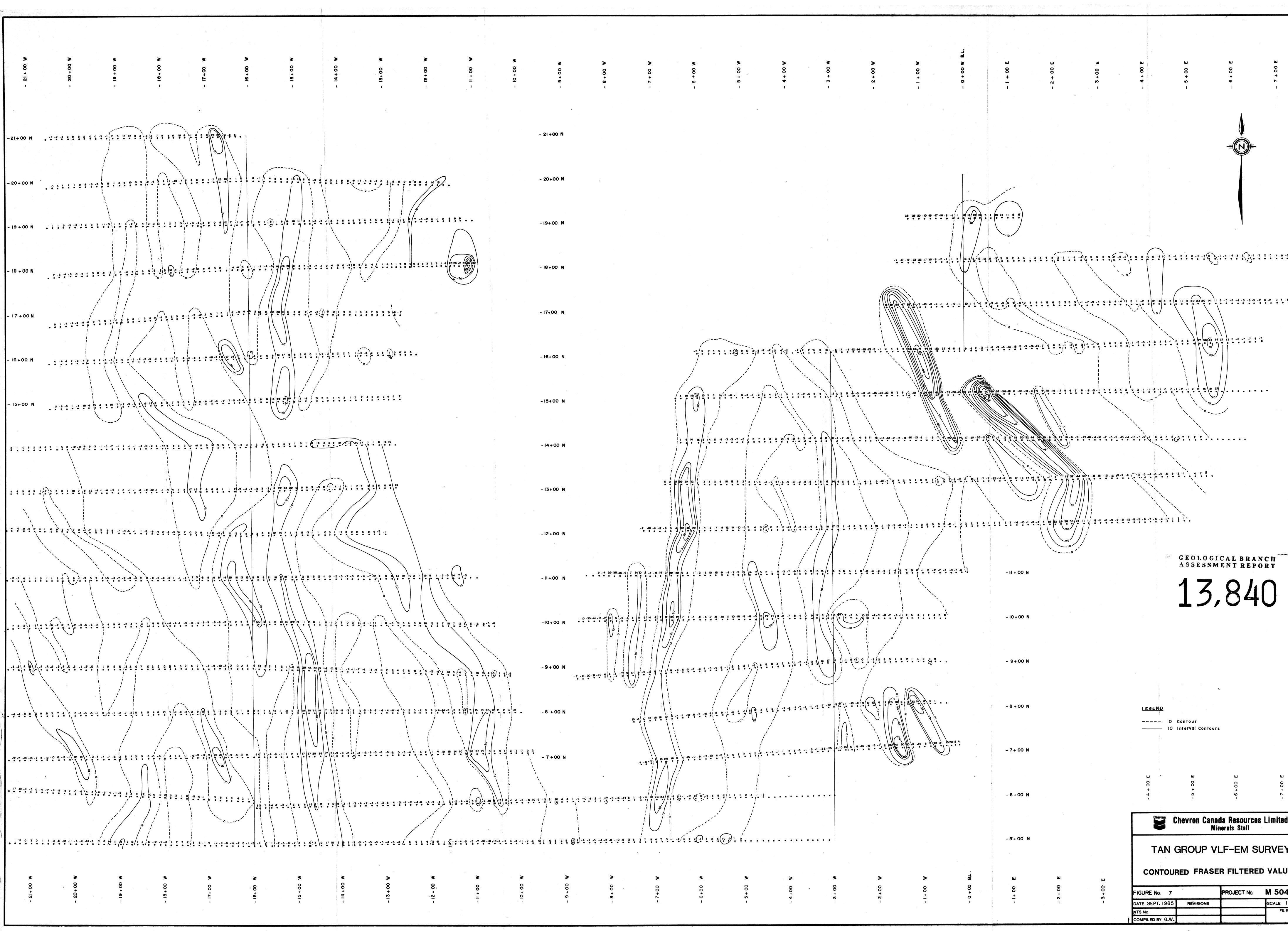
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	Chevron Canada Resources Limited Minerals Staff TAN GROUP VLF PROFILES				
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GEOLOGICAL BRANCH ASSESSMENT REPORT 13,840LEGEND ---- O Contour Interval Contours **Chevron Canada Resources Limited** Minerals Staff TAN GROUP VLF-EM SURVEY CONTOURED FRASER FILTERED VALUES PROJECT No. M 504 FIGURE No. 7 DATE SEPT. 1985 REVISIONS SCALE 1:2500 FILE No. COMPILED BY G.W.