

SNOW PEAK PROPERTY

GEOCHEMICAL REPORT

ON THE

*** 811873**

MACK No. 1 to 28 Mineral Claims (inclusive)

Situated 16 air miles West of

DEASE LAKE

LIARD MINING DIVISION

NORTHERN BRITISH COLUMBIA

Latitude 58° 30' North: Longitude 130' West

N. T. S. 104 J/8

ON BEHALF OF

TOURNIGAN MINING EXPLORATIONS LTD.

703 - 535 Thurlow Street

Vancouver 5, B. C.

Report by:

D. R. Cochrane, P. Eng.
A. Scott, B. Sc.

September 6, 1971
DELTA, B. C.

Field Work Between August 6 and 11, 1971

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PREAMBLE:

Between August 6 and 11, 1971, a field crew employed by D. R. Cochrane, P. Eng., completed a geochemical soil sampling survey of approximately seven (7) line miles on mineral claims situated on Snow Peak, in Northern British Columbia. The mineral claims, named Mack No. 1 to 28 inclusive, are situated 16 air miles west of the settlement of Dease Lake, and are owned outright by Tournigan Mining Explorations Ltd., of Vancouver B. C.

The purpose of the geochemical survey, was to explore an area which is largely covered with overburden, but contains outcrops of an altered acidic intrusive, mineralized with scattered molybdenite and chalcopyrite.

This report describes the field, analytical, and data processing procedures, and discusses the results of the geochemical sampling.

SUMMARY AND CONCLUSIONS:

Geochemical soil sampling was conducted on north-south grid lines spaced 400 feet apart. The sample interval was 200 feet along the 12 cross lines, and the sample depth averaged approximately 6 inches.

The soil, on the whole, is a reddish-brown hybrid variety

SUMMARY AND CONCLUSIONS cont'd.

and predominantly a mixture of "B" and "C" soil horizons. The soil is young and poorly developed and lies in alpine flora terrain.

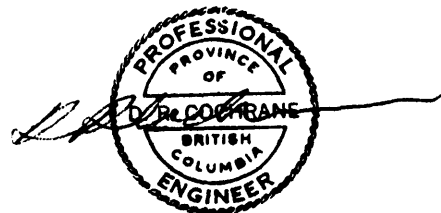
The 184 geochemical soil samples were analyzed in Vancouver, B. C. by Crest Laboratories Ltd. Samples were dried, screened to -80 mesh, digested with HClO_4 and HNO_3 and analyzed for Cu and Mo by atomic absorption and colorimetric methods. The copper content of the Snow Peak soils ranged from a low of 15 to a high of +2000 parts per million (p.p.m.). The arithmetic mean is 180 p.p.m. These values above 750 p.p.m. are classed, on a statistical basis, as highly anomalous, and two areas of "highly" anomalous copper content were located. Anomaly Cu-2 is undefined to the south and east.

The molybdenum content of the Snow Peak soils ranged from a low of 4 to a high of 680 p.p.m. The arithmetic mean is 40 p.p.m. Those values in excess of 420 p.p.m. Mo are classed as "highly" anomalous, and two areas were found to contain highly anomalous results. These anomalies coincide well with the copper soil anomalies, and the coefficient of correlation between the Cu and Mo results is 0.56.

SUMMARY AND CONCLUSIONS cont'd

Investigation of the coincident, anomalous zones of Mo and Cu in the soils on the Mack claims is recommended.

Respectfully submitted,



D. R. Cochrane, P. Eng.,

September 6, 1971.
DELTA, B. C.

LOCATION AND ACCESS:

The Mack claims on Snow Peak are centered 16 air miles west of the settlement of Dease Lake in northern British Columbia. Dease Lake is accessible from Watson Lake, Y.T. via the Cassiar-Telegraph Creek Road which joins the Alaska Highway a few miles west of the town of Watson Lake. A D.O.T. landing strip close to the weather station at Dease Lake is suitable for small aircraft, and in the summer months, a helicopter base operates from near the south end of Dease Lake. The soil sampling crew mobilized to Snow Peak via helicopter from this base. The Dease Lake-Telegraph Creek Road extends southwest from the south end of Dease and crosses Auguschildle Creek some 16 miles west of the settlement. Auguschildle Creek drains the south flank of Snow Peak, and at this point the claims are 8 air miles north of the road.

The claims center reference co-ordinates are: Latitude $58^{\circ}30'$ N; Longitude $130^{\circ}20'$ W and the N.T.S. reference code is 104J/8. (See Figure 1)

CLAIMS AND OWNERSHIP:

The Mack Numbers 1 to 28 claims form a contiguous block of full sized located mineral claims. (See Figure 2). They are owned outright by Tournigan Mining Explorations Ltd., of 1177 W Hastings Street, Vancouver, B. C.

CLAIMS AND OWNERSHIP cont'd

The claims are located in the Liard Mining Division and are outlined on B. C. Department of Mines Claims Map 73M-3. Mack Claims Numbers 1 to 28 have corresponding record numbers of 39272 to 39299 inclusive.

GENERAL SETTING:

Snow Peak is the most prominent physical feature in the Dease Lake area and is situated in the Tanzilla Plateau subdivision of the Stikine Plateau physiographic region of northern B. C. It rises to 6,348 feet above sea level, from the Tanzilla and Dease Lake valleys which are close to 2,500 feet above sea level. The local tree line lies at approximately 5,000 feet and thus the claims are covered by alpine flora. A small tarn lake is located in the north claims area, and drainage is northerly into Little Dease Creek. The south claims area is drained by an upper branch of Tatsho Creek and Auguschidle Creek.

The Dease Lake area was mapped by H. Gabrielse, J.G. Souther and E. F. Roots during "Operation Stikine" in the late 1950's. The Geological Survey Map is number 21-1962.

The Mack claims are shown as lying within an east-west directed band of Lower Jurassic metasedimentary rocks, including abundant sills and dikes of feldspar porphyry. A small

GENERAL SETTING cont'd

quartz monzonite stock is shown intruding the metasedimentary series immediately north of the prominence on Snow Peak. Mr. J. F. Ariz conducted a photogeological study on the Mack Group and environs and with the aid of Map 21-1962 and notes by M. H. Nailer, a geologist for Tournigan Mining, Mr. Ariz has drafted a detailed compilation map and accompanies a private report.

The bedrock complex is divided into:

- middle Jurassic and/or Cretaceous intrusions,
- Lower Jurassic metasediments,
- Upper Jurassic metasediments, and
- Triassic intrusions.

The predominant mineralized fracture sets are shown as trending northwest by west through the Triassic quartz monzonite stock.

GROUND CONTROL GRID:

The ground control grid is shown in Figure 2, in relation to the claim outlines. A base line, running due west, was sighted in with a Brunton compass, and extends from the south end of "Tarn" Lake, easterly across Mack No. 6, 4 and No. 2 claims. The base line was chained and 100 foot station intervals were flagged and numbered, starting at the extreme west end with 0 + 00 to 44 + 00 East at the extreme east end. Cross lines

GROUND CONTROL GRID cont'd

were turned off at 400 foot intervals along the base line, trend due north and south, and are chained and flagged at 100 foot intervals from the central base line, to 15 + 00 North and 15 + 00 South. It was along the above described ground control grid that the soil sampling took place.

GEOCHEMICAL SOIL SAMPLING PROCEDURE:

After the soil sampling grid was completed, the samplers, Mr. N. Estacaille, and Mr. D. Griffith, excavated, by grub hoe and trowel, two orientation pits, one at 1 + 00 N on line 28 + 00 E, and a second at 11 + 00 N on line 20 + 00 E. These pits are used to map the vertical soil profile, and to sample various soil horizons for interpretive purposes.

Soil samples were collected from holes excavated by grub hoe, and a sample of approximately ¼ lb. was scooped up with a trowel and placed in a pre-numbered water resistant kraft paper geochemical bag. The samplers recorded the sample number; line and station number; colour of soil; type of soil; soil horizon; depth of sample; and remarks at each sample position on standard printed soil sampling note forms.

In addition to the orientation pits, soil samples were collected at 200 foot intervals along all cross lines of the ground control grid. The samples were collected at various depths

GEOCHEMICAL SOIL SAMPLING PROCEDURE cont'd

ranging from 2 inches to 10 inches, but averaging approximately 6 inches deep. After each days sampling, the sample bags were placed on a cord and hung up to air dry in the tent. On completion of sampling, the samples were packed in large plastic bags, sealed in a cardboard carton and shipped to Vancouver via a commercial airline.

The samples were delivered to Crest Laboratories of Vancouver, B. C., where samples were oven dried (if still damp), screened to minus 80 mesh, digested in hot HClO_4 and HNO_3 and analyzed for Cu and Mo by atomic absorption and colorimetric methods.

SOIL DESCRIPTION:

The colour of the soil varied from a light brown through red brown to dark brown. The soil was variously classed as a gravelly sand, sandy gravel, sandy clay, sandy silt and silty clay. Most of the soil descriptions on the plateau area, south and west of the cirque rim were of "sandy gravel". An area in and around the Tarn Lake was underlain by a silty sand and a sandy clay.

Soil horizons are poorly developed in the Mack Claims, and much of the soil is a "young" residual to hybrid (residual-transported mixture) variety. Many of the samples contained

SOIL DESCRIPTION cont'd

small angular crumbling pieces of weathered bedrock and sampling showed that the soil is a relatively thin cover over much of the sample area.

The soil samples then may be best classified as a B and C soil horizon mixture.

DATA PROCESSING:

The arithmetic means, standard deviations, and the coefficient of correlation were calculated and the data was grouped into classes with the aid of a Diehl Algotronic Programmable calculator.

The raw geochemical data was coded on paper punch tape and the processing was done automatically by programs prepared by D. R. Cochrane personnel.

DISCUSSION OF RESULTS:

A: Copper -

The copper content of the Snow Peak soils ranged from a low of 15 parts per million (p.p.m.) to a high of + 2000 p.p.m. The arithmetic mean of a total of 184 samples is 180 p.p.m. and the deviation is 283 p.p.m. A frequency distribution histogram accompanies this report as Figure No. 3. It shows a very prominent primary mode in the 50 to 99 p.p.m.

DISCUSSION OF RESULTS

A: Copper cont'd. -

class, and accounts for 3 percent of the total population.

A secondary mode lies in the 400 to 449 p.p.m. range and accounts for about 3 percent of the total population. The histogram shows the presence of at least two families, one which may be called family "A" between 0 and 300 p.p.m., which is log normally distributed and is presumably a "background" group.

A second group of copper values lies above the 300 p.p.m., and contains a number of small modes. (Thereby suggesting several families).

Due to the restricted area in which soil sampling was conducted, it is impossible to determine a definite regional "background" or threshold. Based on the statistics however, the following "classes" of copper values have been devised and are herein defined as:

<u>Range</u>	<u>Class</u>
<180 p.p.m.	below average
180 - 299 p.p.m.	above average
300 - 749 "	moderately anomalous
> 750	highly anomalous

The results in general are extremely high, and the Snow Peak soils must certainly be classed as very copper rich. The average content of copper in soils reported by Hawkes and Webb

DISCUSSION OF RESULTS cont'd

(1962:"Geochemistry in Mineral Exploration," Harper and Row, New York) is 20 p.p.m. and range 2 to 100 p.p.m. (page 364).*

The areal distribution of copper in the Snow Peak soils accompanies this report as Figure 5. It shows the presence of two large "Anomalous" areas, one centered at 16 + OOE on the base line, and designated Cu - 1; and a second centered at 12 + OOS on line 40 + OOE, and designated Cu - 2. Anomaly Cu - 1 is characterized by a central "highly anomalous" copper content core, trending slightly north of east, and 1200 feet long by 100 to 200 feet wide. Anomaly Cu - 1 peaks at 1050 p.p.m. Cu at 1 + OOS on line 16 + OOE.

Anomaly Cu-2 is open to the south and east, but apparently trends slightly south of east, and the "highly anomalous" core is over 600 feet wide and over 800 feet long. This anomaly peaks at +2000 p.p.m. Cu at 12 + OOS on line 40E.

Two additional one sample highs are located at the north end of line 4 + OOE, and the south end of line 24 + OOE respectively.

DISCUSSION OF RESULTS:

B: Molybdenum -

The molybdenum content of the Snow Peak soils ranged from a low of 4 p.p.m. to a high of 680 p.p.m. The arithmetic mean is

* Geochemistry in Mineral Exploration, Harper and Row, N.Y.

40 p.p.m. and standard deviation 125 p.p.m. A frequency histogram accompanies this report as figure No. 4. It shows a positively skewed, apparently log normal, multimodal distribution. The primary mode lies in the < 50 p.p.m. class and this class accounts for 52 percent of the total population. A secondary mode lies in the 450 - 499 range, and a tertiary mode in the 250 - 299 p.p.m. range.

In general, the molybdenum content of the Snow Peak soils is extremely high. Hawkes and Webb (Geochemistry in Mineral Exploration) cite the average Mo content of soils is 2 p.p.m. and range 0.2 to 5 p.p.m.

As with copper, the soil sampling survey is believed to be too restricted in areal extent to be able to determine the "regional" background molybdenum value. However, based on the statistics, and frequency distribution, the following "classes" have been devised.

Range	Class
< 90	below average
90 - 219	above average
220 - 420	moderately anomalous
> 420	highly anomalous

Figure 6 is the molybdenum geochemical plan, and shows two anomalous areas. Anomaly Mo - 1 is centered on the base line at 16 + 00E. It is elongated northeast by east, and the highly anomalous core is 1200 feet long and 300 feet wide.

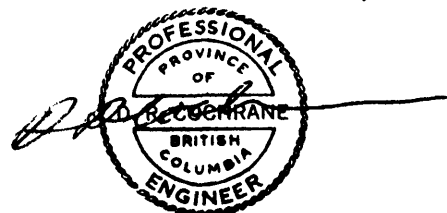
Anomaly Mo - 2 is centered in and around 12 + OOS on line 32E. The peak value is 680 p.p.m. Mo.

DISCUSSION OF RESULTS:

C: Correlation -

Figure 7, a compilation plan which accompanies this report shows the copper and molybdenum geochemical "highs" in relation to each other. There is obvious and excellent correlation of anomalies Cu - 1 and Mo - 1. Anomalies Mo - 2 and Cu - 2 overlap a small amount, however there is some considerable westward displacement of Mo - 2 in relation to Cu - 2. The coefficient of correlation of the Mo and Cu geochemical results was calculated and is +0.56. (note-a coefficient of -1.0 implies perfect inverse correlation; of 0.0, no correlation; and of +1.0 a perfect positive correlation). Thus, correlation is quite good, and suggests the anomalous Cu and Mo values originate from the same or a similar source.

Respectfully submitted,



D. R. Cochrane, P.Eng.,
September 6, 1971,
Delta, B.C.

APPENDIX I
Certificates

Name: COCHRANE, Donald Robert

Education: B.A.Sc. - University of Toronto
M.Sc. (Eng.) - Queen's University

Professional Associations: P.Eng. of B.C., Ontario, and Saskatchewan.
Member of C.I.M.M., G.A.C., M.A.C., Geological Engineer.

Experience: Engaged in the profession since 1962 while employed with Noranda Exploration Co. Ltd., Quebec Cartier Mines Ltd., and Meridian Exploration Syndicate.

Name: SCOTT, Alan R.

Education: B.Sc. - Geophysics, U.B.C.

Experience: Two summers - crew member and operator with Geo-X-Surveys Ltd.,
Presently employed with D.R. Cochrane, P.Eng. - Geophysicist

Professional Associations: Member of S.E.G.

Name: GRIFFITH, Dave

Education: B.A. (English), Queen's, 1970

Experience: 1 Field Season, general experience in mining exploration. 1 Season with D.R. Cochrane - Chief Operator.

Name: ESTACAILLE, Norman

Education: Grade 12 Diploma

Experience: ½ year exploration experience with Hunttec.
Presently employed with D.R. Cochrane.

Name: ELLIOTT, David

Education: Presently - student B.C.I.T. - Computer Technology

Experience: 2 years - Geology - Geophysics - U.B.C.
5 years - Field work and Geological Drafting

APPENDIX II

Personnel & Dates Worked

The following personnel employed by D. R. Cochrane, P.Eng. were engaged in the Snow Peak project on behalf of Tournigen Mining Explorations Ltd.

<u>Name</u>	<u>Job</u>	<u>Date (s)</u>
D. Griffith	Scil Sampling	Aug. 6 to 11
N. Estacaille	" "	Aug. 6 to 11
A. Scott	Data Processing	Aug. 24, 28, 30
D. Elliott	Drafting	Aug. 28, 30, 31, Sept. 1
D. R. Cochrane	Report Preparation	Aug. 30, 31, Sept. 1

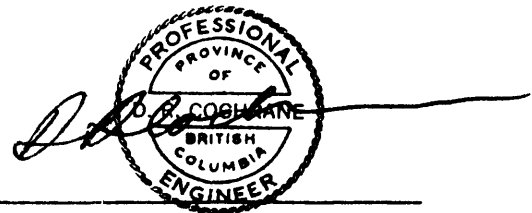
APPENDIX III

Cost Breakdown

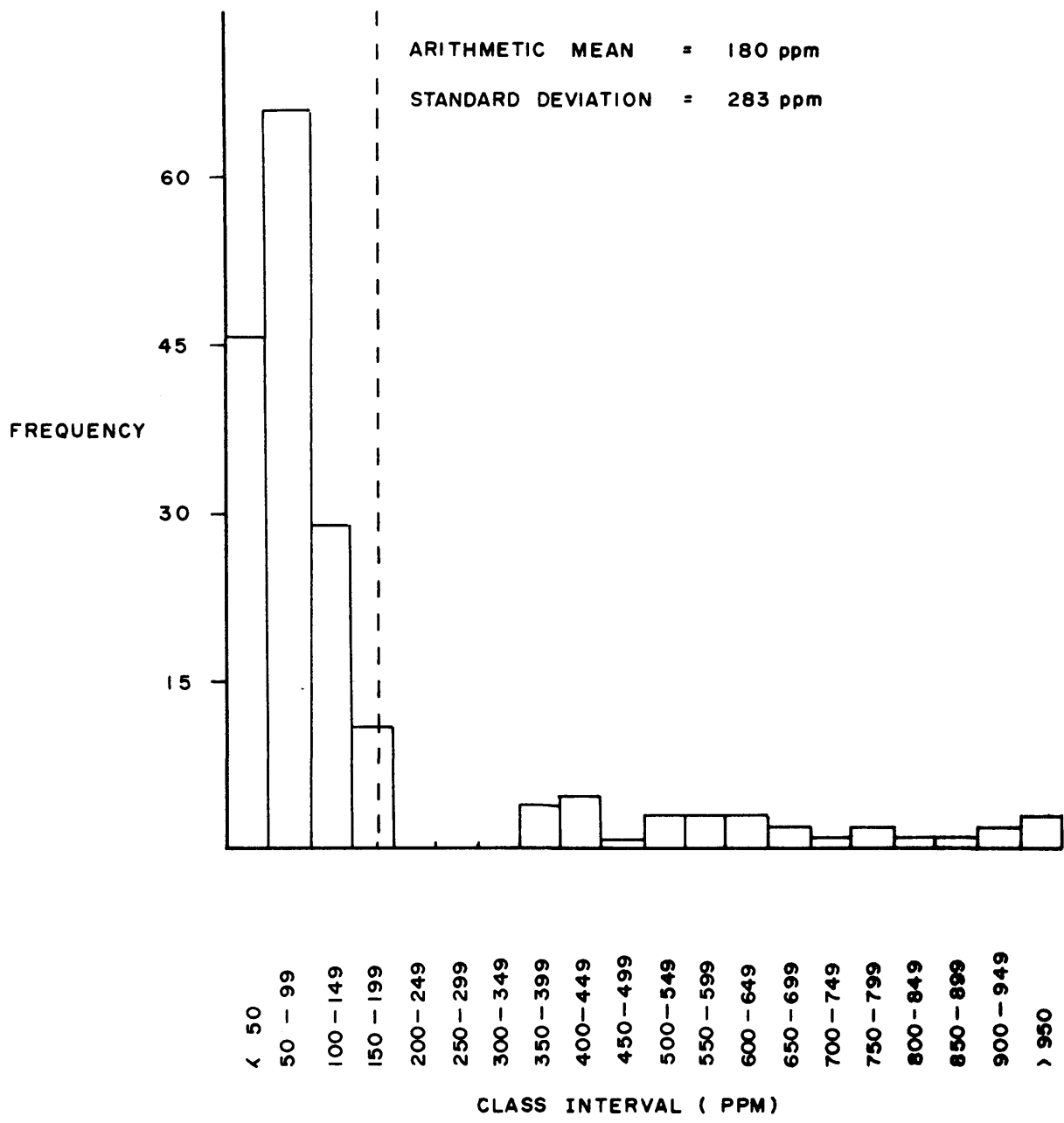
By contract between Tournigan Mining Explorations Ltd., and
D. R. Cochrane, P.Eng. and Dated August, 1971.

Geochemical Soil Sampling survey, on the Mack claims, Snow Peak,
B.C., of approximately seven line miles, and including analysis
for samples taken at 200 foot intervals on lines 400 feet apart.

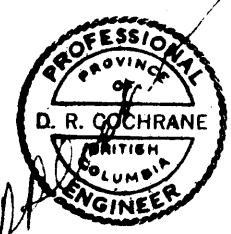
TOTAL ----- \$ 2,800.00



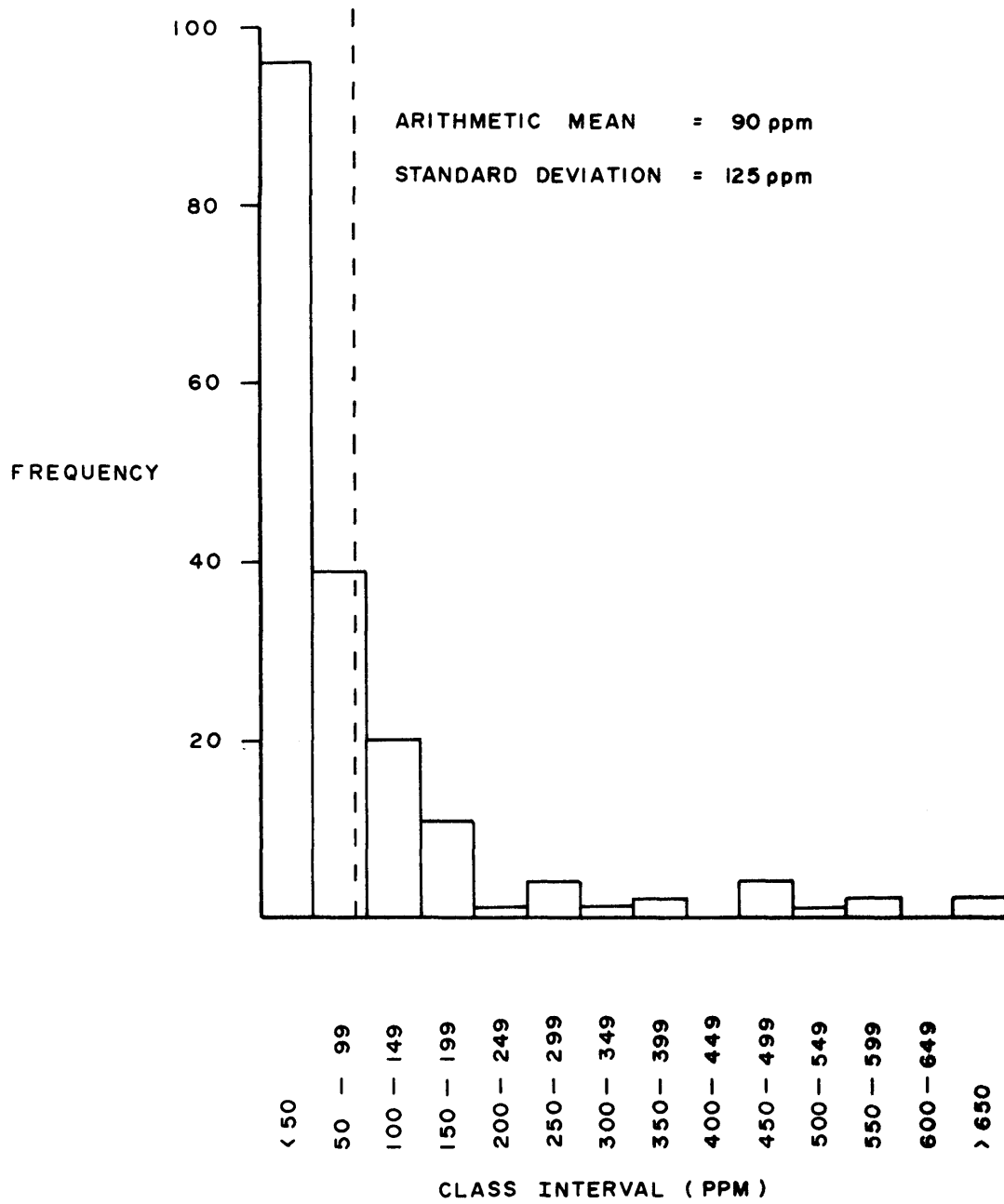
D. R. Cochrane, P.Eng.



TOURNIGAN MINING EXPLORATIONS LTD.
SNOW PEAK PROPERTY
 FIGURE 3
FREQUENCY DISTRIBUTION HISTOGRAM
COPPER (ppm)



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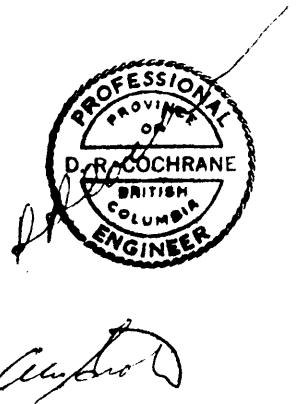


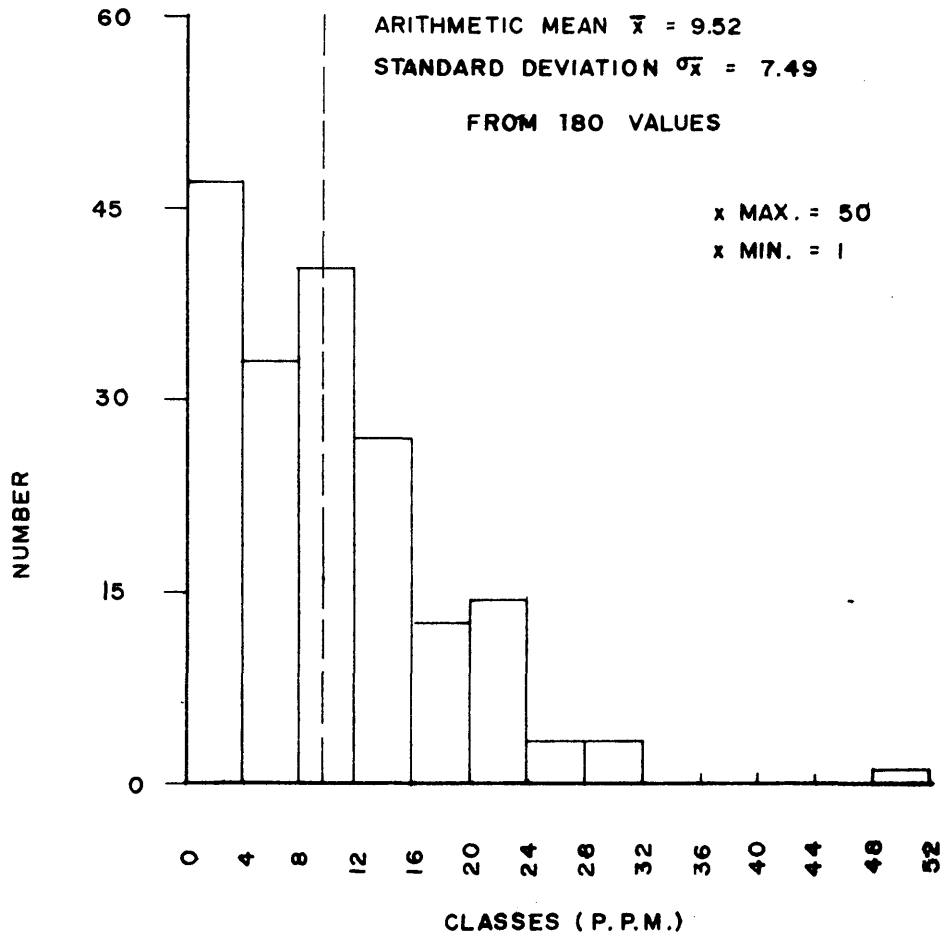
TOURNIGAN MINING EXPLORATIONS LTD.

SNOW PEAK PROPERTY

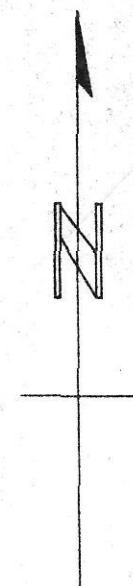
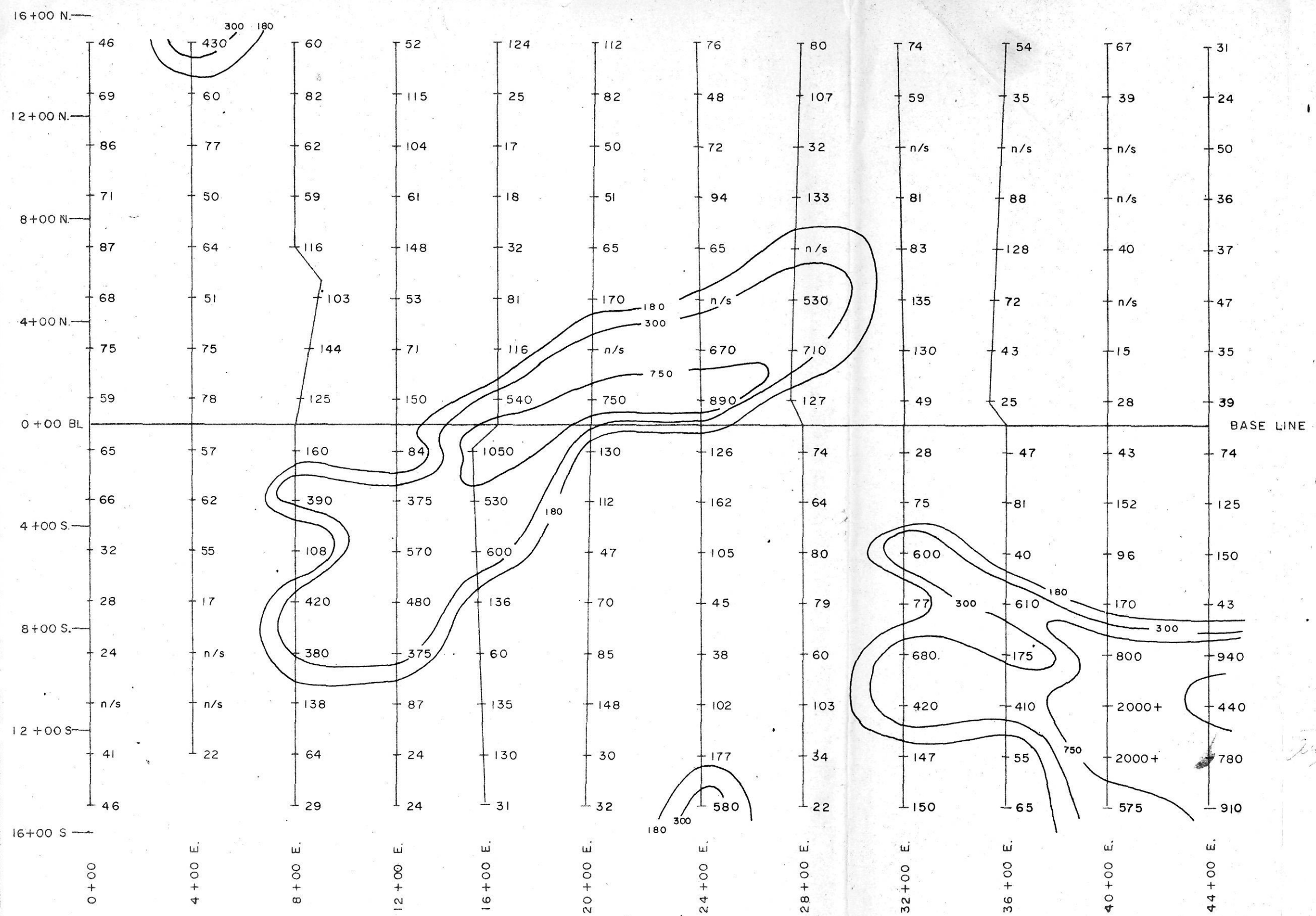
FIGURE 4

**FREQUENCY DISTRIBUTION HISTOGRAM
MOLYBDENUM (ppm)**

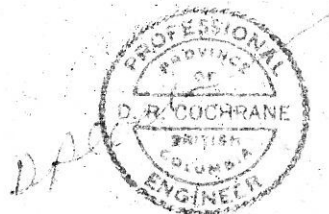




TOURNIGAN MINING EXPLORATIONS LTD.
 SNOW PEAK PROPERTY
 FIGURE 10
 FREQUENCY DISTRIBUTION HISTOGRAM
 TUNGSTEN (p.p.m.)



CONTOURED AT 180, 300 & 750 PPM



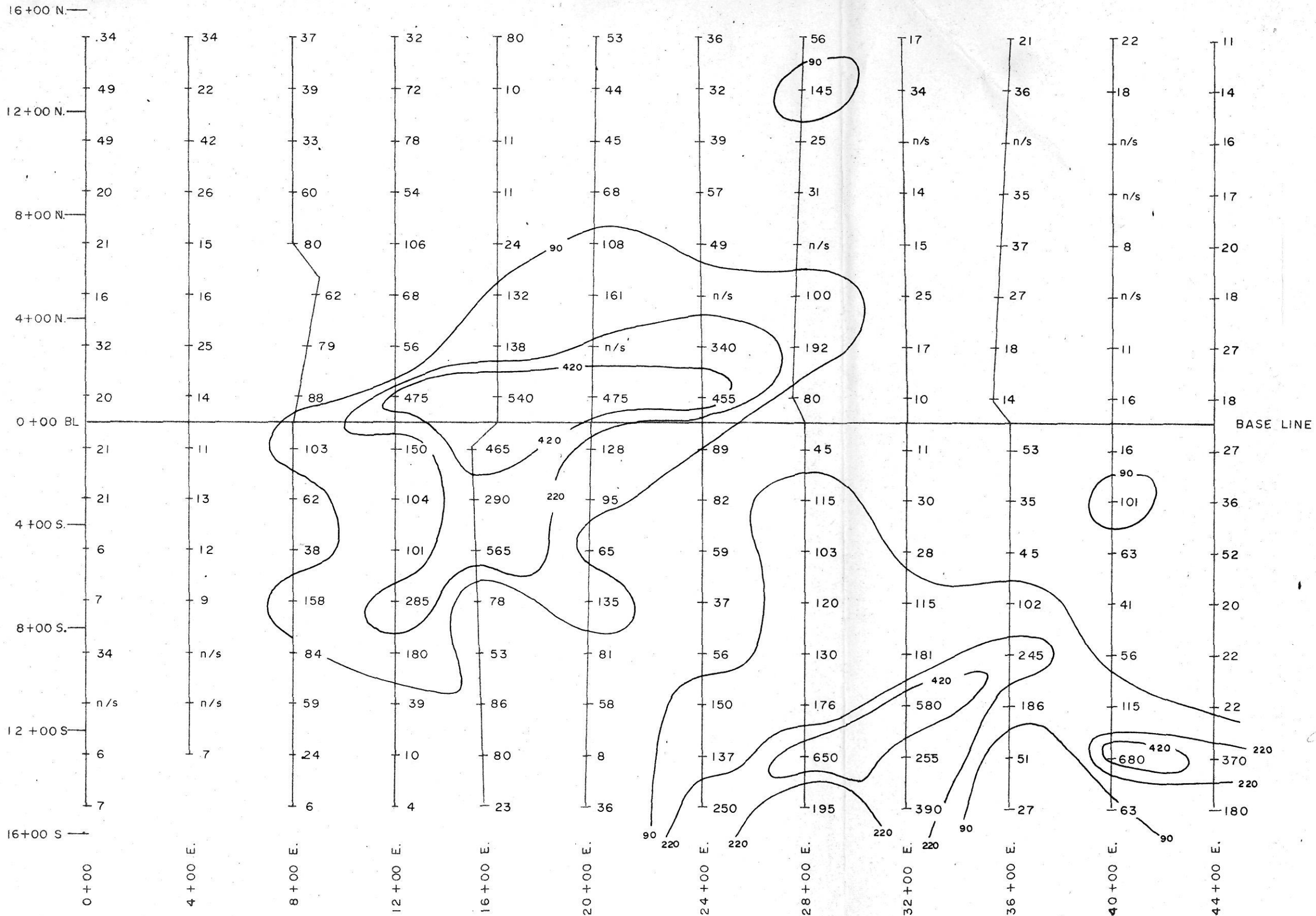
TOURNIGAN MINING EXPLORATIONS LTD.

SNOW PEAK PROPERTY GEOCHEMICAL PLAN

FIGURE 5
COPPER PPM
SCALE - 1:400

n/s NO SAMPLE

To accompany geochemical report by D.R. Cochrane, P. Eng. on the Snow Peak Property dated at Delta, B.C.



CONTOURED AT 90, 220 & 420 PPM.



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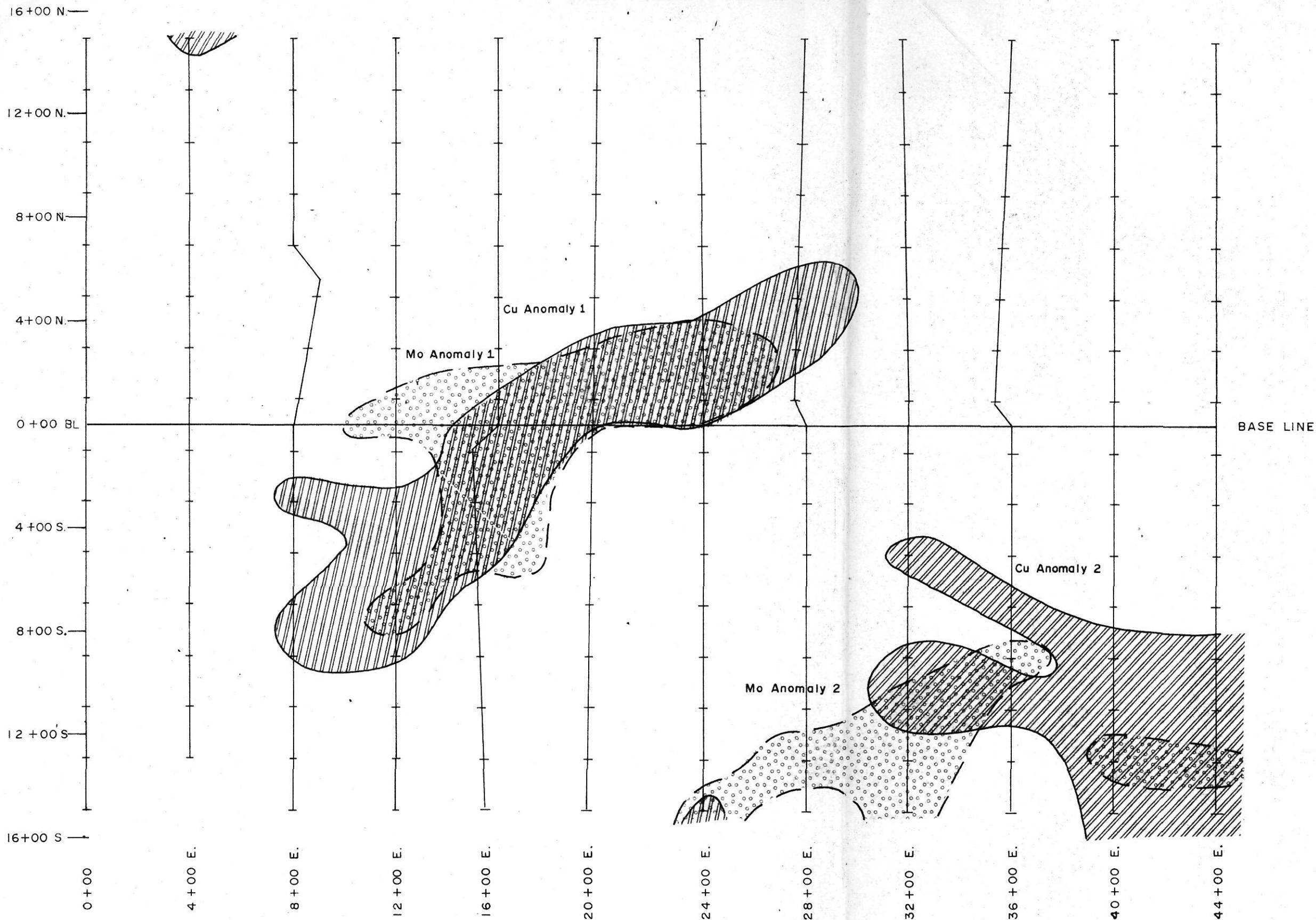
**SNOW PEAK PROPERTY
GEOCHEMICAL PLAN**



FIGURE 6
MOLYBDENUM PPM
SCALE - 1:400

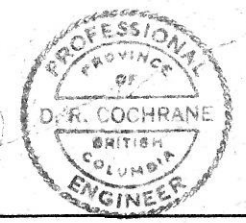
0 Feet 800

n/s NO SAMPLE

To accompany geochemical report by D.R. Cochrane, P.Eng. on the Snow Peak Property dated at Delta, B.C.



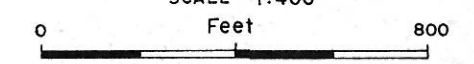
 > 300 ppm COPPER
 > 220 ppm MOLYBDENUM



TOURNIGAN MINING EXPLORATIONS LTD.

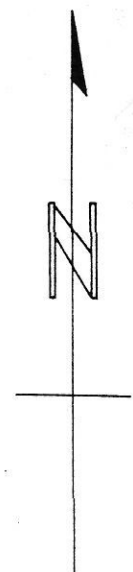
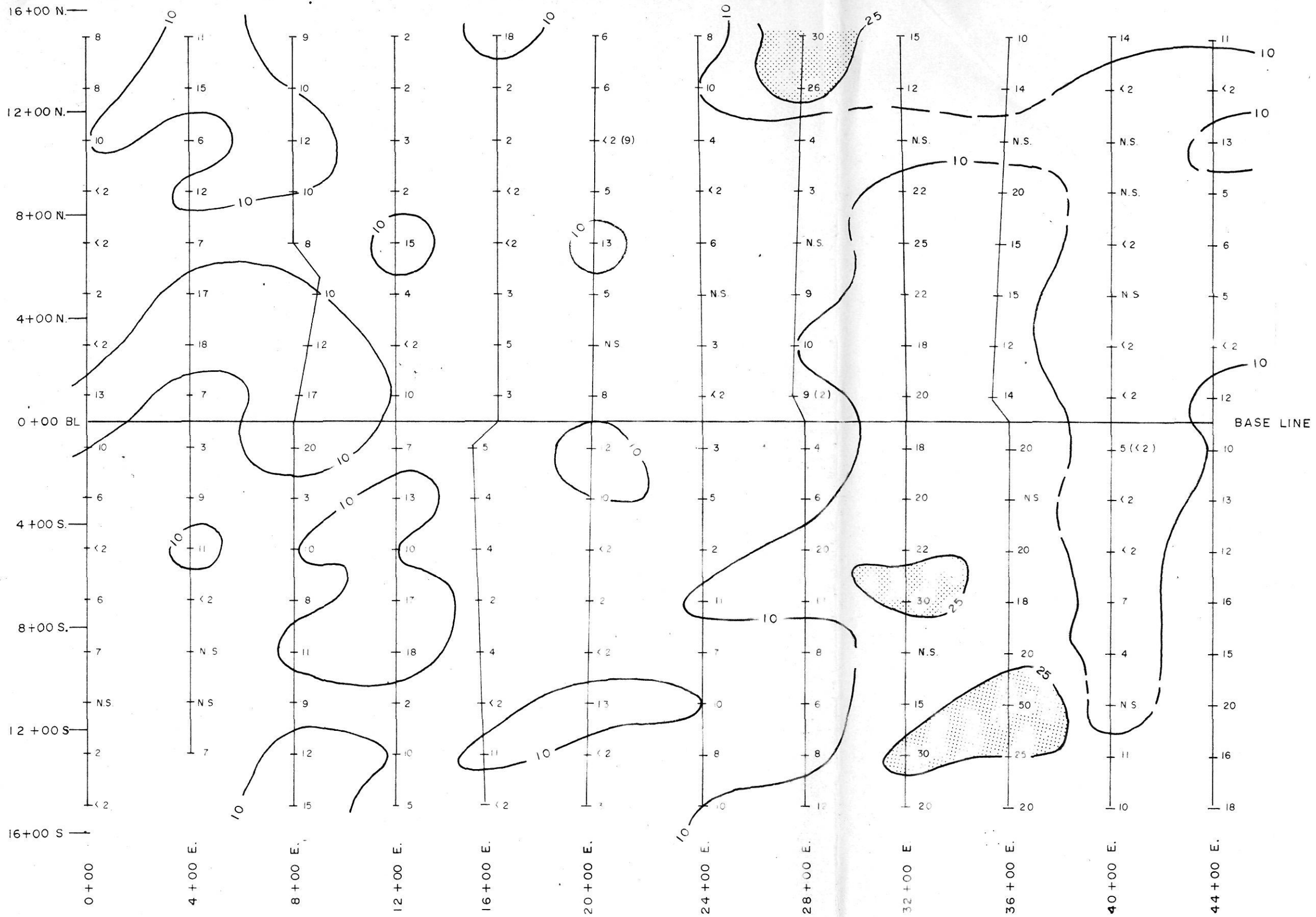
**SNOW PEAK PROPERTY
GEOCHEMICAL PLAN**

FIGURE 7
COMPILATION PLAN
SCALE - 1:400



n/s NO SAMPLE

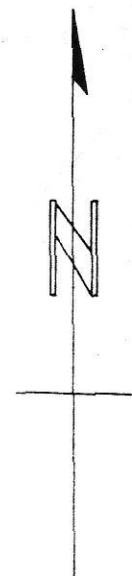
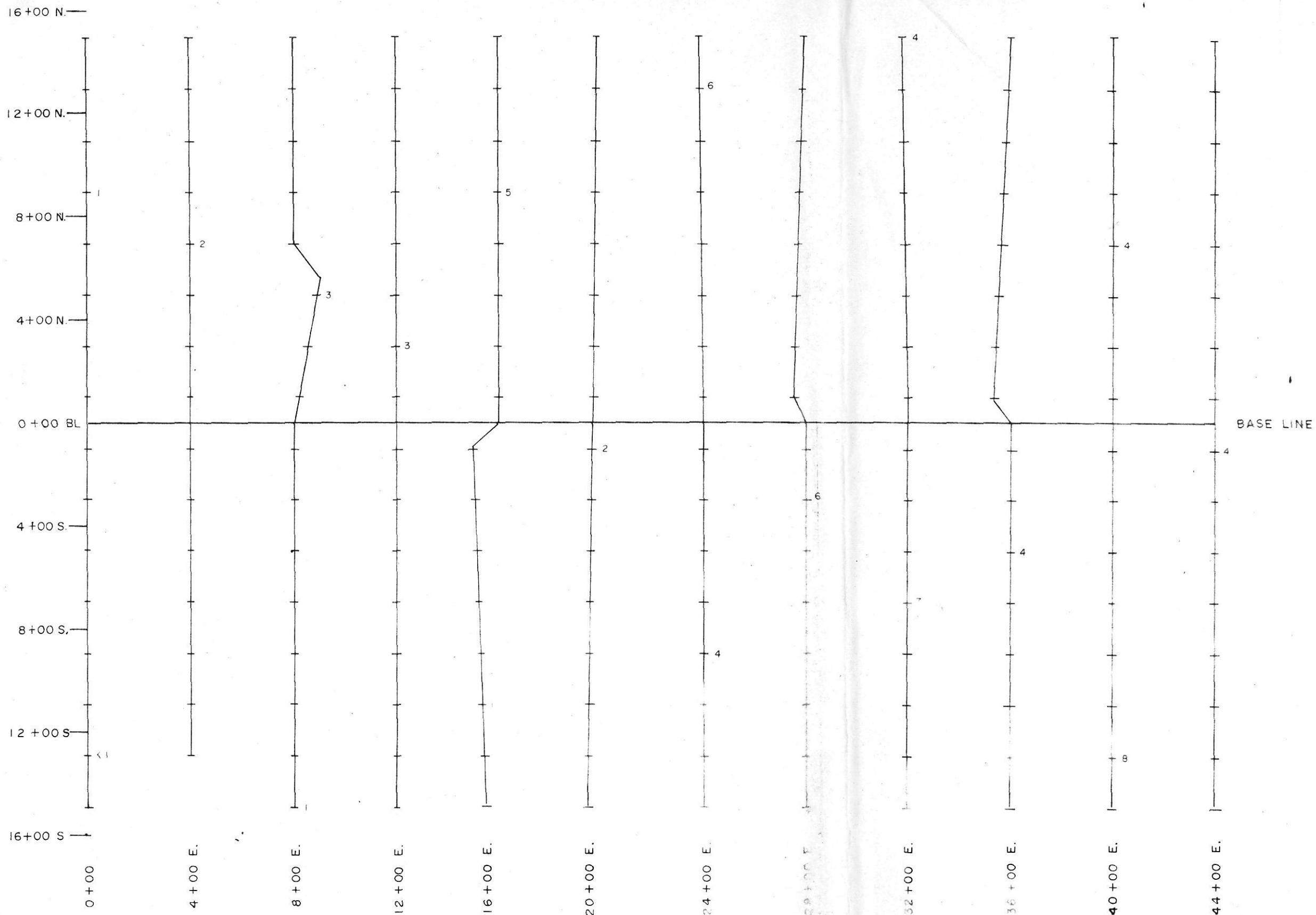
To accompany geochemical report by D.R. Cochrane,
P. Eng. on the Snow Peak Property dated
at Delta, B.C.



TOURNIGAN MINING EXPLORATIONS LTD.
**SNOW PEAK PROPERTY
 GEOCHEMICAL PLAN**
 FIGURE 8
TUNGSTEN (P.P.M.)
 SCALE - 1:400
 0 Feet 800

N.S. NO SAMPLE
 (2) CHECK SAMPLE

To accompany geochemical report by D.R. Cochrane,
 P. Eng. on the Snow Peak Property dated Sept. 30/71
 at Delta, B.C.



TOURNIGAN MINING EXPLORATIONS LTD.

**SNOW PEAK PROPERTY
GEOCHEMICAL PLAN**

FIGURE 9
TIN (PPM.)
SCALE - 1:400

n/s NO SAMPLE

To accompany geochemical report by D.R. Cochrane,
P. Eng. on the Snow Peak Property dated Sept. 30 / 71
at Delta, B.C.