

## GEOLOGICAL, GEOCHEMICAL, GEOPHYSICAL AND PROSPECTING REPORT

## PETEKA 1 TO 4 CLAIMS

Latitude 56°<sup>09.5'</sup>~~00'~~ North  
 Longitude 126°<sup>57'</sup>~~58'~~ West

N.T.S. 94D/2W  
 Omineca Mining Division  
 British Columbia

FILMED

for

Owner/Operator: Suncor Inc., Resources Group  
 Calgary, Alberta

**GEOLOGICAL BRANCH  
 ASSESSMENT REPORT**

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## TABLE OF CONTENTS

	<u>Page No.</u>
Introduction	1
Location and Access	2
Property and Ownership	3
Physiography and Topography	4
Previous Work	5
Exploration Program 1985	6
Summary of Expenditures	7
Work Completed 1985	8
Geology	8
Table of Formations	9
Detailed Rock Description	10
Structure	11
Metamorphism and Alteration	12
Economic Geology and Mineralogy	14
Geophysics	16
Magnetometer Survey	16
VLF Survey	17
Results of the Geophysical Surveys	17
Geochemistry	19
Statistical Analysis	20
Geochemical Anomalies and Results	21
Summary and Conclusions	25
Recommendations	27
References	28
Author's Qualifications	29
Appendix I Rock Sample Descriptions	30
Appendix II Analytical Results	31
Appendix III Analytical Methods	32
Tables	20
Table I Summary of Statistical Results	20

## MAPS TO ACCOMPANY REPORT

1. Geology and Rock Sample Location
2. Analytical Results - Rock Samples
3. Soil Sample Location Map
4. Geochemical Results Cu, Pb, Zn
5. Geochemical Results Au, Ag, As
6. VLF EM-16 Survey
7. VLF Survey - Fraser Filter
8. Magnetometer Survey
9. Gold anomaly map
10. Silver anomaly map
11. Copper anomaly map
12. Lead anomaly map
13. Zinc anomaly map

INTRODUCTION

The Peteka 1 to 4 Claims were staked in August 1984 and recorded on September 7, 1984. Preliminary sampling and prospecting were completed in August and September 1984.

In 1985 an exploration program including geological mapping, prospecting, geochemical soil sampling and geophysical surveys as completed to follow up the 1984 program.

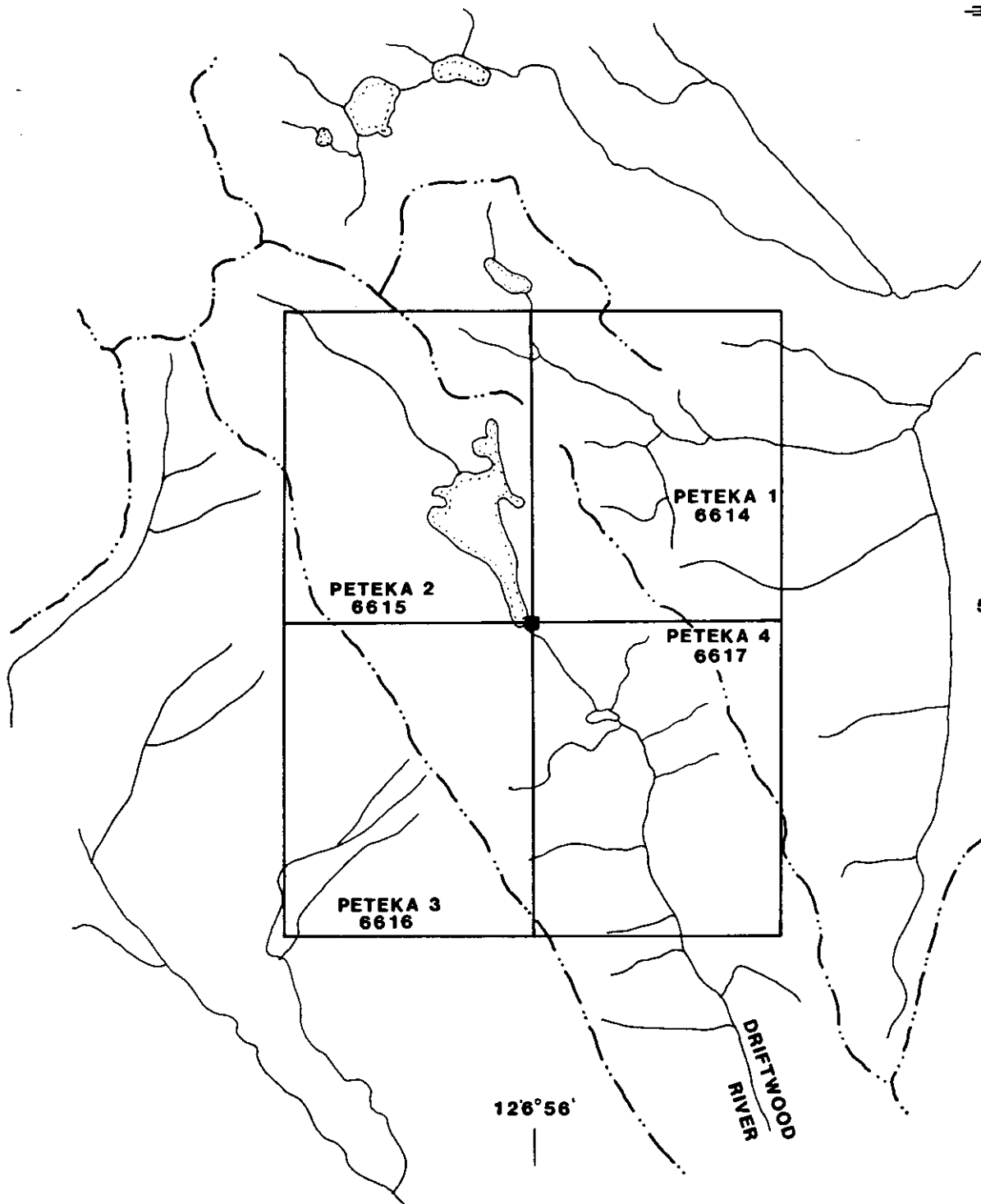
This report discusses the results of the 1985 exploration program.

LOCATION AND ACCESS

The Peteka 1 to 4 claims are located within the Omineca Mining Division in NTS map area 94D/2W. The claims are situated at the head waters of the Driftwood River about 5 kilometers west of Bear Lake and approximately 160 km north of the town of Smithers, B.C.

The approximate geographical coordinates of the Peteka claims is 56°08' north latitude and 126°56' west longitude.

Access to the property is via helicopter. The abandoned British Columbia Railway between Fort St. James and Bear Lake is situated approximately 6.5 km east of the property.



**Suncor** inc Resources Group

COAL AND MINERALS  
DEPARTMENT

# BEAR LAKE PROJECT PETEKA CLAIM MAP

DATE DEC.85	SCALE 1:50 000	NTS 94D/2.3	DRAWING No
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PROPERTY AND OWNERSHIP

The Peteka 1 to 4 claims are located within the Omineca Mining Division and are 100% owned by Suncor Inc. Resources Group of Calgary, Alberta.

The Peteka 1 to 4 claims consist of the following

<u>Claim</u>	<u>Units</u>	<u>Record</u>	<u>Date of Record</u>
Peteka 1	20	6614	September 7, 1984
Peteka 2	20	6615	September 7, 1984
Peteka 3	20	6616	September 7, 1984
Peteka 4	20	6617	September 7, 1984

PHYSIOGRAPHY AND TOPOGRAPHY

The Peteka claims are for the most part located above tree line and the vegetation consists mainly of small shrubs and grasses. However, a portion of the Peteka 4 claim covers part of the Driftwood River valley, this area is covered with spruce and small pine trees.

Topography of the Peteka claims is mountainous with an elevation maximum of 1900 meters, minimum of 1250 metres in the Driftwood River Valley and the northeast corner of Peteka 2. The mountains have steep talus slopes and sharp peaks west of the Driftwood River and are not traversable in many areas.

Glaciation on the Peteka Claims has been extensive with the deep cut river valley and cirques. Several small glaciers still remain on the mountains west of the headwaters of the Driftwood River.



PREVIOUS WORK

Very little previous work has been completed on the Peteka Claims, a brief summary of the previous work history of the Peteka Claims follows:

1948: Lord, C.S.; Geological Survey of Canada, Memoir 251, McConnell Creek Map-Area, Cassiar District, British Columbia, Report on geological mapping program by C.S. Lord 1941, 1944, and 1945 of McConnell Creek map-area.

1973: Preliminary exploration on portions of the Peteka claims by the Canadian Nickel Company.

1984: Preliminary prospecting by Suncor Inc. Resources of the Peteka Claims.

EXPLORATION PROGRAM 1985

The 1985 exploration program was designed to follow-up the 1984 preliminary prospecting and rock sampling program.

The 1985 program consisted of detailed prospecting, soil geochemistry survey, VLF-EM geophysical survey, rock sampling and geological mapping.

The work was helicopter supported from a base camp located on the Bear Lake airstrip located approximately 10 km northeast of the Peteka 1 to 4 Claims.

Work on the Peteka 1 to 4 Claims was completed on various dates between July 15, 1985 and August 25, 1985.

TABLE 1 - SUMMARY OF EXPENDITURES

PERSONNEL

C. Hartley	geologist	8 day x 135.50	\$1,084.00
A. Smith	geologist	5 day x 135.50	677.50
W. Fisher	prospector	4 day x 123.72	494.88
I. Simpson	geological assistant	21 day x 72.49	1,522.29
S. Scott	geological assistant	11 day x 71.49	786.39
B. Dale	Geological assistant	14 days x 60.88	852.32
M. McDonagh	cook	21 days x 109.80	2,305.80

TRANSPORTATION

Fixed wing support mob-demob - prorated	1,554.39
Travel expenses prorated	709.10
Fixed wing support direct costs	1,721.09
Helicopter 29.5 hours x \$480.00/hour	\$14,160.00

CAMP SUPPORT

Camp accommodation equipment & supplies	4,200.00
\$50 manday X 84 days	

GEOCHEMICAL ANALYSIS

484 soil samples x 15.15/sample	7,332.60
64 rock samples x 15.10/sample	936.20
18 fire assay x 11.30/assay	203.40
43 copper assay x 6.20	266.60

POST FIELD

Data plotting & report writing	3,232.39
Drafting 80 hrs x 25/hour	2,000.00
Reproduction	600.00
Secretarial	300.00
	<u>44,938.95</u>

## GEOLOGY

The Peteka Claims area was originally mapped by C.S. Lord between 1941 and 1945 and reported in the Geological Survey of Canada Memoir 251 published in 1948. He described the rocks southwest of Bear Lake valley as belonging to the Upper Jurassic division of the Takla Group volcanics. Lord states "that volcanic members greatly predominate among the lower strata and sedimentary members in the upper part... interlayered with volcanic rocks." These rocks have since been reclassified by Richard (1976) as part of the Hazelton Group volcanics.

The Peteka claims are underlain predominantly by the lower members of the Hazelton Group volcanics. These rocks consist of predominantly of tuffs and agglomerates and include a wide variety dominantly purple to grey-green rocks of probable andesite composition. Minor mafic lava flows which are porphyritic with phenocrysts of plagioclase and/or hornblende were also locally observed, amygdules were only rarely observed. Minor siliceous interflow sedimentary rocks were occasionally observed in various localities throughout the Peteka Claims.

Geological mapping on the Peteka Claims was restricted, for the most part, to the ridge on the west side of the Driftwood River and south of the larger lake located in the centre of the property.

TABLE OF FORMATIONS

Lower to Lower-Middle Jurassic

Hazelton Group

Mafic lava flows - dark green, grey green to purple, locally porphyritic with plagioclase phenocrysts, occasionally amygdules observed.

Mafic to Intermediate Tuff and Agglomerates - predominantly purple tuffs and coarse agglomerates, occurs locally as grey-green tuffs and agglomerates.

Interflow Sediments - siliceous, to cherty metasedimentary, volcanoclastic rock.

Tertiary

Katsberg Intrusions

Felsic intrusive - Quartz and feldspar porphyry dyke rock.

DETAILED DESCRIPTION OF FORMATIONS

HAZELTON GROUP

Mafic Lava Flows - Mafic lava flows were observed mainly in the Driftwood River Valley. The rocks are fine grained, dark green to grey-green to rarely purple coloured. Typically the lava is locally porphyritic with white to buff, lath shaped plagioclase phenocrysts 2-4mm long in a slightly purple dark green groundmass. The plagioclase phenocrysts make up 5-10% of the rock. Most of the lava is massive, but contains some amygdules 2-5mm in diameter, the amygdules are commonly calcite filled, but are occasionally silica or rarely pyrite filling of amygdules is observed.

Mafic to Intermediate Tuffs and Agglomerates - the pyroclastic rocks of andesite to dacite composition include a wide variety of dominantly purple-grey to grey-green rocks ranging from fine grained tuffs to coarse agglomerates. The tuffs are indurated, massive and vary from fine grained to lapilli tuffs consisting of subangular to angular fragments up to 8 mm. The lapilli tuffs differ from the agglomerates only in size of the constituent fragments. The agglomerates contain fragments ranging in size from 8 mm to 50 cm. The agglomerates are massive and are likely interlayered with the tuffs. The fragments vary from subrounded to angular and are readily distinguished on weathered surfaces. The fragments and groundmass normally consists of the same rock, thus making fragments difficult to distinguish on fresh surfaces.

These pyroclastic rocks are considered to be, at least in part, subaerial volcanics.

Interflow Sediments, Volcanoclastics - volcanoclastic or interflow sedimentary rocks observed on the Peteka claims consisted of a siliceous clastic sedimentary white to light grey coloured. Totally chert bands are common, as well as green coloured well rounded chert pebbles were locally observed.

The volcanoclastics are thought to be an interflow sedimentary unit and separates the major volcanic flows on the property. The volcanoclastic is a minor unit.

### TERTIARY

Katsberg Intrusions - Intrusive rocks on the Peteka claims consist of narrow quartz-feldspar porphyry dykes which crosscut the volcanics. The dykes are 1 to 3 meters wide and strike approximately 040 to 045. The dyke rocks are fine grained to medium grained with quartz and feldspar phenocrysts. The composition of the dyke rocks is almost totally feldspar and quartz with less than 1% biotite.

### STRUCTURE

Mappable structural features on the Peteka claims is limited to major joint fractures and shear zones, which are thought to parallel the major joints on the property. The major joints on the claims strike 140° to 150° and dip 50°-60° southwest or rarely to 70° southwest. The other major joints strike 040° to 045° and dip 60 to 70° northwest. Also a minor shear direction of about 170 to 175° with dips 40-50 degrees to the west were observed in the Driftwood River cut and rarely on the ridge west of the river.

Flow directions are thought to approximately parallel the strike of the mountains 150° to 140°. Lord (1948) indicates dips are approximately 30-50° northeast.

## METAMORPHISM AND ALTERATION

Metamorphic effects on the Peteka Claims are minimal. The only significant metamorphic effect is minor chloritization of the mafic and intermediate volcanics. No other significant metamorphism was observed on the Peteka Claims.

Alteration on the Peteka Claims consists of minor chloritization of the mafic to intermediate volcanics, moderate to intense epidote alteration of the tuffs and agglomerates, and slight to intense hematization of the intermediate volcanics. Carbonate along fractures was observed to be locally abundant.

As discussed above chlorite alteration is minor and associated with slight metamorphism of the mafic volcanics.

Epidote alteration is moderate to intense west of the Driftwood in the intermediate volcanics, tuffs and agglomerates. The epidote occurs mainly as fracture filling, alteration envelopes surrounding fracture coating. Intense to moderate alteration of the fragments within the agglomerates is also locally observed.

Hematization of the volcanic rock was observed throughout the Peteka property. The alteration occurs mainly as red to purple colouring of the pyroclastic rocks. More intense hematization of the volcanic rocks was observed west of the Driftwood River on Peteka 3. Here local intense hematization envelopes, 3 to 6 centimeters wide, are observed surrounding fractures or in rare cases may completely colour the whole outcrop. The hematite alteration is readily recognized as dark red staining.



Carbonate alteration is minor and occurs as fracture filling calcite, rare stringers, rarely as larger 2-5 centimeter calcite veins, or with quartz in narrow quartz-carbonate veins.

Minor silicification was noted within the shear zones as quartz stringers or quartz veinlets.

## ECONOMIC GEOLOGY AND MINERALIZATION

The potential for economic mineralization on the Peteka Claims is limited to the northwest and northeast major fracture systems. These major joint fracture and narrow shear zones are mineralized with massive specular hematite varying in thickness from fracture coating to 1.5 meters. Massive chalcopyrite occurs locally with the specular hematite, both adjacent to the hematite and as open space vug filling within the hematite.

Several of these zones contain significant amounts of copper with occasional significant quantities of gold and/or silver.

These massive specular hematite veins were observed west of the Driftwood River on the Peteka 3 Claim. The specularite and chalcopyrite was observed to strike  $150^{\circ}$  and dip  $50$  to  $70^{\circ}$  southwest. The veins are parallel to the major joint direction. These joints have been mapped over strike lengths of 500 to 800 meters.

Assays results from several grab samples indicate the samples from the above zones contain significant copper, with gold and silver credits.

The gold in the hematite veins apparently occurs as free gold in quartz, no preference for association with sulphide, either pyrite or chalcopyrite veins observed during microscope examination of the polished thin sections. (Alan Smith; personal communication).

Significant assay values occur throughout the entire length of the specular hematite veins. Values range from trace to 16.50% Cu, silver values range from trace to 13.44 oz/ton Ag and gold from trace to 0.255 oz/ton Au.

Other mineralization on the Peteka Claims of possible economic importance is associated with the 040° to 045° striking joints and shears. Mineralization here is similar to the above 150° veins. However the relative abundance of these veins is much more scarce and shear and fracture systems may be of limited strike length. A strike length of more than 200 to 300 meters is unlikely.

The other minor mineralization observed consisted of trace to 2% disseminated pyrite associated with shear zones in the volcanic rocks. No significant assay results were returned from samples analysed from these zones.

## GEOPHYSICS

Geophysical surveys consisting of VLF and magnetometer surveys were conducted in the Driftwood River Valley on the Peteka 3 and 4 Claims. The geophysical grid was established from the legal corner post to the southern boundary of the Peteka 3 and 4 claims. A base line was established sub-parallel to the Driftwood River Valley and cross lines 90° to the base line were established at a spacing of 150 meters with stations read and marked every 25 meters. A total of 15.25 line km of survey was completed.

### Magnetometer Survey

The magnetometer survey was conducted using a Scentrix MP-2 proton precession magnetometer reading the total intensity of the magnetic field in gammas with an accuracy of + 2 gammas.

To correct for diurnal drift base station readings along the base line were established. This was done by first reading the base line at the intersection of all cross lines, this value would be considered a base station reading for each line. When the cross lines were read the reading at the base line and the original base station were compared and the readings for each line were corrected for drift.

All data was plotted on base maps on a scale of 1:5000 or 1 cm = 50 m. A base value of 58,000 gammas was subtracted from all readings with the difference between the actual reading and 58,000 gammas being the value plotted. The data was then contoured at 100 gamma intervals.

## VLF SURVEY

The VLF survey was conducted using a Geonics EM-16 VLF instrument. All lines were read at 25 meter intervals, recording both the percent dip of the electromagnetic field, or in phase component, of the field and the out of phase or quadrature component of the electromagnetic field.

All data was plotted on a base map on a scale of 1:5000 or 1 cm = 50 meters.

All the inphase components were reduced by the Fraser Filter method of data reduction for VLF data. This data was also plotted on a scale of 1:5000. The Fraser Filter data was then contoured at 10 unit intervals.

## Results of the Geophysical Surveys.

The most obvious geophysical feature is the magnetic anomaly which strikes northwest from line 18+00S 4+00E to line 0+00 3+00W. This is a striking magnetic anomaly which averages approximately 500 gammas higher on the southwest side of the anomaly relative to the northeast side of the anomaly.

The magnetic anomaly is subparallel to a weak VLF anomaly between line 18+00S and line 9+00S.

Weak VLF anomalies are noted to be more prominent on the southwest side of the magnetic anomaly. These weak VLF anomalies are noted to be associated with low magnetic anomalies in the order of 100 to 200 gammas anomalies.

These weak VLF anomalies are noted between line 9+00S and 12+00S from 2+00W to 2+50W; between line 9+00S and 10+00S from 3+00W to 3+50W; between line 13+50S and 18+00S from 4+00W to 4+75W.

Other weak VLF anomalies with partially associated magnetic anomalies of about 100 gammas occur between line 4+50S and 7+50S from 1+25W to 1+75W; between line 7+50S and line 10+50S from 2+50E and 2+75E.

A weak VLF anomaly between line 0+00 and 3+00S from 3+00E to 3+25E occurs coincident with a 1000 gamma magnetic anomaly.

GEOCHEMISTRY

Geochemical surveys were carried out in the Driftwood River Valley on the Peteka 3 and 4 Claims and on the Peteka 1 and 2 Claims.

On the Peteka 3 and 4 Claims 368 soil samples were collected in a systematic grid pattern to evaluate the drift covered Driftwood River Valley between the two mountainous ridges. On the Peteka 1 and 2 claims samples were collected along contour traverses to evaluate these areas.

All samples were collected from the "B" horizon along pace and compass lines. On the grid on Peteka 3 and 4 samples were collected from lines spaced 150 meters apart and samples were collected at 50 meter spacings. On the Peteka 1 and 2 Claims samples were collected at 50 meter intervals on these pace and compass lines.

All samples were shipped to Apex Analytical Laboratories in Calgary and analysed for copper, lead, zinc, gold, silver and arsenic.

The geochemical survey was designed to test for anomalous precious and base metals which may be associated with economic concentrations of gold and silver.

STATISTICAL ANALYSIS

Statistical analysis was carried out for the elements copper, lead, zinc, gold and silver, no statistical analysis was completed for arsenic because of the fact that only semi-quantative analysis was completed for this element, thus making any statistical treatment invalid.

Statistical analysis consisted of the construction of histograms of the frequency distribution of the analytical results. A "best" fit normalized curve was drawn on the histogram to define the "normal" population. The analytical results above this population were considered anomalous. Also the 95 percentile level of the "normal" population was considered to be the threshold level for the element.

The following table summarizes the results of the statistical analysis. All values are in ppm except gold which is in ppb

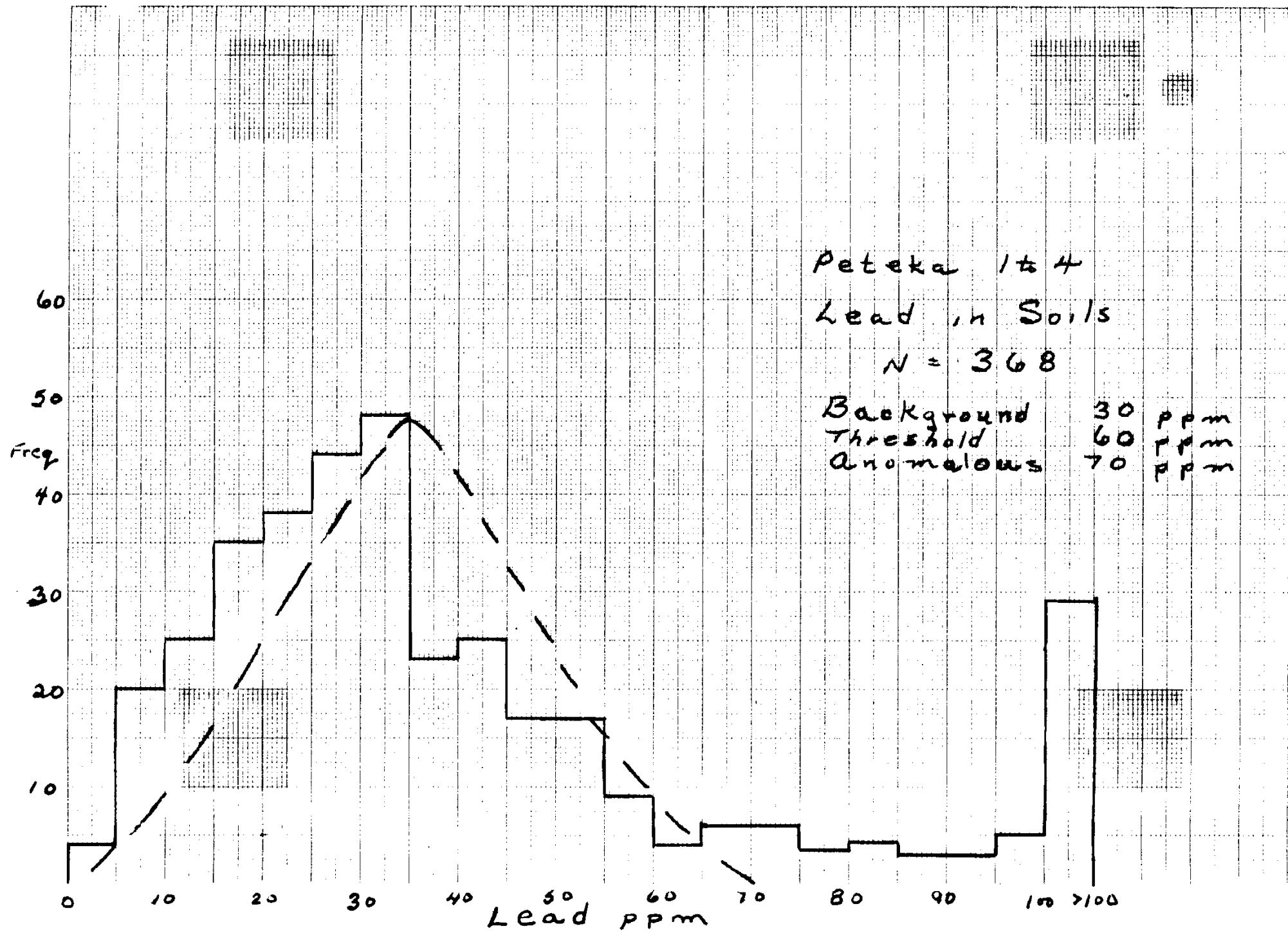
TABLE I SUMMARY OF STATISTICAL RESULTS

<u>ELEMENT</u>	<u>BACKGROUND</u>	<u>THRESHOLD</u>	<u>ANOMALOUS</u>
Copper	30	80	100
Lead	30	60	70
Zinc	60	160	180
Gold	>5	30	40
Silver	0.1	0.7	1.0

Zinc PPM

401516

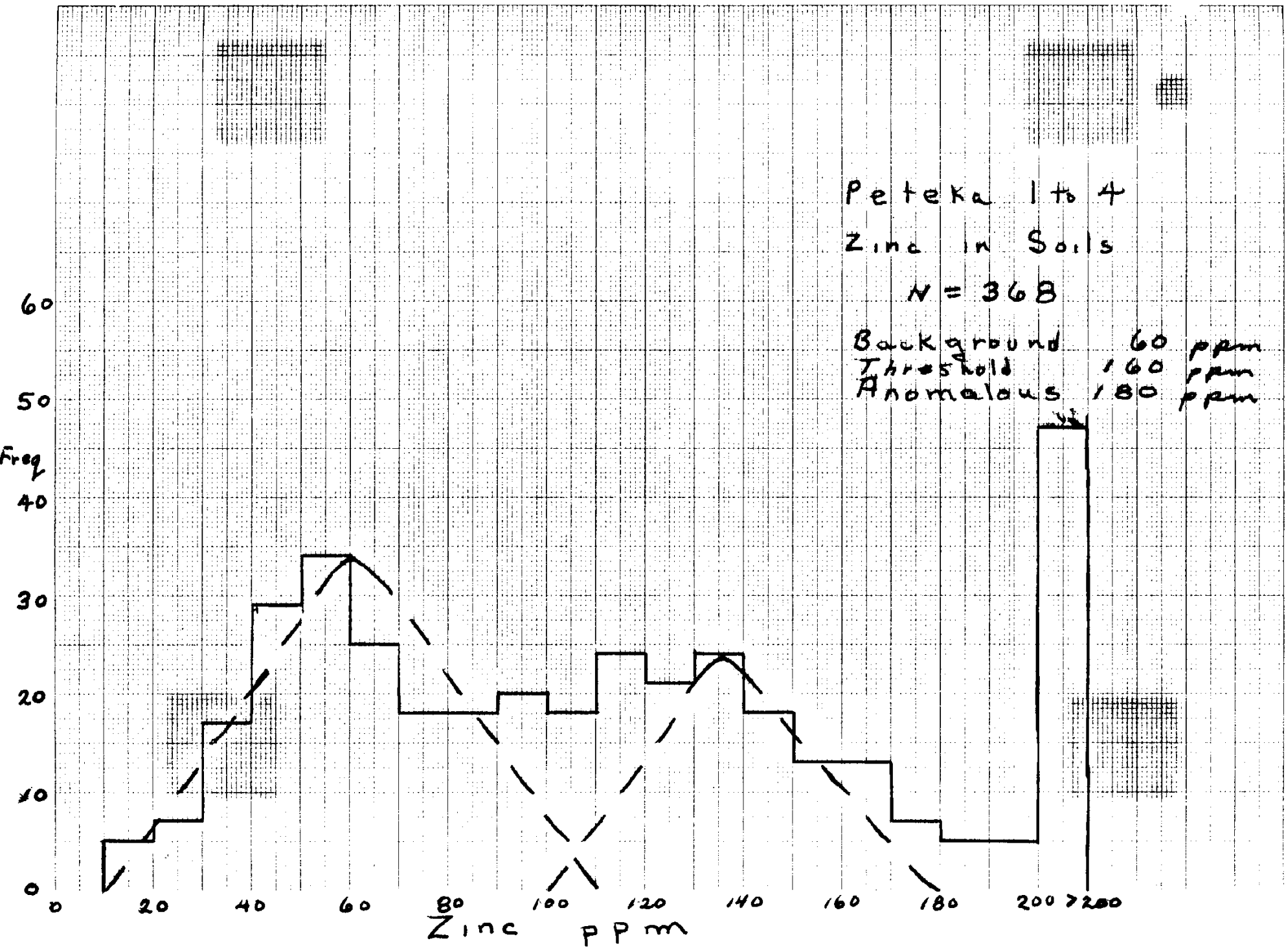


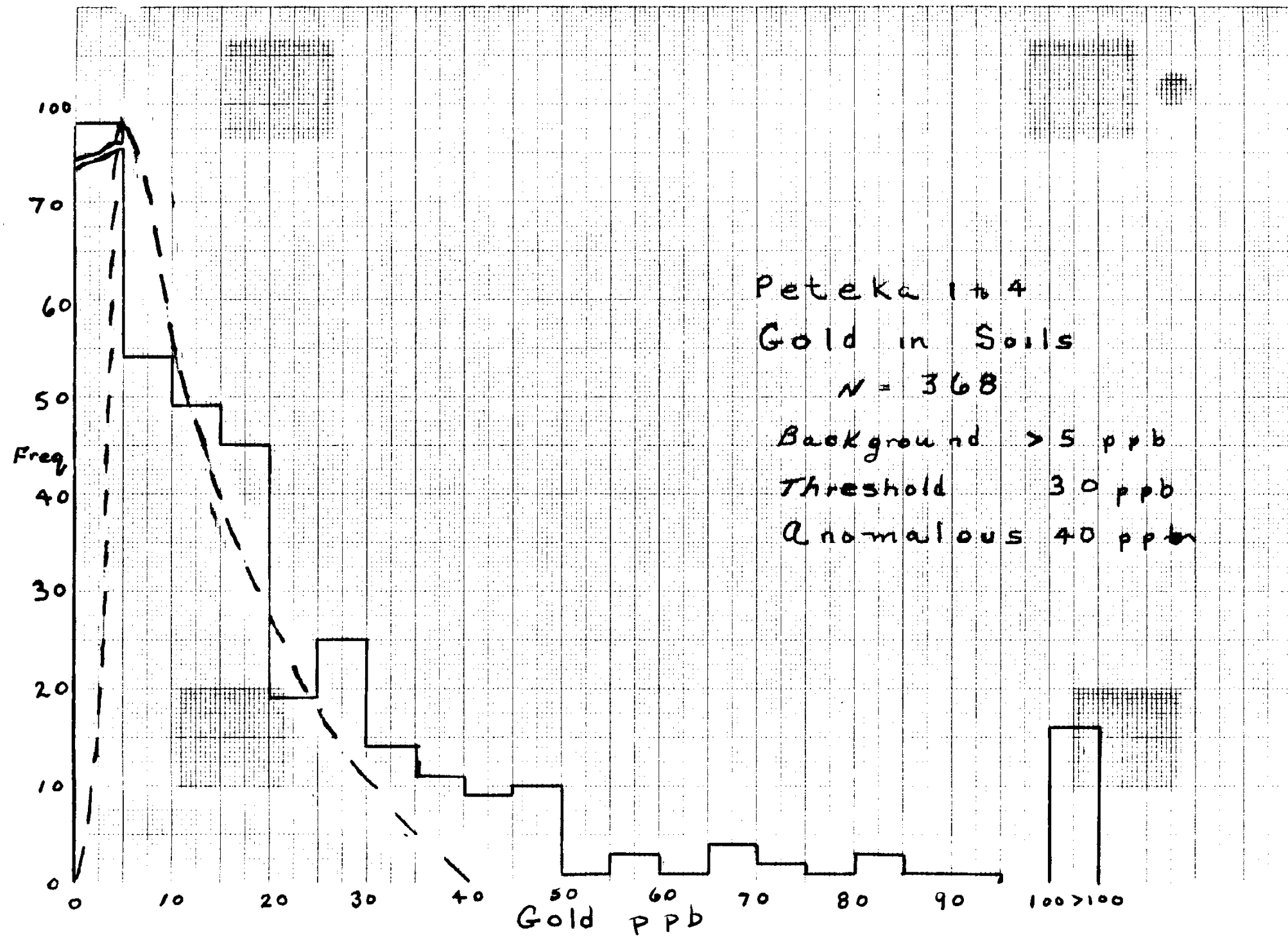


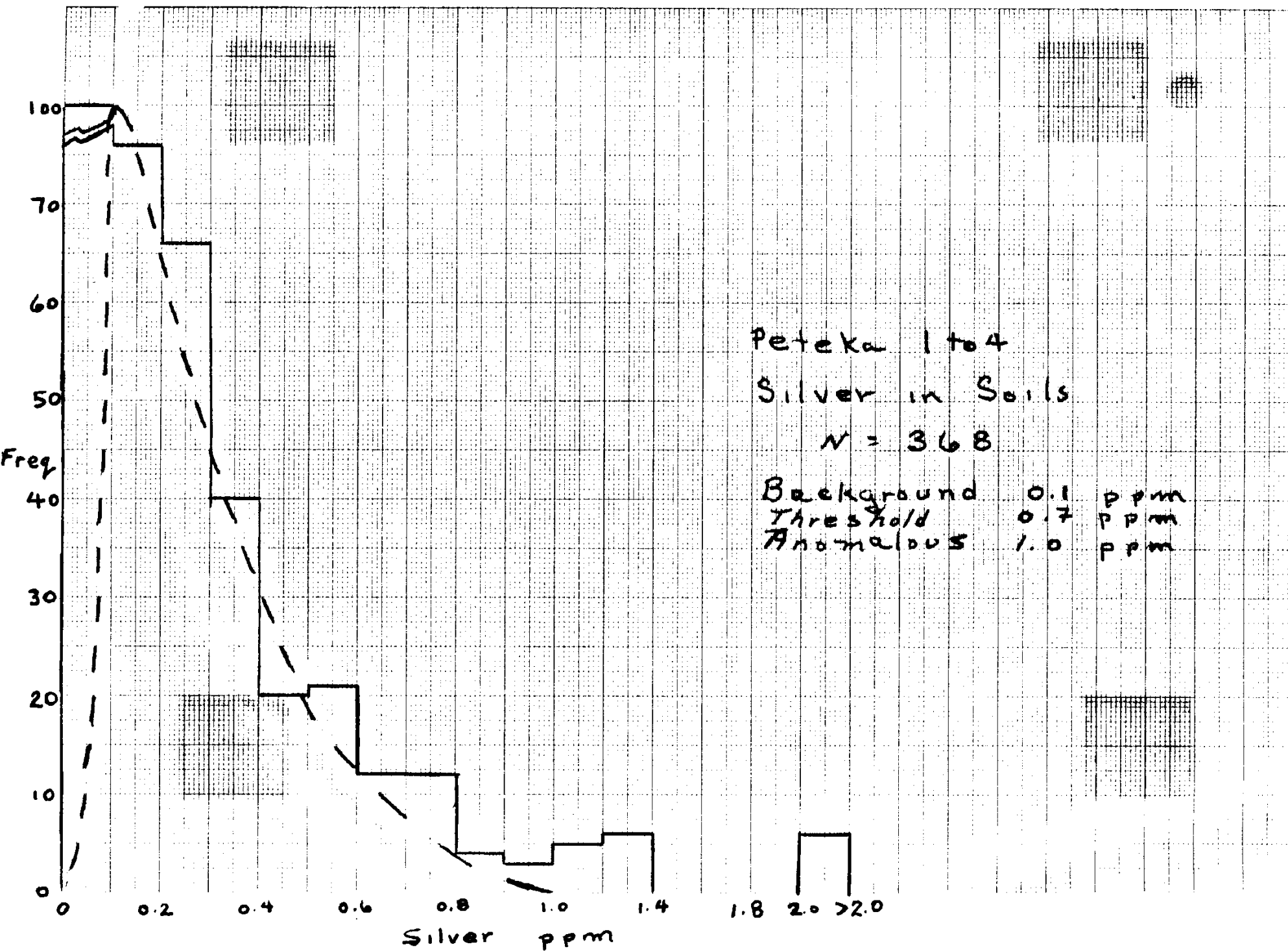
Peteka 1 to 4  
Zinc in Soils

N = 368

Background 60 ppm  
Threshold 160 ppm  
Anomalous 180 ppm



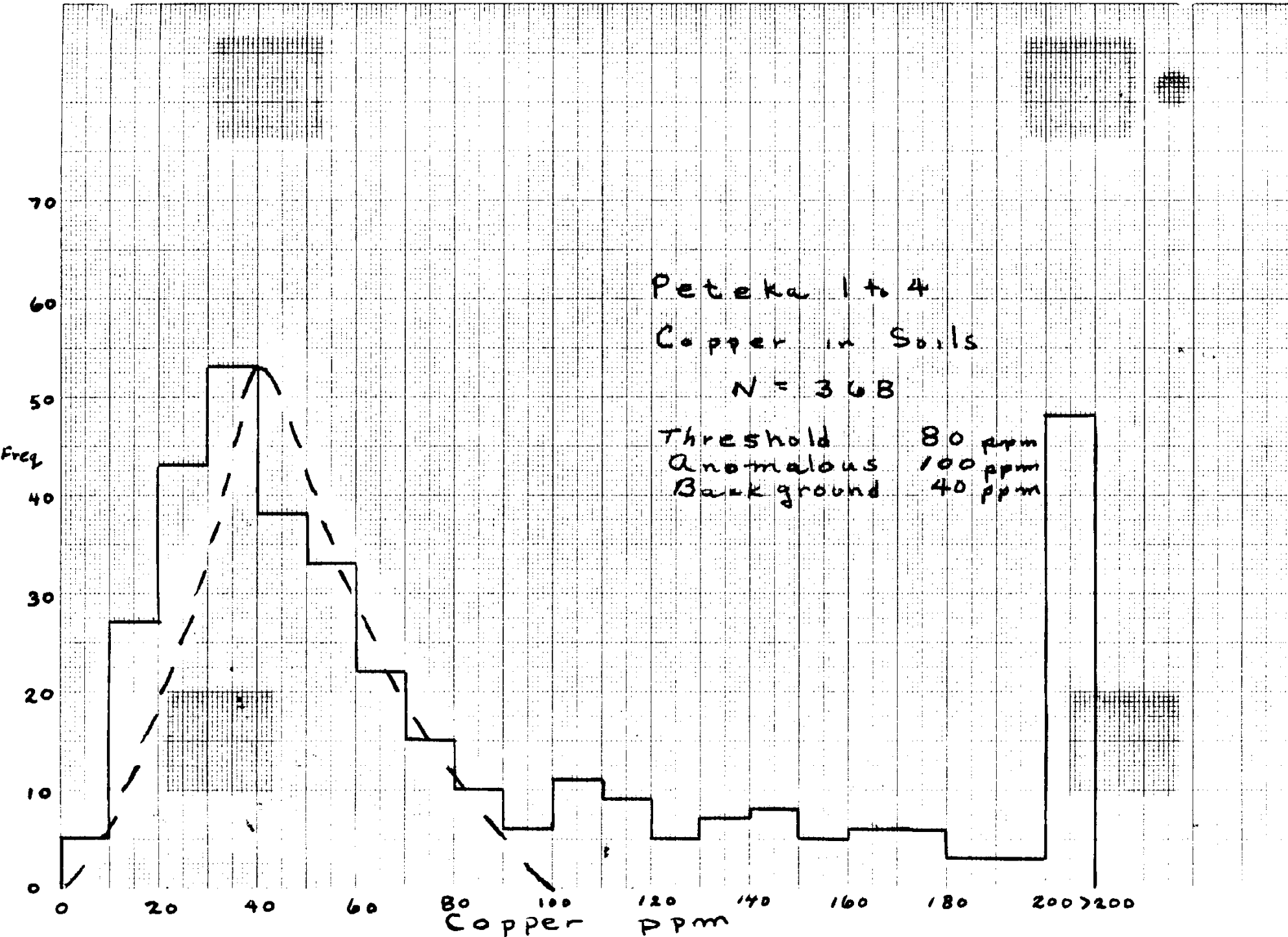




Peteka 1 to 4  
 Silver in Soils  
 N = 368

Background 0.1 ppm  
 Threshold 0.7 ppm  
 Anomalous 1.0 ppm

Silver ppm  
 461516



91GT 9+

## GEOCHEMICAL ANOMALIES AND RESULTS

The geochemical anomalies will be discussed for most part concerning the gold geochemical anomalies and other base metal anomalies associated with these precious metal anomalies.

The most distinct visual effect of the geochemical anomalies are the three broad and well defined anomalies.

The largest and broadest anomaly occurs between line 9+00S and line 16+00S from 2+00W to 6+00W. Anomalous soil samples in this area range from 40 ppb to 1080 ppb Au. This anomaly is coincident and flanking to widespread anomalous copper, lead and zinc soil anomalies in this area. Silver values here are only slightly anomalous and tend to be somewhat erratic.

The explanation for the geochemical anomaly is the likelihood of the anomaly being topographically downslope from the well mineralized fractures and joints which occur in the rocks along the ridges on the west of the Driftwood River. The mineralization within the joints and fractures was found to contain economic concentrations of copper, gold and silver in isolated grab samples.

One other geochemical anomaly occurs on the west side of the Driftwood River between 9+00S and 12+00S from the base line to 1+50W on lines 9+00S and 10+50S and one anomalous sample on line 12+00S located 1+50W. Anomalous gold values here range from 36 ppb to 186 ppb Au. No associated basemetal anomaly or silver anomaly is noted to occur with this anomaly.

No explanation for the gold anomaly can be offered at this time. The anomaly occurs in the drift covered area of the Driftwood River Valley. It should be noted, however, that the anomaly occurs coincident with the magnetic break which occurs between the northeast and southwest sections of the grid.

The third significant gold geochemical anomaly occurs between lines 4+00S and 10+50S from 1+00E and 1+50E. The anomaly occurs on the east side of the Driftwood River along the east ridge. The gold values range from 34 ppb to 1405 ppb Au. No directly associated base metal anomaly is noted to be coincident with this precious metal anomaly. A very weak slightly anomalous silver anomaly is coincident with this gold anomaly. Silver values range from 0.6 ppm to 0.8 ppm Ag.

A very strong, broad base metal anomaly is noted to occur between lines 1+50S and 10+50S between the base line and the east end of all these lines. Copper values range from 112 ppm to 2870 ppm Cu, lead values from 16 ppm to 942 ppm Pb, and zinc values 161 ppm to 2400 ppm Zn. This very broad base metal anomaly is flanking to the eastern gold anomaly both east gold anomaly and north of the gold anomaly.

The explanation for the above base metal anomaly has not been determined. Geologically the area as interpreted from Lord (1948) is underlain by mafic to intermediate volcanics of the Hazelton Group. The area is considered to have favourable host rocks for massive sulphide deposits. However, this thesis remains to be verified.

The one other geochemical anomaly of possible economic significance is located between line 24+00S and line 25+50S between 0+50W and 1+00E on line 24+00S and between 0+50E and 3+00E on line 25+50S. Gold values in soil samples range from 21 ppb to 360 ppb Au. Coincident anomalous copper, lead and zinc values also occur in this area. No anomalous silver values are noted to occur in this area.

Other isolated, one sample, gold anomalies are noted to occur throughout the grid. The samples are noted to be concentrated in the northern portion of the grid. These samples may be related to mineralized boulders in this area and may represent a mineralized boulder train from the mineralized fractures and shears which occur west and northwest of the grid area.

Geochemical sampling on the Peteka 1 and 2 Claims was limited to contour soil sample lines due to the very rugged topography in this region. Contour soil sample traverses were completed on the east and west side of the lake at the headwaters of the Driftwood River on Peteka 1. Also soil sampling paralleling the stream in the northeast section of Peteka 2 was sampled.

Two apparently significant gold anomalies were located.

One gold geochemical is located west of the lake on the Peteka 1 claim. Five soil samples define anomalous area approximately 600 meters long. Anomalous gold values range between 21 ppb and 582 ppb Au. Silver values in the same area range from 0.3 ppm to 0.6 ppm Ag. Copper values are anomalous ranging from 121 ppm to 330 ppm Cu. Three samples contain anomalous lead values of 61 ppm to 134 ppm Pb. Zinc values are observed to be background values of 50 to 70 ppm Zn.



The explanation of the geochemical anomaly would appear to be that the anomaly is related to mineralized fractures and shear zones located to the west and northwest of the anomalous zone. Several mineralized fractures containing significant chalcopyrite, and hematite with gold and silver credits were located in this area during geological mapping and prospecting.

The other precious metal geochemical anomaly is located in the northeast section of the Peteka 2 Claim. The anomaly is located on the west side of the major stream on this claim, and northeast the lake. The soil anomaly has outlined an area at least 600 meters long with the anomaly open to the east. Anomalous soil samples contain 31 ppb to 497 ppb Au with one soil containing a spectacular 3428 ppb Au (0.067 oz/ton Au). Anomalous silver values range from 0.7 ppm to 6.2 ppm Ag, although not all samples containing anomalous gold are anomalous in silver, but many are, and the silver anomaly outlines approximately the same area.

The base metal anomaly is also coincident with the precious metal anomaly. Copper in soil samples contain from 97 ppm to 5260 ppm Cu. Lead anomalies, although somewhat more erratic than copper and gold, contain anomalous lead concentrations ranging from 68 ppm to 4920 ppm Pb. Zinc values are typically only slightly anomalous ranging from 150 to 200 ppm Zn, although one sample does contain 1280 ppm Zn.

The probable explanation for this anomaly appears to be chalcopyrite - galena mineralization associated with quartz-carbonate veins in volcanic rocks. The sulphide mineralization occurs as open space vug filling and fracture filling with the quartz carbonate.

## SUMMARY AND CONCLUSIONS

The Peteka 1 to 4 claims are underlain by the Lower to Lower Middle Jurassic mafic to intermediate volcanic rocks belonging to the Hazelton Group. The Hazelton Group in the vicinity of the Peteka consists predominantly of tuffs and agglomerates and include a wide variety of dominantly purple to grey-green rocks of probable andesite composition. Minor mafic lava flows which are typically porphyritic with phenocrysts of plagioclase and/or hornblende were also locally observed, amygdaloidal lava flows were rarely observed. Minor cherty and siliceous interflow sediments were occasionally observed between volcanic flows.

Mineralization in fracture are joint controlled and occurs as veins and fracture filling in these joints and fractures. Mineralization consists of massive specular hematite veins with widths up to 1.5 meters. Sulphide mineralization consists of vug and open space fillings within the hematite and fracture filling adjacent to the specular hematite.

Several of these mineralized fracture zones contained significant amounts of copper with occasional economic concentrations of gold and/or silver in grab samples collected from these mineralized sections.

The geophysical surveys, magnetometer and VLF surveys were completed on the Peteka 3 and 4 Claims in the Driftwood River Valley. The most significant result of the geophysical survey is the outlining of the two separate magnetic signatures between the rocks in the northeast section and southwest section. The rocks in the southwest have a magnetic response approximately 500 gammas higher than the northeast section of the grid. A weak VLF anomaly is coincident with the magnetic anomaly between the northeast and southwest sections.

Other weak VLF anomalies were also located on the grid. No explanation for these anomalies was located. However, it seems probable that they are related to major joint and fracture systems on the Peteka claims.

The soil geochemical survey was successful in locating several zones containing anomalous gold and base metal values. These anomalous zones appear to be related to mineralization with the fractures and joints within the volcanic rocks. Several of the geochemical anomalies remain unexplained.

The geochemical anomalies on the east side of the Driftwood River are unexplained as well as the anomaly near the southern boundary of the Peteka 3 and 4 claims.

Two apparently significant geochemical anomalies were located on the Peteka 1 and 2 claims. These anomalies are probably related to fracture and joint filling mineralization found in the vicinity of these anomalies.

Recommendations for future work on the Peteka claims includes detail geological mapping of the areas outlined by the anomalous geochemical samples, detail geological mapping to define structure and fracture joint systems. Extensive geochemical surveys on the Peteka 2 claim in the northeast to better define the anomalies in this area. Geophysical surveys including both magnetometer and VLF surveys in areas where topography permits. These programs should be followed by trenching and diamond drilling to access the veins, and fracture systems for continuity at depth.

## RECOMMENDATIONS

As a result of the 1985 exploration program a detail follow-up exploration program is recommended.

1. Detail geological mapping and prospecting in the northeast portion of the Peteka 2 Claim, on the east side of the Driftwood River and west of the lake on the Peteka 1 Claim.
2. Detail geochemical sampling in the northeast area of the Peteka 2 claim to define the geochemical anomaly in this area.
3. Detail geological mapping, sampling, and trenching of mineralized fractures and joints located during the 1985 program.
4. Geophysical surveys, consisting of magnetometer and VLF surveys to outline major joint and fracture systems as well as to define geology in the drift covered areas.
5. Trenching and sampling in areas where mineralized fractures and joint are located.
6. Diamond drilling to define the width and continuity of mineralization at depth should be completed upon completion of the above mentioned surface exploration program. A diamond drilling program of 1000 to 2000 meters would likely be required to examine these numerous fracture and joint vein systems.

REFERENCES

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AUTHORS QUALIFICATONS

I Charles J. Hartley, of Apt. 302, 325 - 2 Avenue N.E., in the City of Calgary in the Province of Alberta do certify that:

1. I am a geologist employed with the Coal and Minerals Department of Suncor Inc. Resources Group with offices located at 500 - 4 Ave. S.W., Calgary, Alberta
2. I am a graduate of St. Francis Xavier University, B.Sc. Major Geology (1977).
3. I have worked in the field of mineral exploration since 1975.
4. I have personally worked on the claims and supervised exploration work carried out there and described in this report.
5. I have not received and do not expect to receive any interest, directly or indirectly, in the properties described herein nor in the securities of Suncor Inc. Resources Group in respect of services rendered in the preparation of this report.

Respectfully submitted,

Charles Hartley

APPENDIX I

ROCK SAMPLE DESCRIPTIONS

PETEKKA 1-4 - ROCK SAMPLE DISCRIPTION

<u>SAMPLE NO.</u>	<u>DESCRIPTION</u>
PK2201 (PK-WF-4)	Silicia rock intermediate to mafic volcanic with abundant medium to coarse grained specularite in veins and aggregates, minor pyrite and chalcopyrite.
PK2202 (PK-WF-5a)	Near massive specularite vein with fine to medium grain specularite. Sample contains medium grained quartz and fragments of clay altered volcanics.
PK2203 (PK-WF-5b)	Sheared silicified mafic volcanic containing veins and stringers of massive medium to coarse grained specular hematite and chalcopyrite, minor malachite.
PK2204 (PK-WF-6)	Shear zone in chlorite and clay altered mafic volcanics, 2 to 10 mm wide specular hematite stringers with fine to medium grained specularite; 10-15% fine to medium grained pyrite in host quartz rich volcanic.
PK2205 (PK-WF-7)	Fracture zone in mafic volcanic rocks - mineralization includes 1-2 cm wide specular hematite and carbonate veins, volcanic rocks contains disseminated fine to medium grained pyrite and chalcopyrite, locally as vug infilling.



PETKA 1-4 - ROCK SAMPLE DISCRIPTION

<u>SAMPLE NO.</u>	<u>DESCRIPTION</u>
PK2206 (PK-WF-8)	Shear zone in weakly chloritized mafic volcanics, stringers and veins of fine to medium grained specular hematite and quartz, minor malachite staining along fractures, trace chalcopryrite.
PK2207 (PK-WF-9)	Silicified shear zone in clay altered mafic volcanics, mineralization consists of veins and stringers of medium to coarse grained specular hematite containing coarse grained rounded calcite crystals. Minor associated pyrite and chalcopryrite.
PK2208 (PK-WF-10)	Shear zone is silicified weakly carbonatized volcanic, approximately 15% fine to medium grained specularite in quartz-carbonate rich vein, minor malachite staining.
PK2209 (PK-WF-11)	Carbonatized shear zone in mafic volcanic host rock, irregular veins, stringers and pods of medium to coarse grained specular hematite and chalcopryrite. Chalcopryrite locally brecciated, abundant malachite staining.
PK2210 (PK-WF-12)	Carbonatized shear zone in silicified mafic volcanic, mineralization consists of fine grained hematite and possibly tetrahedrite in stringers and blebs, abundant malachite staining.

PETEKKA 1-4 - ROCK SAMPLE DISCRIPTION

<u>SAMPLE NO.</u>	<u>DESCRIPTION</u>
PK2211 (PK-SS-6)	Shear zone in chloritized mafic volcanic, calcite and specular hematite bearing veins and stringers with up to 80% medium to coarse grained specular hematite, medium to coarse grained blebs of chalcopryrite in volcanic host rock.
PK2212 (PK-CH-3)	2 m wide shear zone in mafic volcanic host, quartz bearing specular hematite vein, medium to coarse grained, containing open space fillings of quartz and fragments of altered volcanics.
PK2213 (PK-CH-4)	Vein in silicified mafic volcanic rocks, medium to coarse grained near massive specular hematite vein containing grained chalcopryrite. Silicified volcanic fragments are also present in the vein.
PK2214 (PK-CH-5)	Silicified mafic volcanic from shear zone, with trace fine disseminated cubic pyrite.
PK2215 (PK-CH-12)	Silicified mafic volcanic from shear zone with trace disseminated pyrite.
PK2216 (PK-CH-13)	Massive coarse grained specular hematite vein in slightly chloritic and silicified mafic volcanic fragmental, minor quartz-carbonate.

PETEK 1-4 - ROCK SAMPLE DESCRIPTION

<u>SAMPLE NO.</u>	<u>DESCRIPTION</u>
PK2217 (PK-CH-15)	Massive specular hematite vein with local abundant chalcopyrite as vug infilling, malachite staining common. Host mafic volcanic, slightly chloritic and silicified.
PK2218 (PK-CH-16)	Host mafic volcanic with massive specular hematite vein with abundant 10-15% medium grained chalcopyrite as vug and open space filling.
PK2219 (PK-SS-09)	Fine to medium grained intermediate volcanic with 3-5cm specular hematite vein with 1 cm width of massive chalcopyrite.
PK2220 (PK-SS-19)	Felsic to intermediate volcanic with quartz-carbonate vein with 10-12% chalcopyrite disseminated and vug filling.
PK2221 (PK-SS-21)	Float, Quartz-carbonate vein with abundant malachite and minor disseminated pyrite +chalcopyrite.
PK2222 (PK-SS-22)	Gossan sample, with chalcopyrite-galena vein 2-4 cm wide in quartz-carbonate, pyrite common. Intermediate volcanic host rock.

PETEKA 1-4 - ROCK SAMPLE DISCRIPTION

<u>SAMPLE NO.</u>	<u>DESCRIPTION</u>
PK2223 (PK-IS-2)	Mafic volcanic with moderate to intense chlorite alteration, containing trace pyrite disseminated and fracture coating. Alteration, intense argillic and minor silicification.
PK2224 (PK-WF-1)	Specular hematite vein in intermediate volcanic with quartz-carbonate. Chalcopyrite occurs in vugs and open space filling, abundant malachite stain. Minor calcite open space filling.
PK2225 (PK-WF-2)	Silicified mafic volcanic with abundant quartz, hematite alteration, minor carbonate, minor malachite, azurite staining in vugs and on fracture surface.
PK2226 (PK-WF-3)	Massive medium to coarse grained specular hematite.
PK2227 (PK-WF-13)	Silicified intermediate volcanic, with vugs with cubic pyrite infilling, alteration silica and red hematite staining.

PETEKA 1-4 - ROCK SAMPLE DISCRIPTION

<u>SAMPLE NO.</u>	<u>DESCRIPTION</u>
PK2228 (PK-WF-14)	Intermediate to mafic volcanic, very fine grained, intense chlorite alteration, minor silicification, minor to moderate malochite and azurite staining, trace disseminated chalcopryrite, pyrite on fracture surfaces.
PK2229 (PK-WF-15)	Intermediate volcanic with 1-2 mm chalcopryrite vein and malachite stain on fracture surfaces, trace disseminated pyrite. Alteration chlorite, minor silicification, argillic.
PK2230 (PK-WF-16)	Intermediate fine graned volcanic with 2-3 cm massive specular hematite vein, trace chalcopryrite, pyrite with moderate to abundant malachite staining.
PK2231 (PK-WF-17)	Silicified intermediate volcanic with 1 cm quartz vein and calcite on fractures, chalcopryrite open space filling and along quartz vein host rock contact, trace pyrite, alteration includes chlorite, quartz carbonate.
PK2232 (PK-WF-18)	Mafic to intermediate volcanic fine grained 3-4% chalcopryrite open space and fracture filling with 1 cm quartz vein with chalcopryrite minor malachite staining alteration hematite, chlorite and quartz-

PETKA 1-4 - ROCK SAMPLE DISCRIPTION

<u>SAMPLE NO.</u>	<u>DESCRIPTION</u>
PK2233 (PK-WF-19)	Massive white calcite vein with chalcopryrite vug infilling and malachite staining common.
PK2234 (PK-WF-20)	4-6 cm massive white calcite vein with trace vug filling chalcopryrite and trace fracture coating chalcopryrite and malachite staining. Trace fracture filling specular hematite.
PK2235 (PK-WF-21)	Mafic volcanic, dark grey, fine grained, chloritic with narrow 1-2 quartz-carbonate vein with open space filling chalcopryrite and fracture coating malachite stain, trace fracture filling specular hematite.
PK2236 (PK-WF-22)	Mafic to intermediate volcanic dark grey green with calcite vein abundant open space filling coarse grained chalcopryrite with malachite staining. Alteration chlorite and minor red hematite staining.
PK2237 (PK-WF-23)	2-4 cm calcite vein in chloritic mafic volcanic, minor chalcopryrite vug filling with moderate to abundant malachite in vugs. Iron staining on fracture surfaces.
PK2238 (PK-WF-24)	Quartz-calcite vein in mafic volcanic with abundant open space filling chalcopryrite with minor malochite staining. Alteration red hemotite silicification, chlorite and argillic.

PETEK 1-4 - ROCK SAMPLE DISCRIPTION

<u>SAMPLE NO.</u>	<u>DESCRIPTION</u>
PK2239 (PK-WF-25)	Quartz vein in mafic volcanic with minor vug filling chalcopryrite and moderate malachite stain.
PK2240 (PK-WF-26)	Red grey intermediate volcanic with abundant calcite, trace vug and open space filling chalcopryrite.
PK2241 (PK-WF-27)	8-10 cm quartz-calcite vein with chalcopryrite, specular hematite vug filling, chalcopryrite often specular hematite, malachite stained. Trace galena.
PK2242 (PK-WF-28)	Quartz-calcite-specular hematite vein in chloritic specular hematite vein, trace chalcopryrite vug filling in vein with trace bornite.
PK2243 (PK-WF-30)	Quartz-carbonate vein up to 1 meter wide with chalcopryrite, specular hematite as open space filling with abundant country rock in vein (brecciated).
PK2244 (PK-WF-31)	Mafic volcanic with quartz-calcite vein with fracture filling specular hematite with trace vug filling chalcopryrite.

PETEKKA 1-4 - ROCK SAMPLE DISCRIPTION

<u>SAMPLE NO.</u>	<u>DESCRIPTION</u>
PK2244 (PK-WF-31)	Mafic volcanic with quartz-calcite vein with fracture filling specular hematite with trace vug filling chalcopryrite.
PK2245 (PK-CH-4)	Mafic volcanics associated with sample PK-CH-4. Disseminated and fracture coating pyrite in silicified mafic volcanic.
PK2246 (PK-SS-25)	Small shear 10 cm wide, calcite and quartz associated with hematite vein. Vug filling chalcopryrite, malachite and hematite staining.
PK2247 (PK-SS-29)	Shear zone 20-40 cm wide. Massive specular hematite, abundant chalcite, minor hematite, abundant calcite, minor disseminated pyrite and chalcopryrite in silicified mafic volcanic.
PK2248 (PK-SS-31)	1.5 to 2 meter wide shear, massive hematite vein 30 cm, calcite associated with chalcopryrite localized along hematite-calcite contact.
PK2249 (PK-SS-42)	10 cm wide shear in silicified mafic volcanic. Disseminated and fracture coating chalcopryrite, malachite and azurite stained.



PETEK 1-4 - ROCK SAMPLE DESCRIPTION

<u>SAMPLE NO.</u>	<u>DESCRIPTION</u>
PK2261 (PK-SS-43)	5cm wide shear in mafic volcanics with calcite rich felsic vein. Prominent malachite, azurite stain. Trace disseminate chalcopryrite, and hematite.
PK2262 (PK-SS-49)	Mafic volcanic, disseminated pyrite, chalcopryrite, with malachite staining along fractures.
PK2263 (PK-BD-3)	Float, carbonate boulder with vug filling chalcopryrite and minor hematite, malachite, azurite and hematitic staining.
PK2264 (PK-IS-10)	Float, fine grained mafic volcanic with calcite vein containing hematite, chalcopryrite with abundant malochite staining.
PK2265 (PK-SS-44)	Mafic volcanic with minor disseminated pyrite, abundant limonite staining. Minor 1-2 mm carbonate stringers, minor epidote alteration.
PK2266 (PK-SS-45)	Epidotized felsic intrusive, intruding silicified mafic volcanic with grey quartz. Abundant iron staining.
PK2267 (PK-CH-17)	Massive specularite vein containing rounded to oval blebs, aggregates of chalcopryrite from 0.5 cm to 3 cm.

PETEKKA 1-4 - ROCK SAMPLE DISCRIPTION

<u>SAMPLE NO.</u>	<u>DESCRIPTION</u>
PK2268 (PK-CH-17)	Disseminated pyrite and stringers and fracture coatings in altered mafic volcanics, iron stained fractures, minor carbonate, part of extensive gossan zone on hillside.
PK2269 (PK-CH-10)	Shear zone in volcanics containing specular hematite veins to 10 cm as well as calcite, chalcopryrite veins 1 to 2 cm wide, some associated malachite.
PK2270 (PK-AS-1)	1 meter wide fracture zone in tuff containing fine grained disseminated pyrite, specular hematite over 0.5 m interval, locally 2-3% pyrite.
PK2271 (PK-AS-5)	1 meter wide shear zone in mafic volcanic, network of quartz, chlorite, charbonate veins containing specular hematite, chalcopryrite and malachite.
PK2272 (PK-AS-6)	Shear zone at contact of hematized tuff and felsic unit, specular hematite, calcite veins containing chalcopryrite in open space fillings and stringers.
PK2273 (PK-AS-7)	15 cm wide massive specular hematite vein with open space fillings of quartz containing fine grained disseminated pyrite. Host rock bleached, highly altered volcanic, some medium grained pyrite blebs.

PETKA 1-4 - ROCK SAMPLE DISCRIPTION

<u>SAMPLE NO.</u>	<u>DESCRIPTION</u>
PK2274 (PK-AS-8)	Bleached, intensely altered volcanic rock, host of DR2273, abundant disseminated pyrite, some pyrite concentrated along fractures.
PK2275 (PK-AS-9)	Silicified porphyritic volcanic from 5 m wide gossan zone at northwest end of large gossan contains abundant disseminated pyrite.
PK2276 (PK-AS-12)	Network of specular hematite stringers in altered carbonatized volcanic (2meter wide interval), blebs and aggregates of fine grained to medium grained pyrite supported in specular hematite.
PK2277 (PK-AS-14)	20 cm to 1 meter wide specularite vein, minimum 60 meter length, contains quartz-calcite stringers (pyrite bearing) with some fragments of silicified volcanic wall rock.
PK2278 (PK-AS-15A)	30 cm wide specular hematite vein exposed for 2 meters, vuggy specular hematite with coarse grained chalcopyrite infilling vugs (up to 10 cm long), also abundant pyrite.

PETKA 1-4 - ROCK SAMPLE DESCRIPTION

<u>SAMPLE NO.</u>	<u>DESCRIPTION</u>
PK2279 (PK-AS-15B)	Same vein as PK2278, but primarily chalcopyrite in open space fillings with fragments of host volcanic.
PK2280 (PK-AS-15c)	Same vein as PK2278, sample contains 4-5 cm wide open space filling of chalcopyrite in specular hematite.

APPENDIX II

ANALYTICAL RESULTS



Table with columns: ID (50 04185), Code (PK5361-5008), Value (5), Weight (0.1-0.6), Quantity (100), and Weighted Value (51.16-106.44).

Table with columns: ID (50 04185), Code (PK5509-5008), Value (5), Weight (0.4-0.6), Quantity (100), and Weighted Value (37.18-120.16).

Table with columns: ID (50 04185), Code (PK6270-6272), Value (5), Weight (0.4-0.3), Quantity (100), and Weighted Value (66.19-95.19).

Table with columns: ID (50 04185), Code (PK6374-6375), Value (5), Weight (0.1-0.2), Quantity (100), and Weighted Value (156.44-122.62).

Table with columns: ID (50 04185), Code (PK8236-8237), Value (29), Weight (0.1-0.2), Quantity (100), and Weighted Value (44.21-32.19).

Table with columns: ID (50 04185), Code (PK8407-8408), Value (48), Weight (0.9-0.3), Quantity (100), and Weighted Value (280.297-52.60).

Table with columns: ID (50 04185), Code (PK8489-8490), Value (5), Weight (0.1-0.1), Quantity (100), and Weighted Value (123.28-24.32).

..... END REPORT .....

.DATE 19 NOV 85 09:59:58 RID 78 24 SEP 85 MINERL  
 \*CHEMICAL LAB ANALYSIS REPORT FOR PROJECT:PETEKA 1-4 CLAIMS LAB : APX (TYPE F)  
 \*RS.PRJXR .ROCK.SAMPLE.AU .AG .CU .PB .ZN .AS  
 \* . . . . .NUMBER.AA PPB.AA PPM.AA PPM.AA PPM.AA PPM.AA PPM.AA

	NUMBER.AA	PPB.AA	PPM.AA	PPM.AA	PPM.AA	PPM.AA	PPM.AA
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50 06185	PK4106	5	0.2	174	85	215	100
50 06185	PK4107	19	0.2	128	30	129	100
50 06185	PK4108	46	0.1	99	40	96	100
50 06185	PK4109	14	0.1	247	44	150	100
50 06185	PK4110	29	0.1	276	39	120	100
50 06185	PK4111	14	0.2	270	24	162	100
50 06185	PK4112	5	0.1	158	30	116	100
50 06185	PK4113	5	0.1	211	9	165	100
50 06185	PK4114	5	0.1	247	14	160	100
50 06185	PK4115	7	0.2	56	9	96	100
50 06185	PK4116	9	0.1	26	6	63	100
50 06185	PK4117	19	0.1	16	8	42	100
50 06185	PK4118	14	0.1	68	142	66	100
50 06185	PK4119	19	0.5	148	24	146	100
50 06185	PK4120	12	0.3	170	46	161	100
50 06185	PK4121	5	0.2	244	30	204	100
50 06185	PK4122	21	0.3	196	51	191	100
50 06185	PK4123	5	0.4	143	46	160	100
50 06185	PK4124	50	0.2	78	25	130	100
50 06185	PK4125	19	0.1	246	11	148	100
50 06185	PK4126	25	0.3	44	13	112	100

..... END REPORT .....

GEOLOGICAL BRANCH  
ASSESSMENT REPORT

14,424



DATE 13:02:27 RID 84 26 NOV 85 MINERL  
 \*CHEMICAL LAB ANALYSIS REPORT FOR PROJECT: PETEKA 1 TO 4 LAB: APX (TYPE F)  
 \*RS:PRJVR .ROCK,SAMPLE.ZN .CU  
 \* . . . . .NUMBER.AA PPM,FAA PCT.  
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GEOLOGICAL BRANCH  
ASSESSMENT REPORT  
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50 04185 PK8527 70

.... END REPORT ....

APPENDIX III

ANALYTICAL METHODS

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 terner 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 or 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

- 1) Place 18 x 150 mm test tubes in aluminum digestion blocks.
- 2) Weigh 0.5 g of sample into test tubes.
- 3) Intersperse samples with blanks, checks and certified reference materials.
- 4) 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.
- 5) Add 2 ml conc.  $\text{HNO}_3$  and heat 40-45 minutes with hot plates set a 5. Cool.
- 6) Transfer to wire racks but leave aluminum blocks on hot plates.
- 7) Add 3 ml conc.  $\text{HCl}$ . Let sit 15-25 minutes.
- 8) Add 2 ml  $\text{H}_2\text{O}$  to the blanks.
- 9) 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.
- 12) Remove samples from aluminum blocks, transfer to wire racks and let cool.
- 13) Dilute to 10 ml with 1 N  $\text{HNO}_3$ : vortex and allow to stand for 3 hours.
- 14) Read on A.A. against similarly prepared standards.

NOTE: 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.

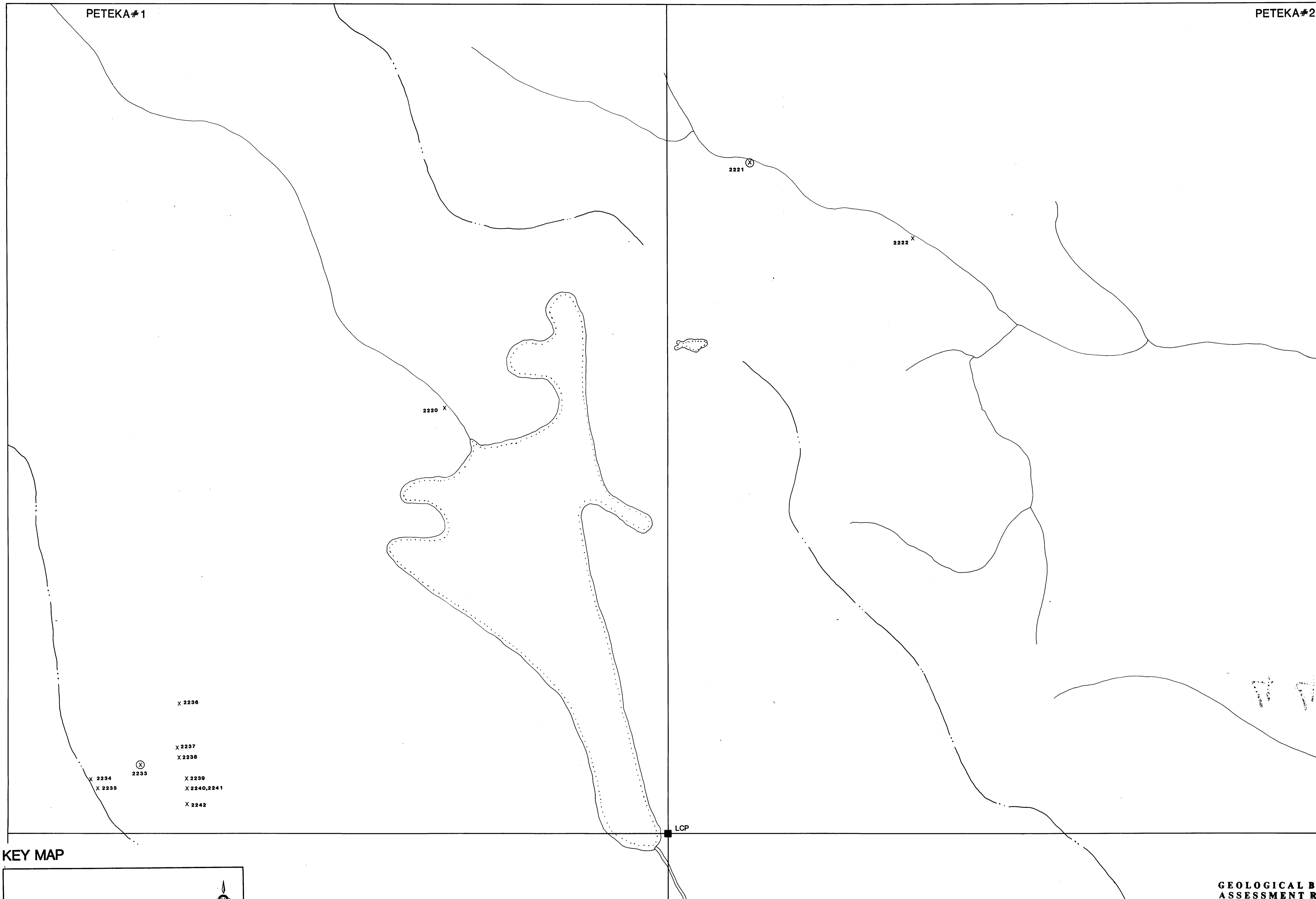
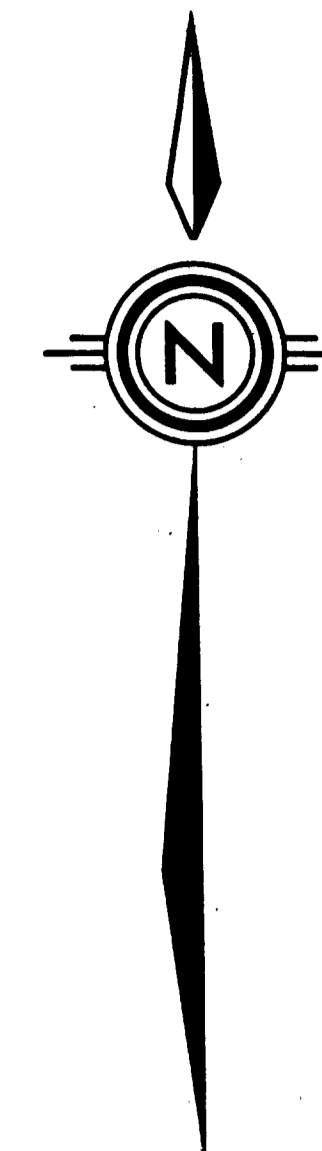
METHOD FOR THE DETERMINATION OF GOLD BY FIRE ASSAY

PRECONCENTRATION AND ATOMIC ABSORPTION ANALYSES

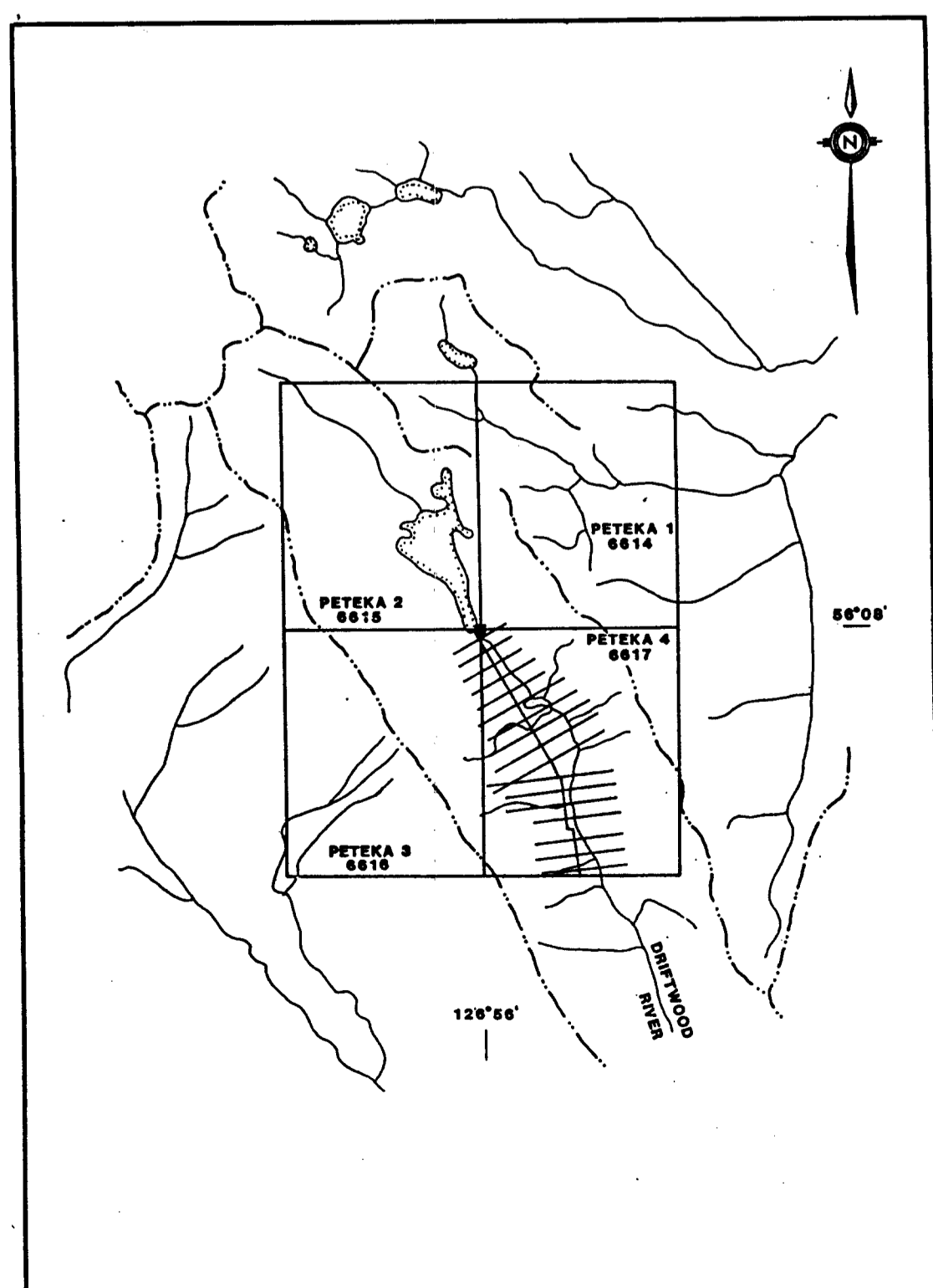
1. A 1 assay ton (29.166g) sample is weighed into a 30 g crucible, 1 mg of Ag is added as a collected agent.
2. Enough flux reducing or oxidizing reagent is added to produce a lead button.
3. The sample is transferred into an assay furnace and heated to 2000°F for 40-45 minutes.
4. The fusion is poured into a iron mould.
5. 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.
7. 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 HNO<sub>3</sub>, and 4 ml of 1:1 HCl are added to the tube.
10. The tube is heated on the hot plate for approximately 1 hour, or until all the residue is dissolved in the tubes.
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.

PETKA#1

PETKA#2

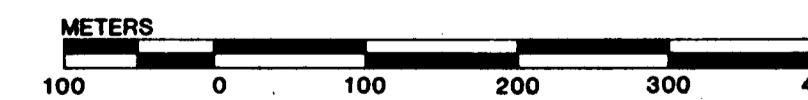


KEY MAP



GEOLOGICAL BRANCH  
ASSESSMENT REPORT

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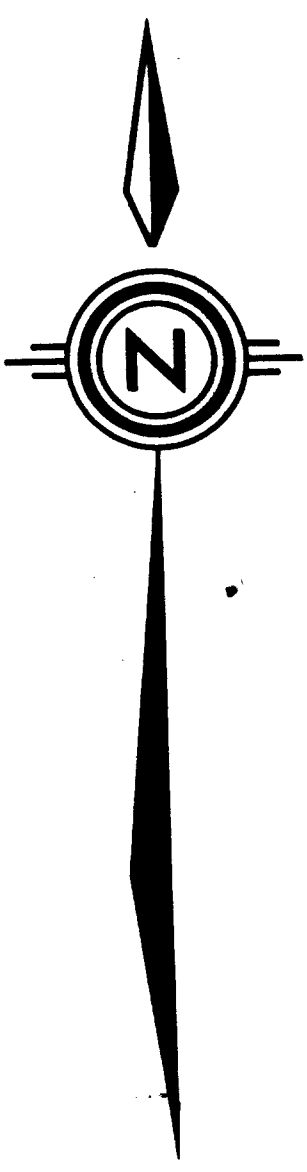


**Suncor** inc. Resources Group COAL AND MINERALS  
DEPARTMENT

**BEAR LAKE PROJECT**  
PETKA CLAIMS 1 & 2  
ROCK SAMPLE LOCATIONS

DATE AUGUST 1985	SCALE 1:5000	N.T.S. 94D/2E	DRAWING No. PT 001
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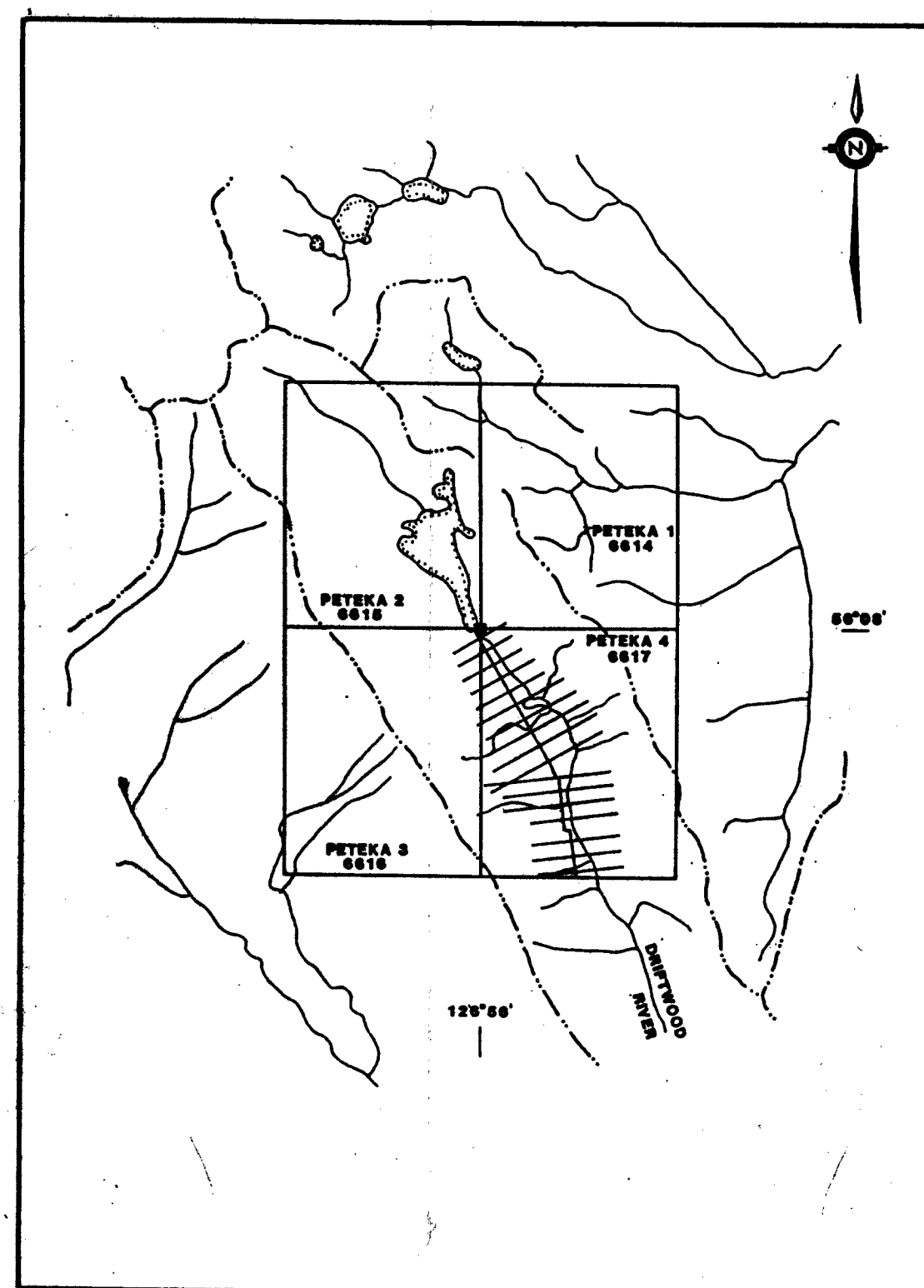


PETKA#3

PETKA#4

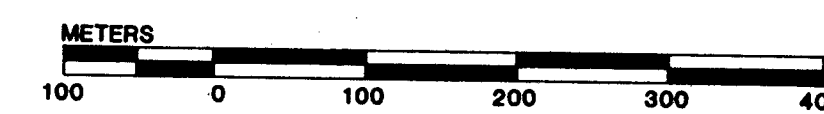


KEY MAP



GEOLOGICAL BRANCH  
ASSESSMENT REPORT

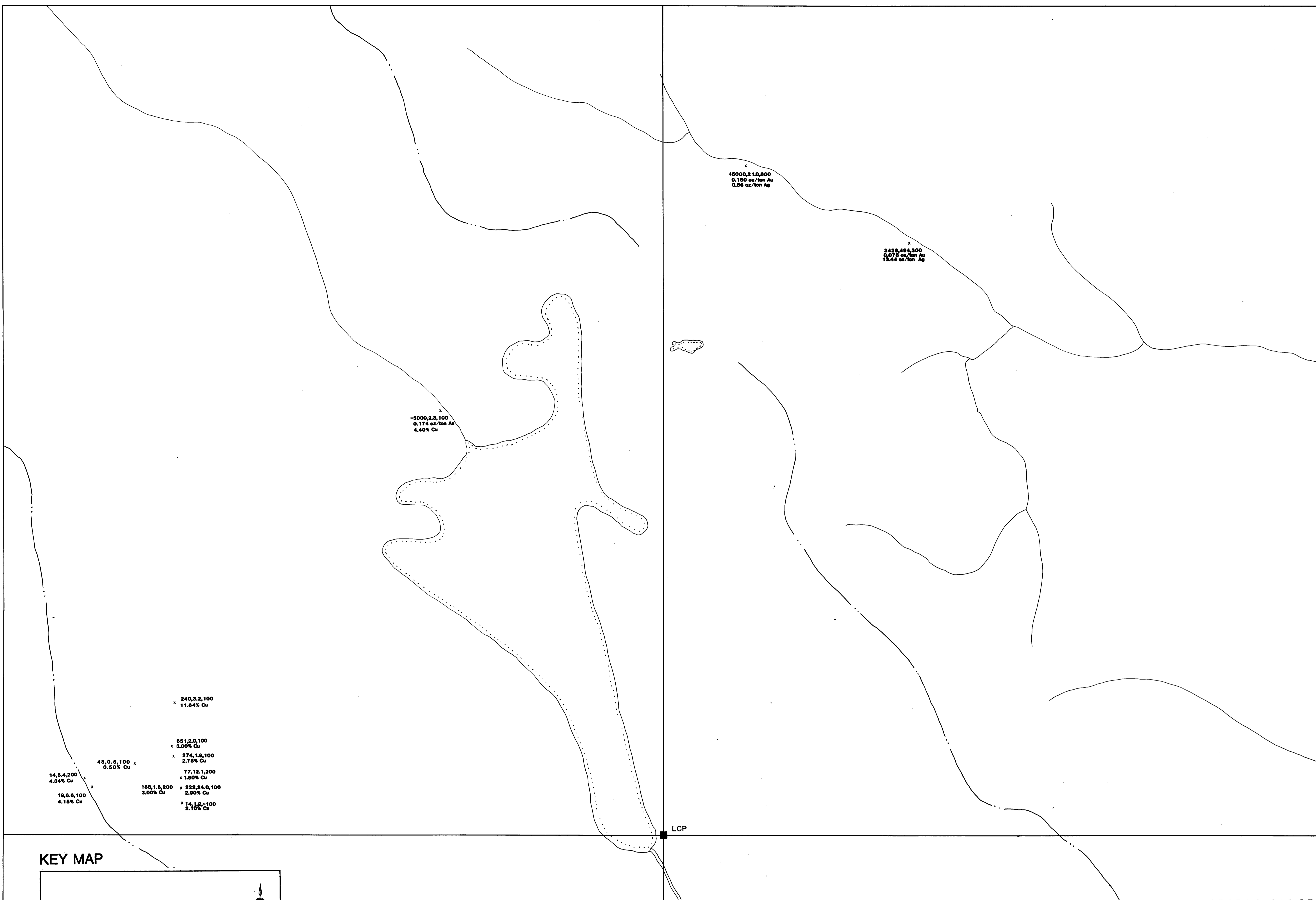
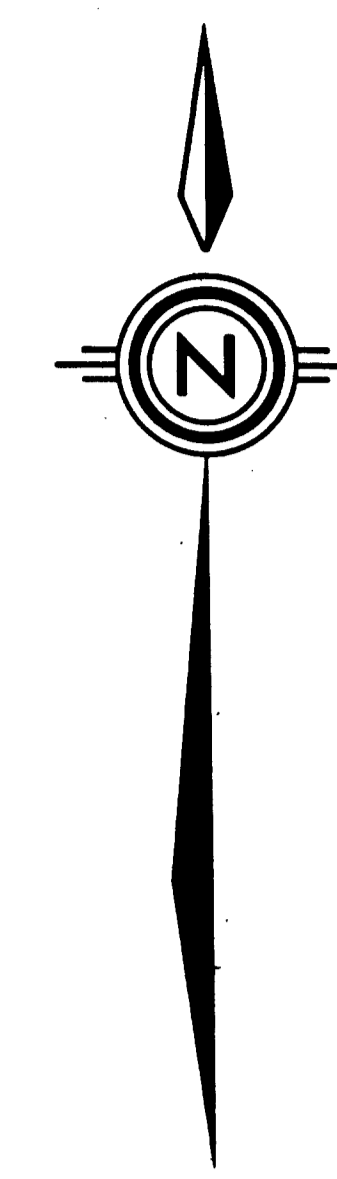
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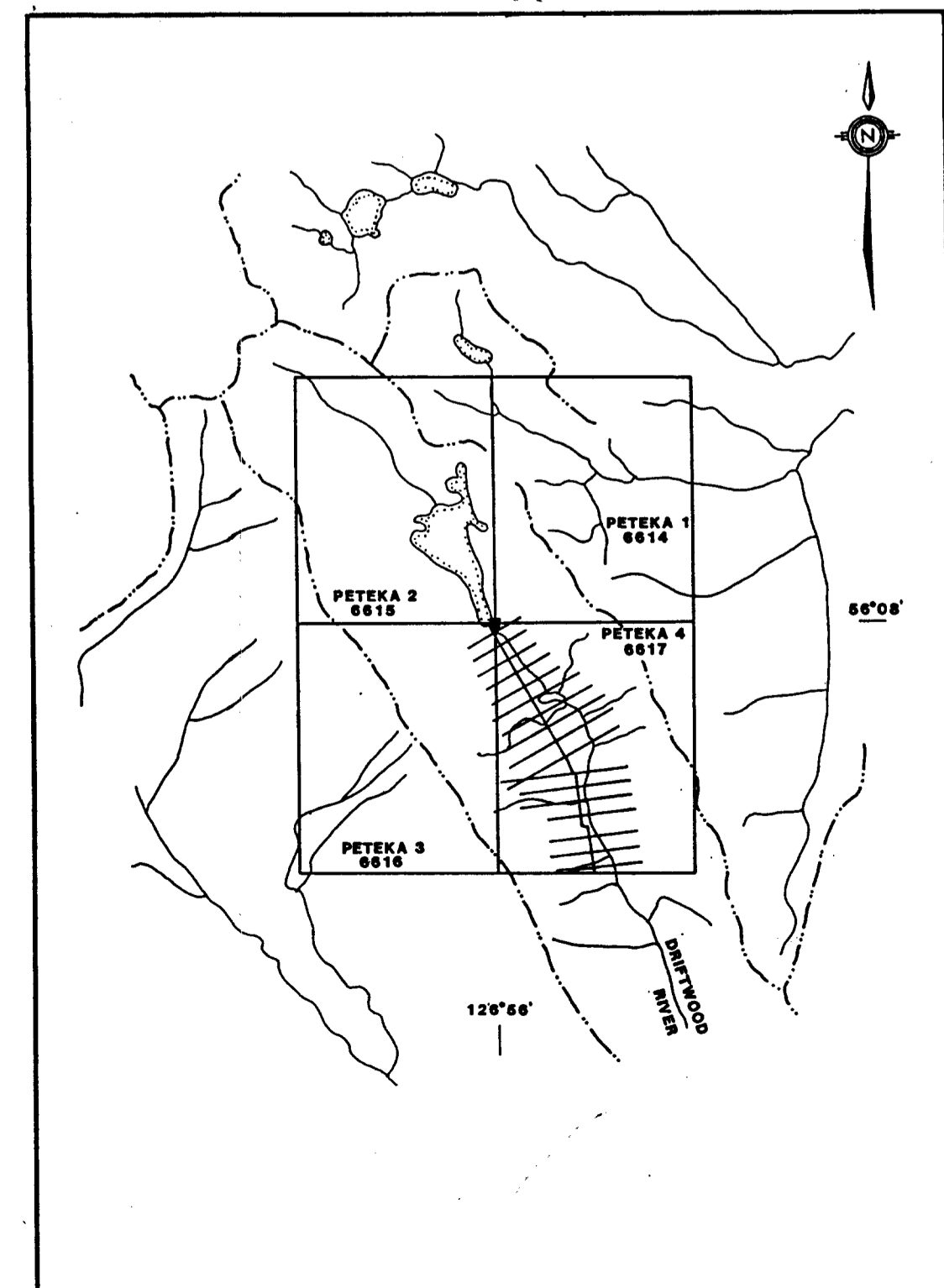
**Suncor** Inc. Resources Group COAL AND MINERALS  
DEPARTMENT

**BEAR LAKE PROJECT**  
PETEKA CLAIMS 3 & 4  
ROCK SAMPLE LOCATIONS

DATE AUGUST 1985	SCALE 1:5000	N.T.S. 94D/2E	DRAWING No. PT 002
---------------------	-----------------	------------------	-----------------------



**KEY MAP**



x  
16000.2 10,800  
0.180 oz/ton Au  
0.55 oz/ton Ag

x  
3425.484.200  
0.072 oz/ton Au  
15.44 oz/ton Ag

x  
-9000.2.3.100  
0.174 oz/ton Au  
4.40% Cu

x  
240.3.2.100  
11.84% Cu

x  
8512.0.100  
3.00% Cu

x  
274.1.9.100  
2.78% Cu

x  
77.12.1.200  
1.80% Cu

x  
222.24.0.100  
2.90% Cu

x  
14.1.2-100  
2.10% Cu

x  
14.6.4.200  
4.34% Cu

x  
19.6.6.100  
4.15% Cu

x  
48.0.5.100  
0.50% Cu

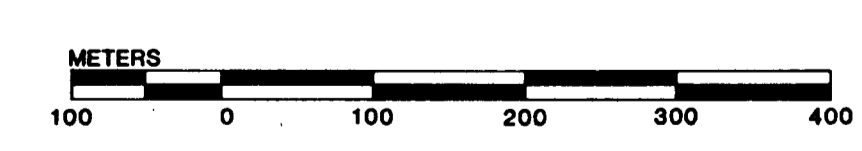
x  
185.1.4.200  
3.00% Cu

**LEGEND**  
ASSAY AND ANALYTICAL RESULTS

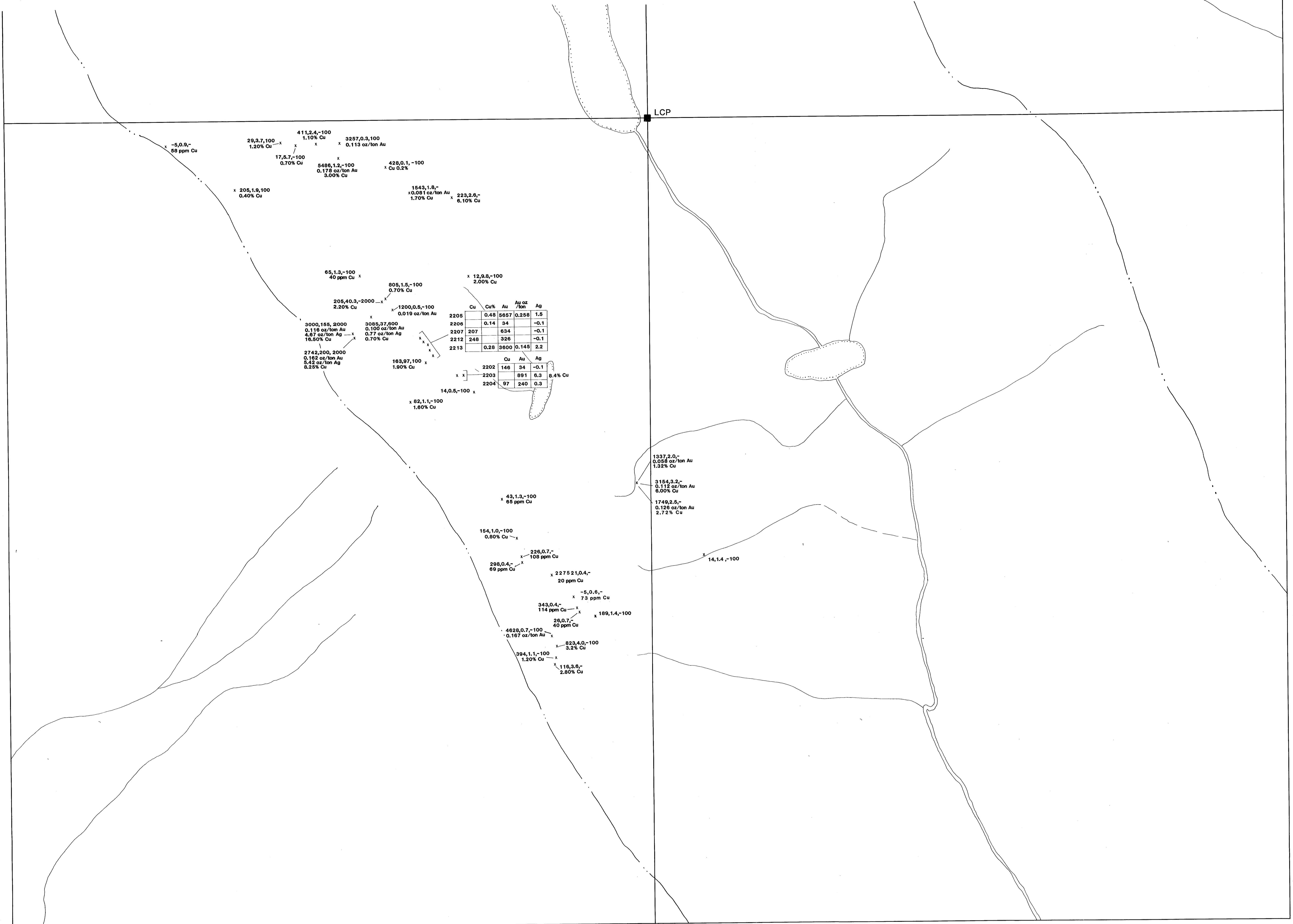
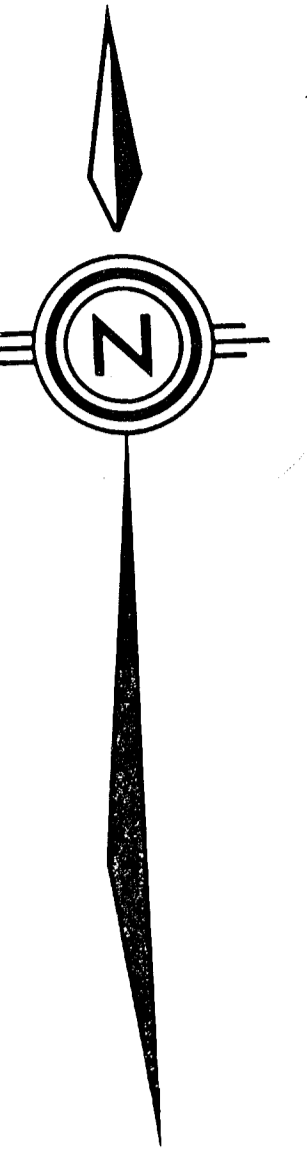
- x Rock sample locations
- x Au(ppb) Ag(ppm) As(ppm)
- Au oz/ton
- Ag oz/ton
- Cu%

**GEOLOGICAL BRANCH**  
**ASSESSMENT REPORT**

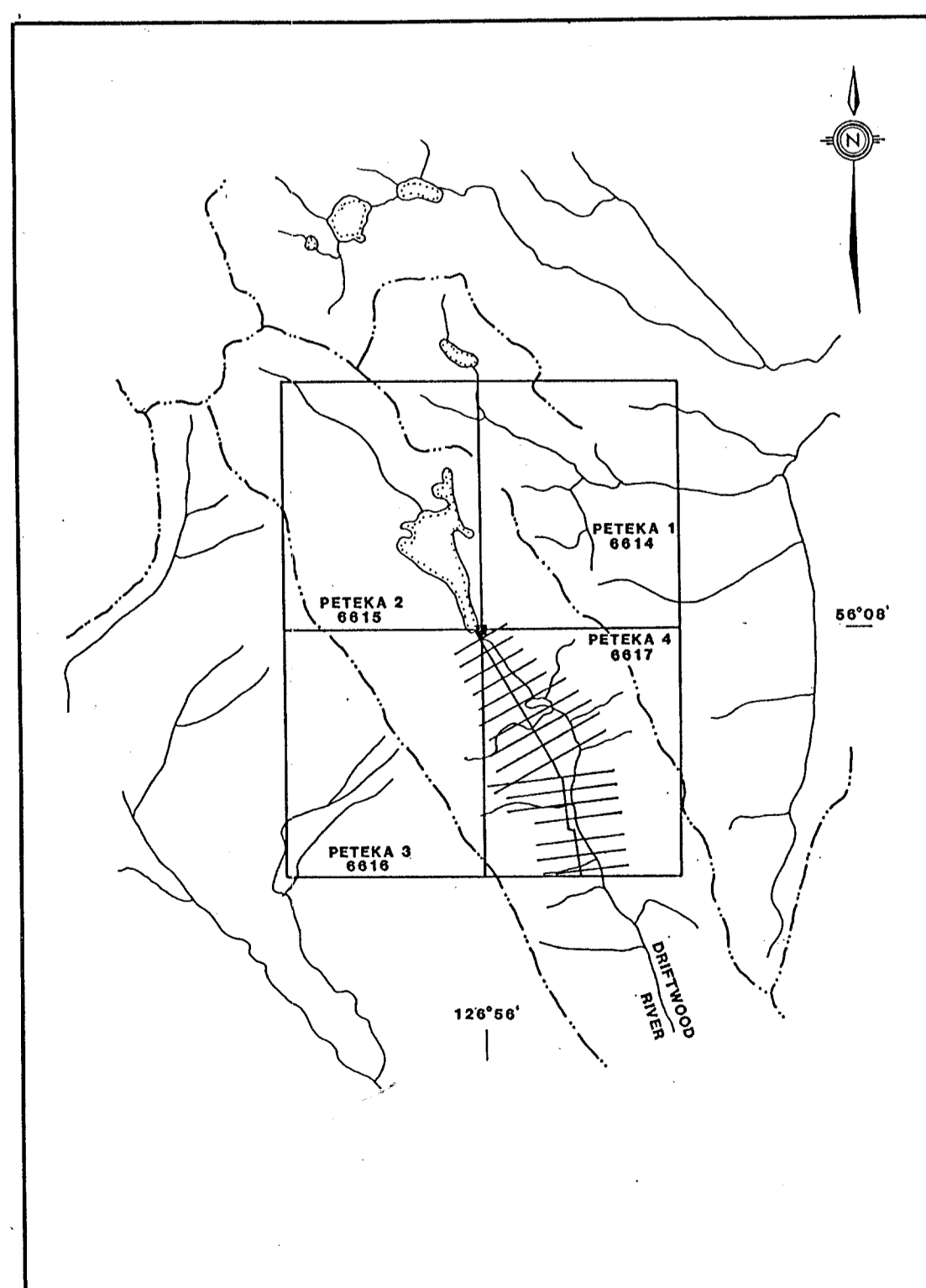
**14,424**



<b>Suncor</b> Inc Resources Group		COAL AND MINERALS DEPARTMENT	
<b>BEAR LAKE PROJECT</b>			
PETEKA CLAIMS 1 & 2			
ASSAY AND ANALYTICAL RESULTS			
DATE AUGUST 1985	SCALE 1:5000	N.T.S. 94D/2E	DRAWING No. PT 003



KEY MAP



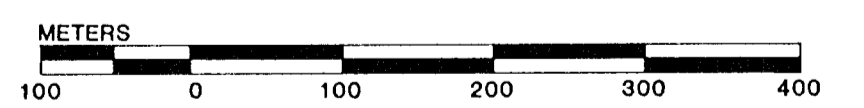
GEOLOGICAL BRANCH  
ASSESSMENT REPORT

14,424

LEGEND

ASSAY AND ANALYTICAL RESULTS

- x Rock sample locations
- x Au(ppb) Ag(ppm) As(ppm)  
Au oz/ton  
Ag oz/ton  
Cu %



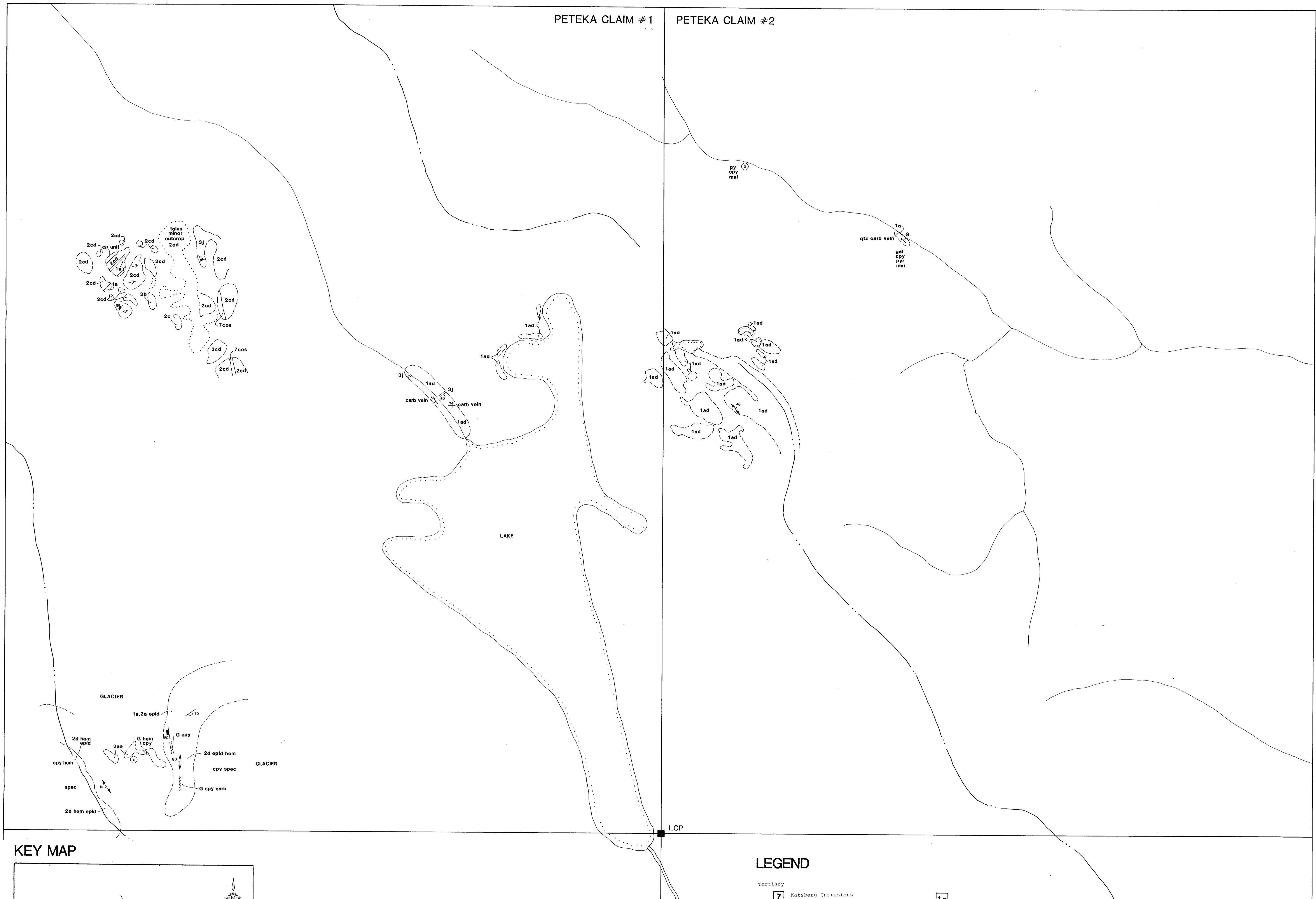
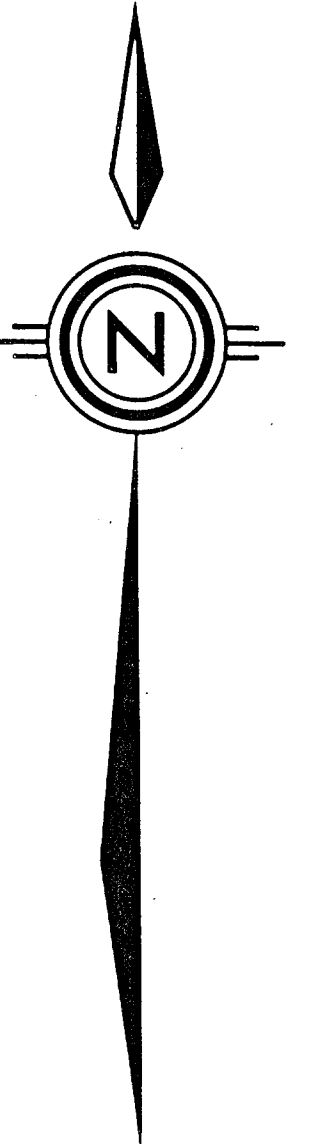
**Suncor** inc. Resources Group COAL AND MINERALS DEPARTMENT

BEAR LAKE PROJECT  
PETEKA CLAIMS 3 & 4  
ASSAY AND ANALYTICAL RESULTS

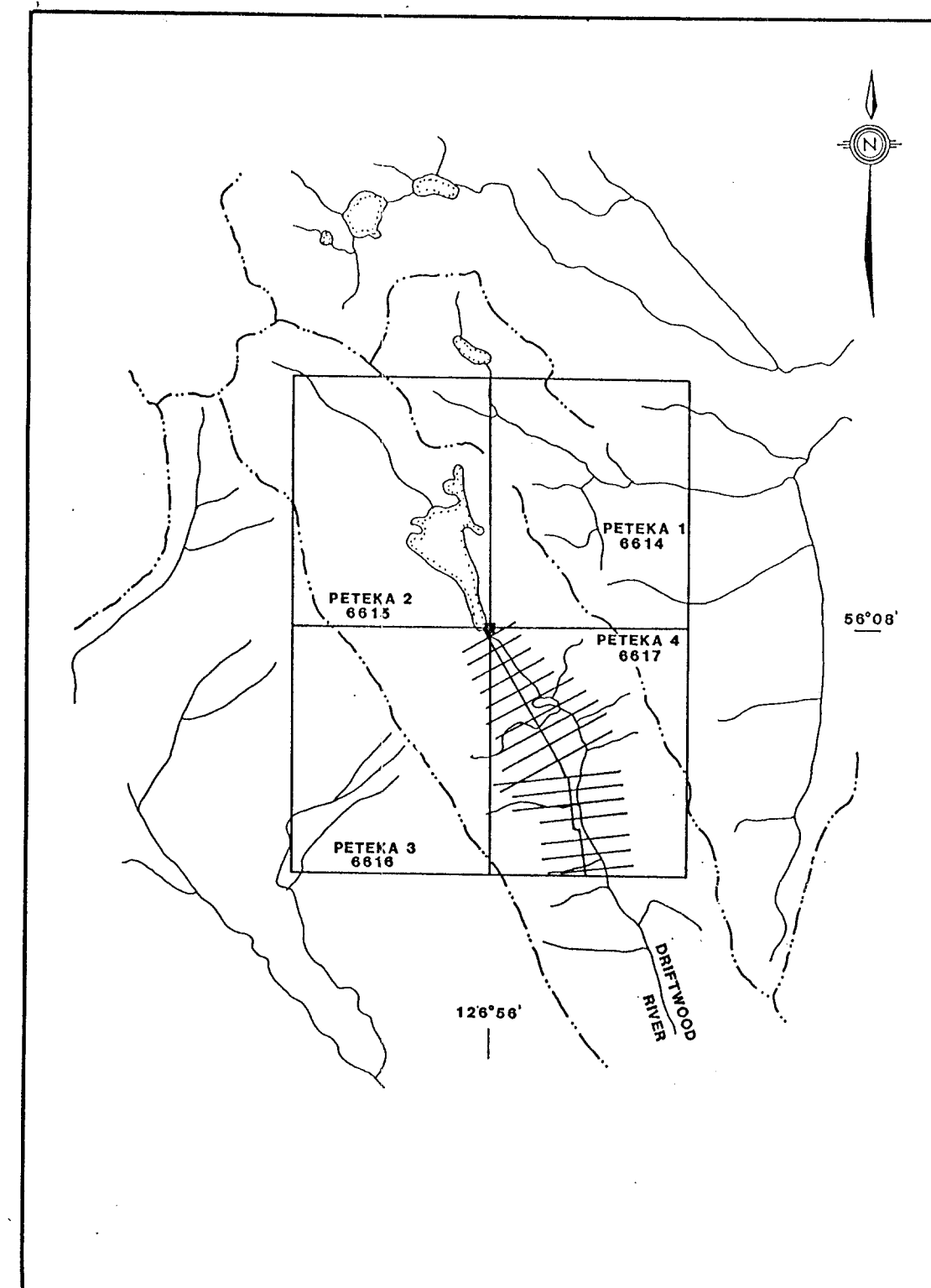
DATE AUGUST 1985	SCALE 1:5000	N.T.S. 94D/2E	DRAWING No. PT 004
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PETEKKA CLAIM #1

PETEKKA CLAIM #2



KEY MAP



SYMBOLS

- Geological boundary (defined, assumed)
- Bedding (vertical, inclined)
- Jointing (vertical, inclined)
- Shearing (vertical, inclined)
- Veins
- Gossan (point, area)
- X Small outcrop
- Outcrop area
- X Float
- carb carbonatization
- sil silicification
- chl chlorite
- ser sericitization
- epid epidote
- hem hematization
- py pyrite
- po pyrrhotite
- cpy chalcopyrite
- as arsenic
- gal galena
- hem hematite
- mt magnetite
- mal malachite

LEGEND

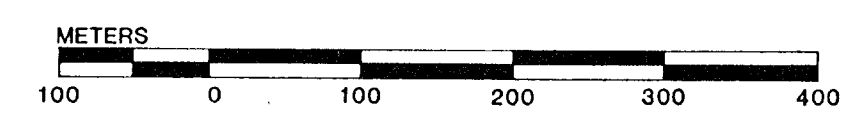
- Tertiary
  - 7 Katsberg Intrusions
    - Felsic Intrusions
      - b) Quartz diorite
      - c) diorite
      - e) granite
      - m) medium grained
      - n) coarse grained
      - o) fine grained
      - r) quartz phenocrysts
      - s) plagioclase phenocrysts
- Lower to Lower Middle Jurassic
  - 3 Hazelton Group
    - Clastic - metasediments
      - a) argillite
      - b) greywacke
      - j) interflow sediments
- 2 Felsic to Intermediate Volcanics - undifferentiated
  - a) flow
  - b) tuff
  - c) lapilli tuff
  - d) breccia - agglomerate
  - e) feldspar porphyry
  - f) hornblende porphyry
  - g) feldspar - hornblende porphyry
  - h) amygdule
  - j) andesite
  - k) dacite

1a Fine to medium grained andesite ranging in color from grey-green to purple. Locally up to 5-10% plagioclase phenocrysts

1ad Plagioclase is locally weathered to clay minerals. Abundant epidote alteration present in stringers 1-10 mm. wide and mafic minerals also commonly epidotized.

GEOLOGICAL BRANCH ASSESSMENT REPORT

14,424



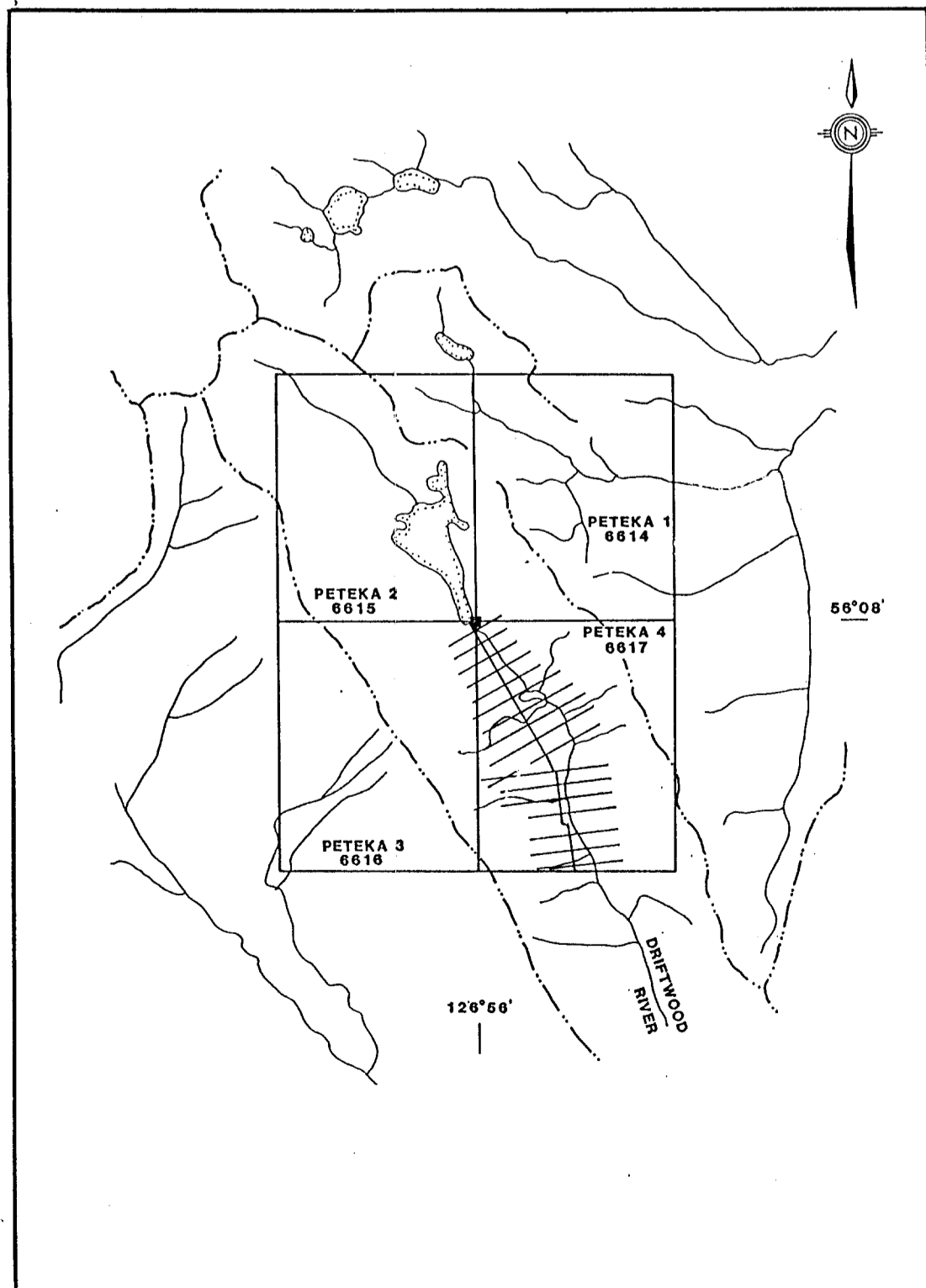
**Suncor** Inc. Resources Group COAL AND MINERALS DEPARTMENT

**BEAR LAKE PROJECT**  
PETEKKA CLAIMS 1 & 2  
GEOLOGY

DATE AUGUST 1985	SCALE 1:5000	N.T.S. 94D/2E	DRAWING No. PT 005
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KEY MAP



SYMBOLS

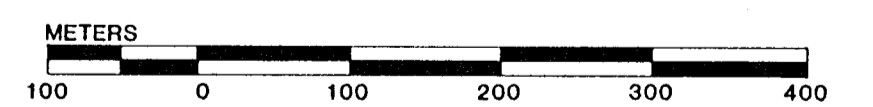
- Geological boundary (defined, assumed)
- Bedding (vertical, inclined)
- Jointing (vertical, inclined)
- Shearing (vertical, inclined)
- Veins
- Outcrop (point, area)
- X Small outcrop
- Outcrop area
- Float
- carb carbonatization
- sil silicification
- chl chlorite
- ser sericitization
- epid epidote
- hem hematization
- py pyrite
- po pyrrhotite
- cpy chalcopyrite
- as arsenic
- gal galena
- hem hematite
- mt magnetite
- mal malachite

LEGEND

- Tertiary
    - 7 Katsberg Intrusions
    - Pelvic Intrusions
      - b) Quartz diorite
      - c) diorite
      - e) granite
      - m) medium grained
      - n) coarse grained
      - o) fine grained
      - r) quartz phenocrysts
      - a) plagioclase phenocrysts
  - Lower to Lower Middle Jurassic
    - Hazelton Group
      - 3 Clastic - metasediments
        - a) argillite
        - b) greywacke
        - j) interflow sediments
      - 2 Pelvic to Intermediate Volcanics - undifferentiated
        - a) flow
        - b) tuff
        - c) lapilli tuff
        - d) breccia - agglomerate
        - e) feldspar porphyry
        - f) hornblende porphyry
        - g) feldspar - hornblende porphyry
        - h) amygdale
        - j) andesite
        - k) dacite
- 1a Fine to medium grained andesite ranging in color from grey-green to purple. Locally up to 5-10% plagioclase phenocrysts
- 1ad Plagioclase is locally weathered to clay minerals. Abundant epidote alteration present in stringers 1-10 mm. wide and mafic minerals also commonly epidotized.

GEOLOGICAL BRANCH ASSESSMENT REPORT

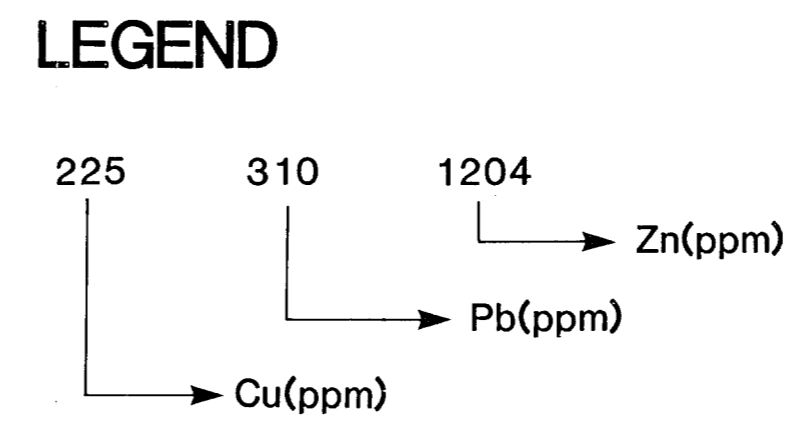
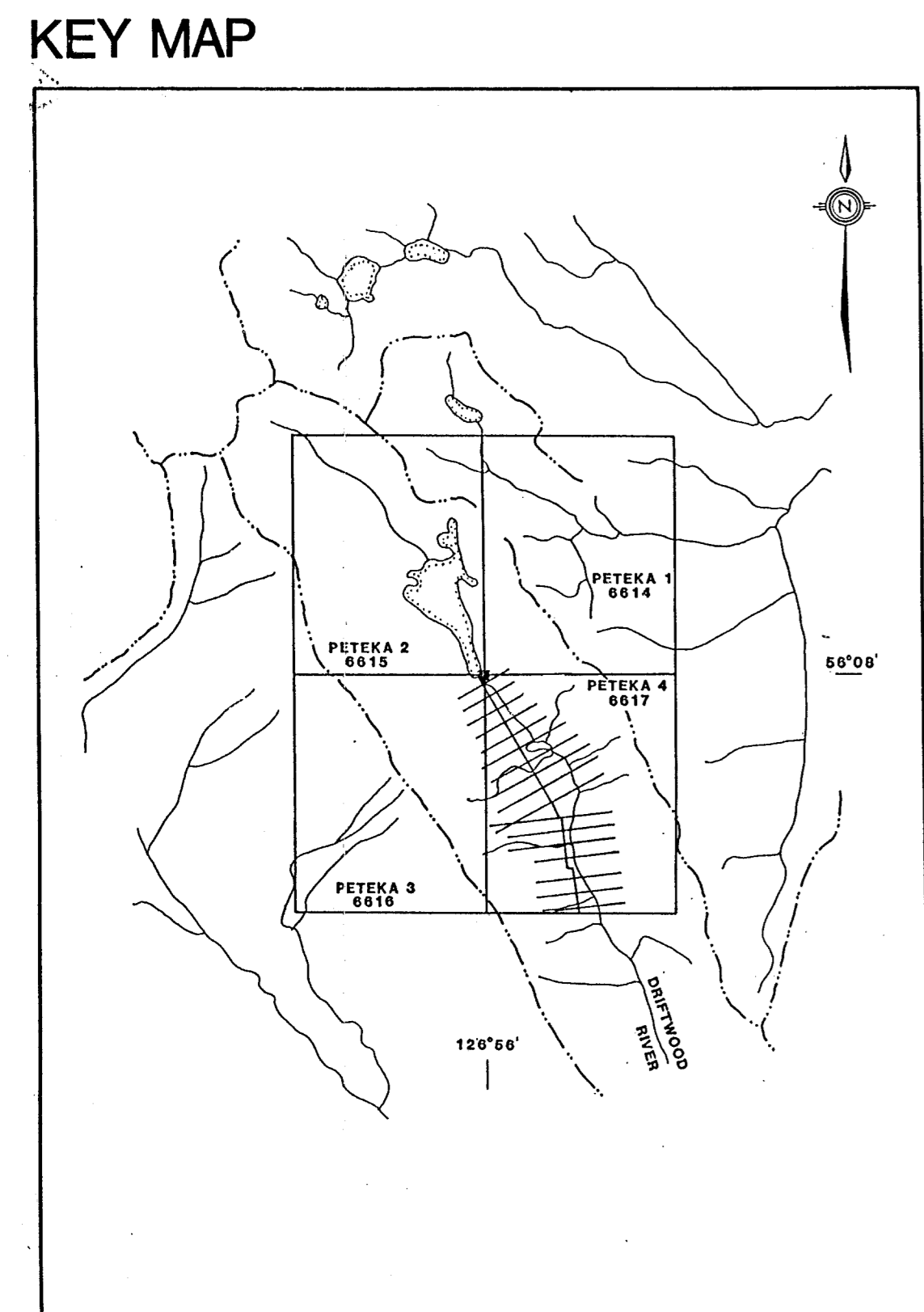
14,424



Suncor Inc. Resources Group COAL AND MINERALS DEPARTMENT

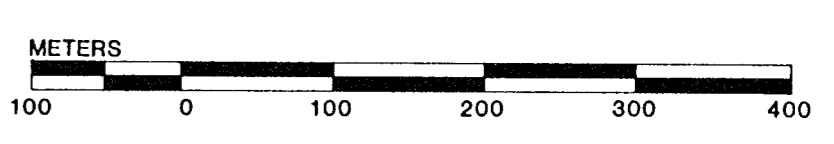
BEAR LAKE PROJECT  
PETEKA CLAIMS 3 & 4  
GEOLOGY

DATE AUGUST 1985	SCALE 1:5000	N.T.S. 94D/2E	DRAWING No. PT 006
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GEOLOGICAL BRANCH  
ASSESSMENT REPORT

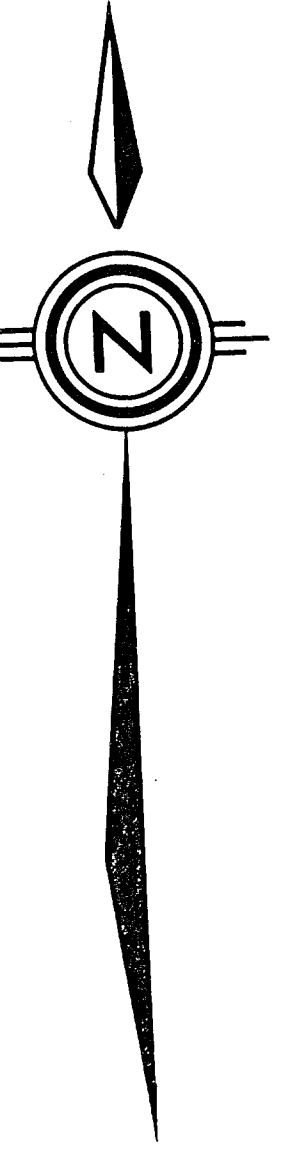
**14,424**



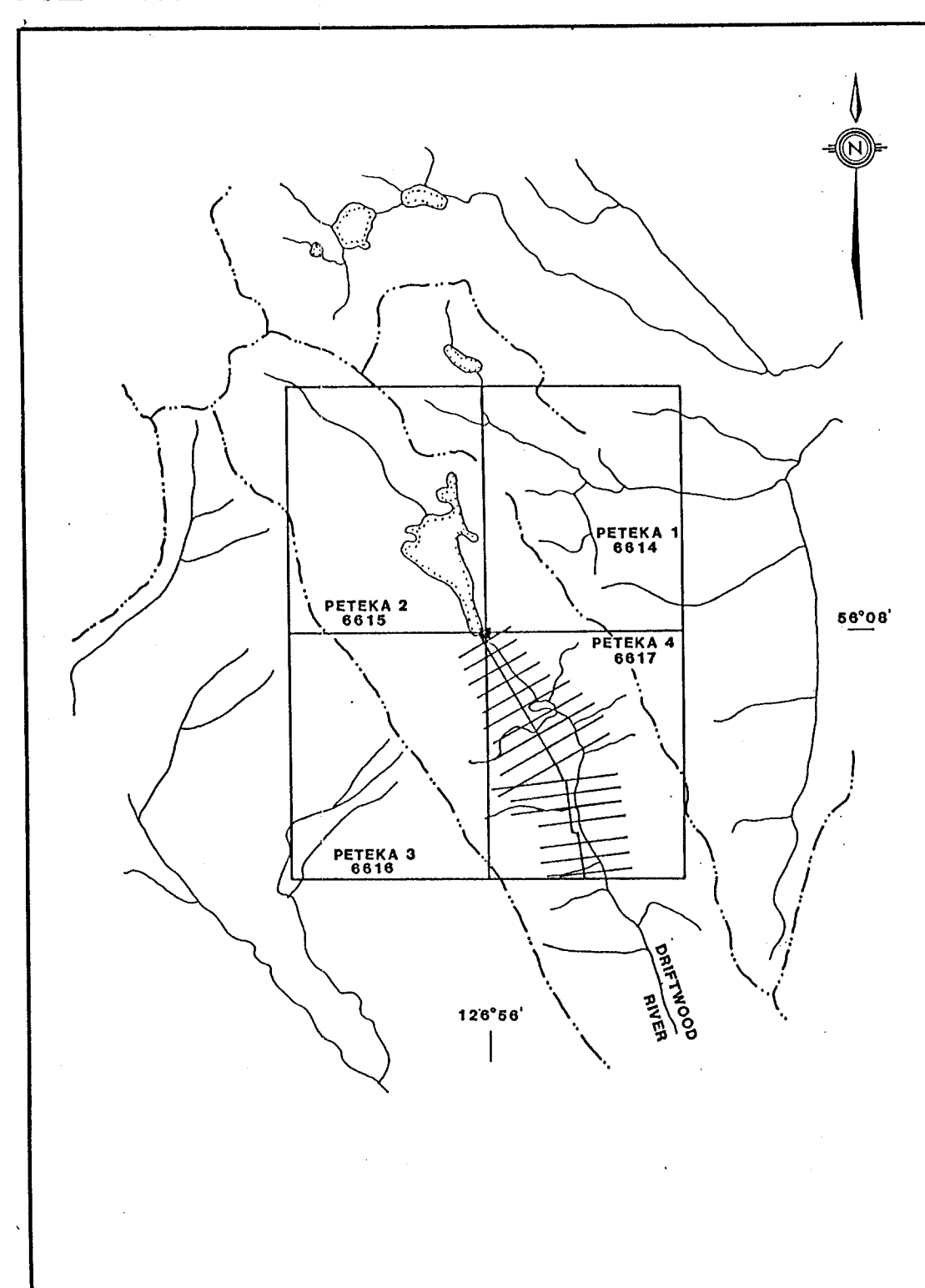
<b>Suncor</b> Inc. Resources Group		COAL AND MINERALS DEPARTMENT	
<b>BEAR LAKE PROJECT</b>			
PETEKA CLAIMS 3 & 4			
GEOCHEMICAL RESULTS Cu,Pb,Zn			
DATE AUGUST 1985	SCALE 1:5000	N.T.S. 94D/2E	DRAWING No. PT 007

PETKA#3

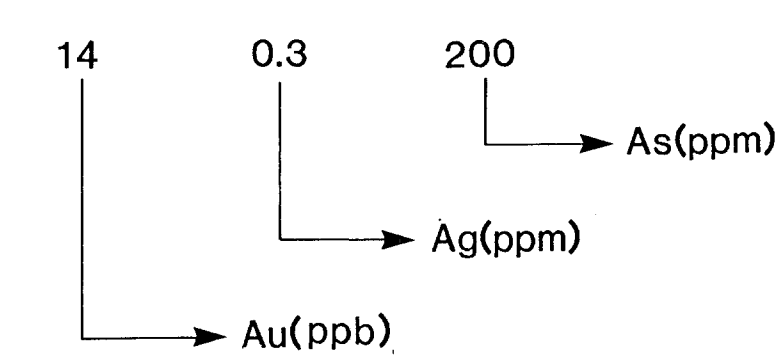
PETKA#4



KEY MAP



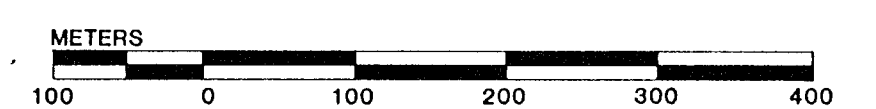
LEGEND



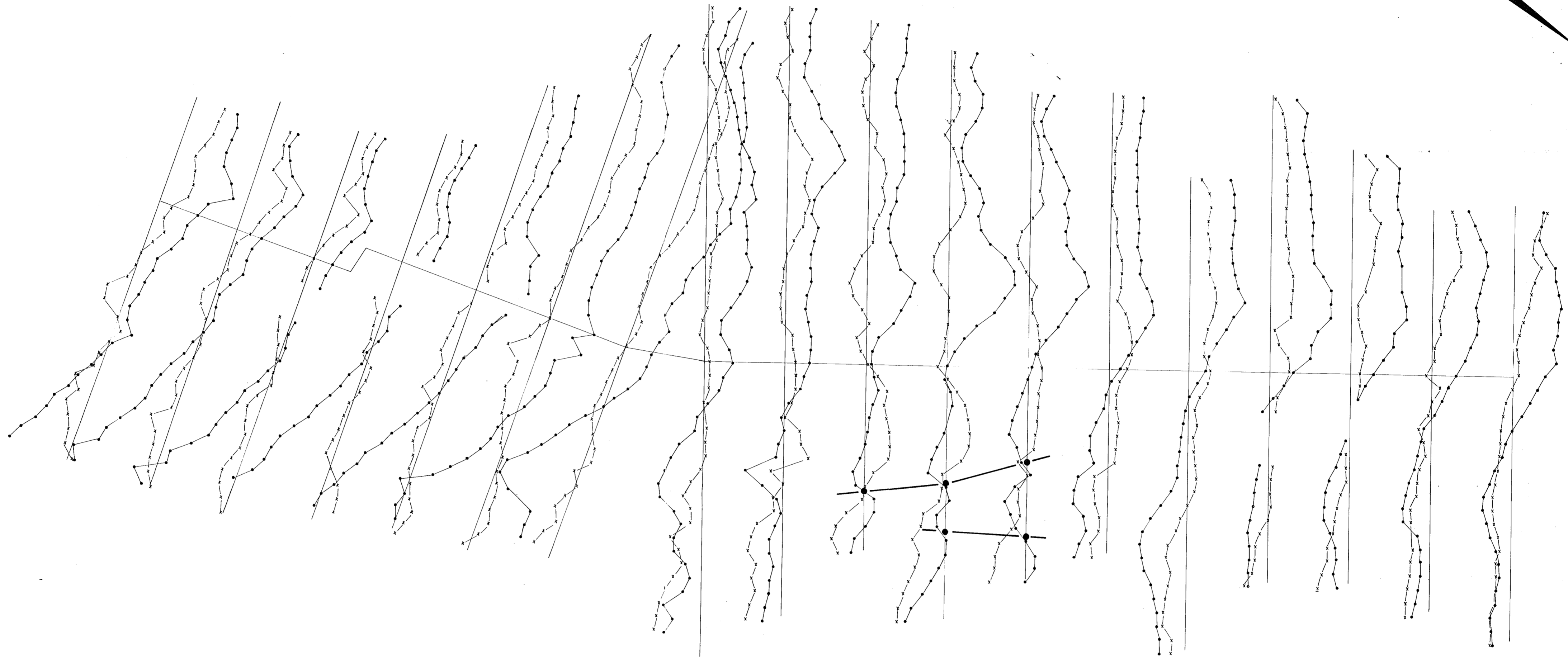
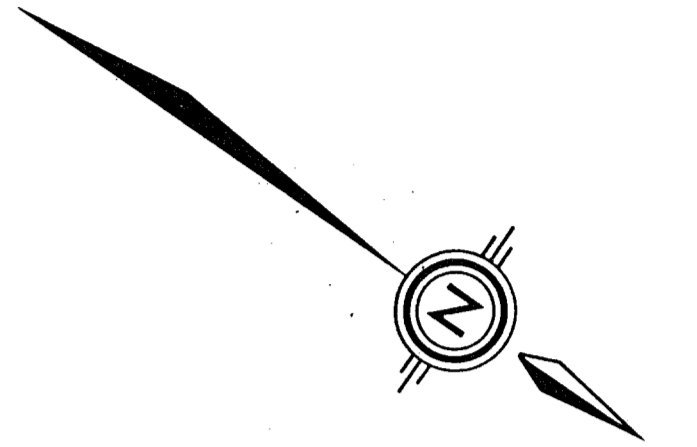
Note: "-" sign indicates less than.  
All As values  $\leq$  100ppm As except where noted.

GEOLOGICAL BRANCH  
ASSESSMENT REPORT

14,424

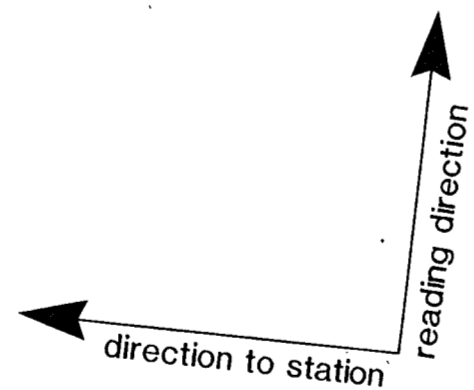
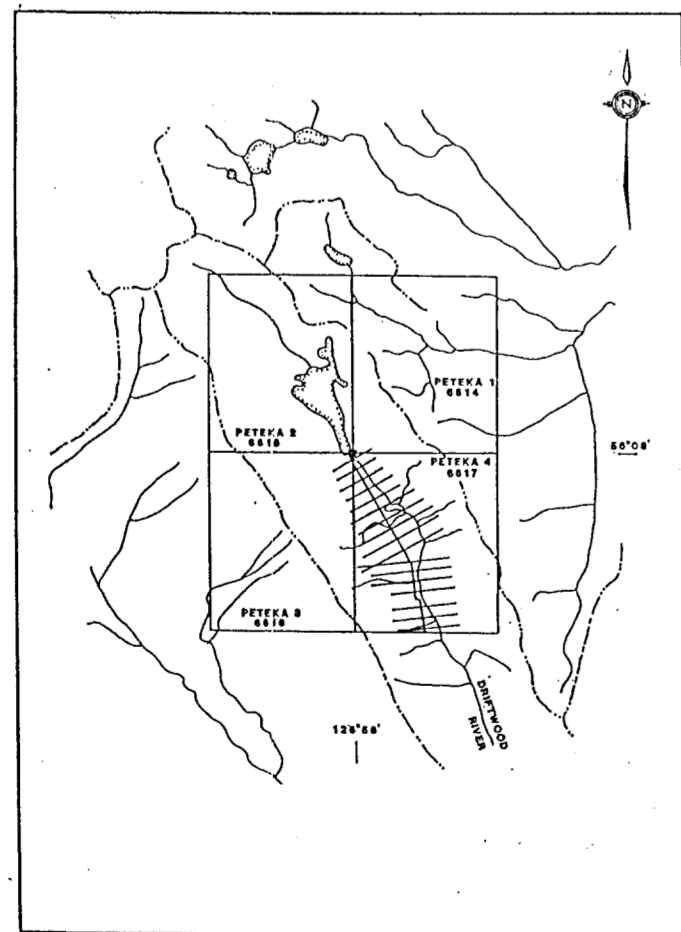


<b>Suncor</b> Inc. Resources Group		COAL AND MINERALS DEPARTMENT	
<b>BEAR LAKE PROJECT</b>			
PETEKA CLAIMS 3 & 4			
GEOCHEMICAL RESULTS Au,Ag,As			
DATE AUGUST 1985	SCALE 1:5000	N.T.S. 94D/2E	DRAWING No. PT 008



L 25+50S L 24+00S L 22+50S L 21+00S L 19+50S L 18+00S L 16+50S L 15+00S L 13+50S L 12+00S L 10+50S L 9+00S L 7+50S L 6+00S L 4+50S L 3+00S L 1+50S L 0+00

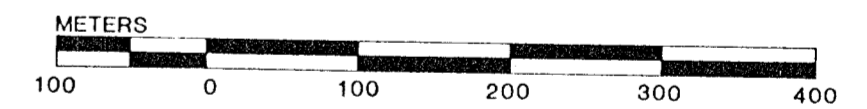
**KEY MAP**



**LEGEND**

- INPHASE
- x—x QUADRATURE
- INTERPRETED CONDUCTOR AXIS
- //// INTERPRETED CONDUCTOR WIDTH

TRANSMITTER STATION: NLK Seattle, Washington - 24.8 kHz  
INSTRUMENT: Geonics VLF EM-16  
Direction to station : 155  
Reading direction : 245  
Operator : I. Simpson

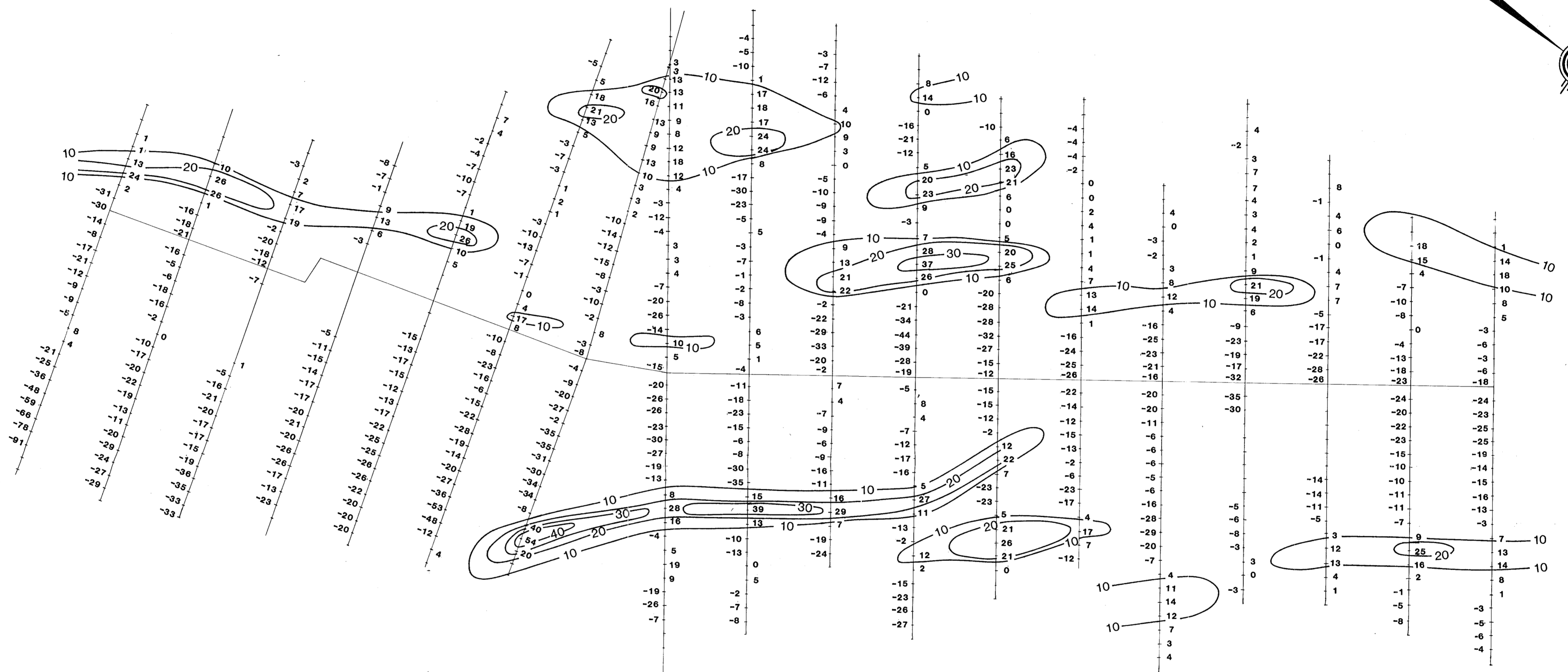


<b>Suncor</b> Int. Resources Group		COAL AND MINERALS DEPARTMENT	
<b>BEAR LAKE PROJECT</b>			
PETEKA CLAIMS			
VLF SURVEY			
DATE	SCALE	N.T.S.	DRAWING No
DEC 85	1:5000	94D/2W	PT 009

**GEOLOGICAL BRANCH ASSESSMENT REPORT**

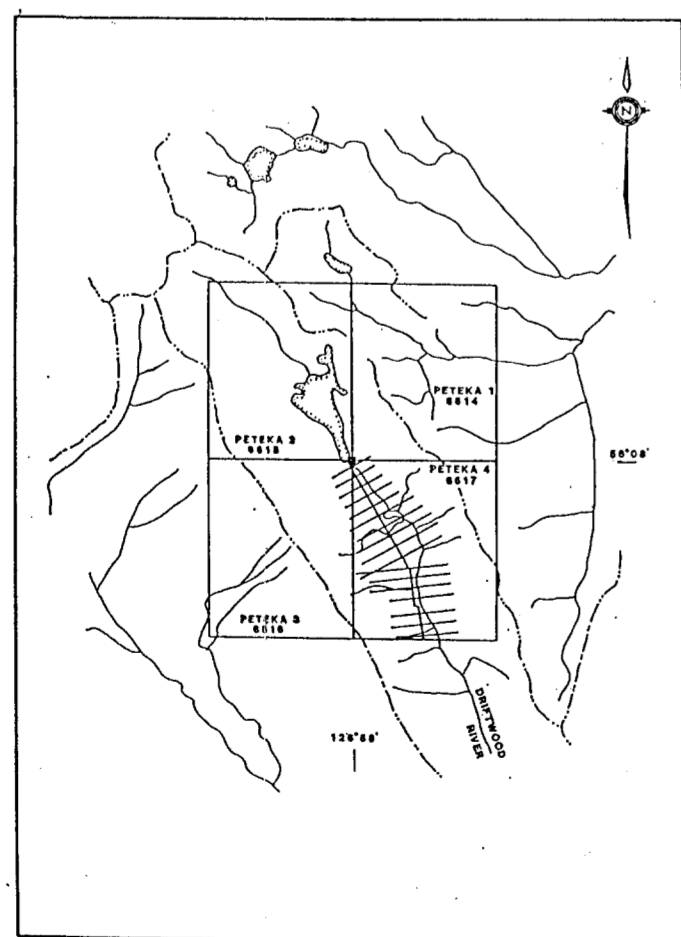
**14,424**





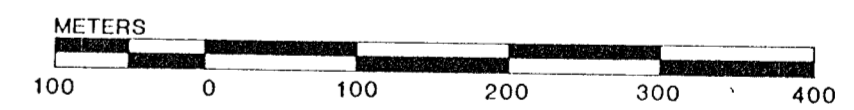
L 25+50S L 24+00S L 22+50S L 21+00S L 19+50S L 18+00S L 16+50S L 15+00S L 13+50S L 12+00S L 10+50S L 9+00S L 7+50S L 6+00S L 4+50S L 3+00S L 1+50S L 0+00

**KEY MAP**



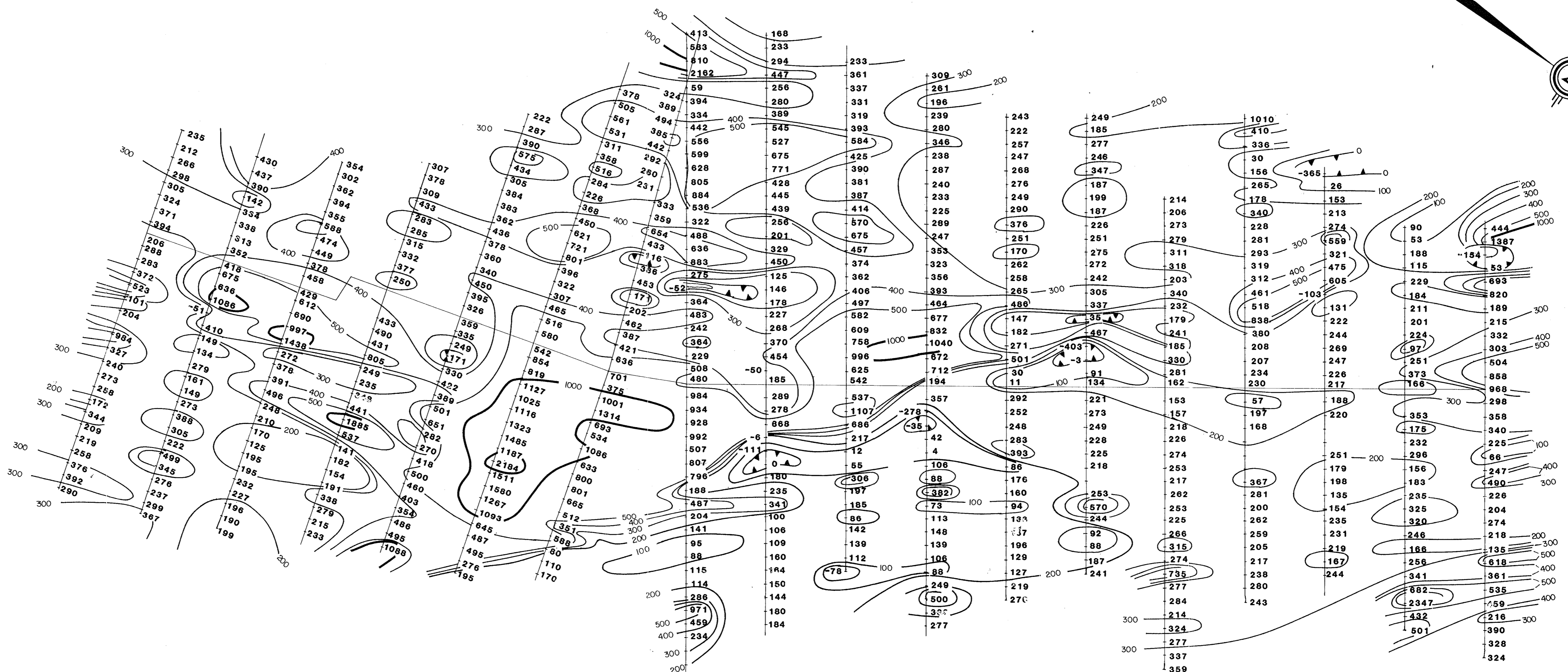
**LEGEND**

- 20 Negative Fraser Filter Value
- 7 Positive Fraser Filter Value
- 20— Contoured Value of Filter
- Contour Value 10 Per Cent



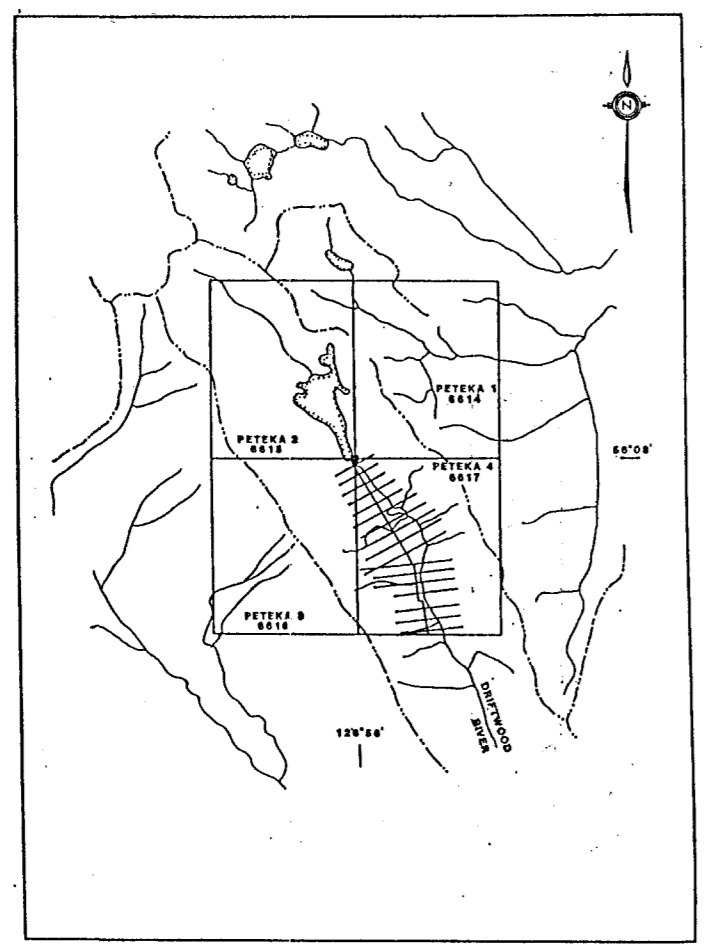
<b>Suncor</b> inc Resources Group		COAL AND MINERALS DEPARTMENT	
<b>BEAR LAKE PROJECT</b>			
PETEKA CLAIMS			
PETEKA FRASER FILTER			
VLF-EM 16 SURVEY			
DATE	SCALE	N.T.S.	DRAWING No.
DEC 85	1:5000	94D/2W	PT 010

14,424



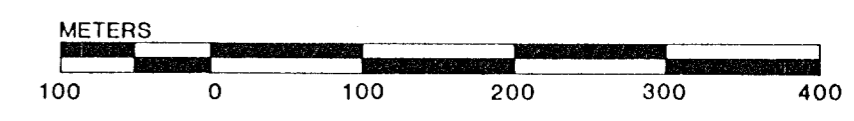
L 25+50S L 24+00S L 22+50S L 21+00S L 19+50S L 18+00S L 16+50S L 15+00S L 13+50S L 12+00S L 10+50S L 9+00S L 7+50S L 6+00S L 4+50S L 3+00S L 1+50S L 0+00

**KEY MAP**



**LEGEND**

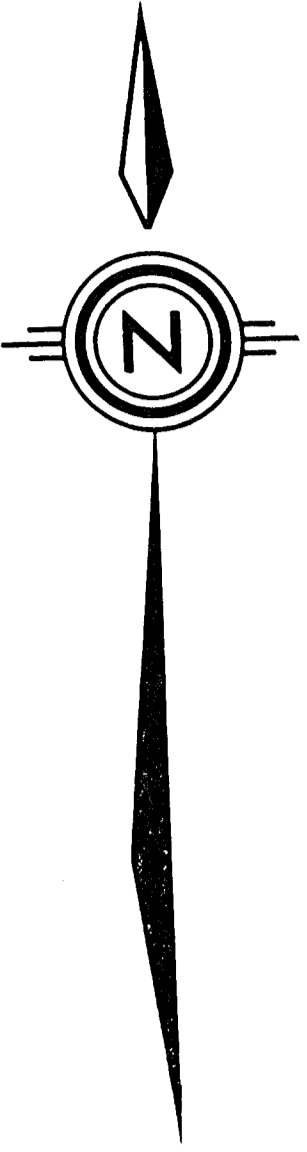
Operator : I. Simpson  
 Instrument : Scintrex MP-2  
 Base Value : 58,000 Gammas  
 Accuracy: ±2 Gammas  
 Contour Interval : 100 Gammas



Suncor Inc. Resources Group		COAL AND MINERALS DEPARTMENT	
<b>BEAR LAKE PROJECT</b> <b>PETEKA CLAIMS</b> <b>MAGNETOMETER SURVEY</b>			
DATE	SCALE	N.T.S.	DRAWING No.
27/08/85	1:5000	94D/2W	PT 011

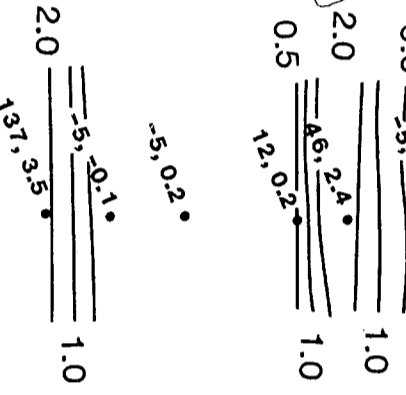
**GEOLOGICAL BRANCH ASSESSMENT REPORT**

14,424

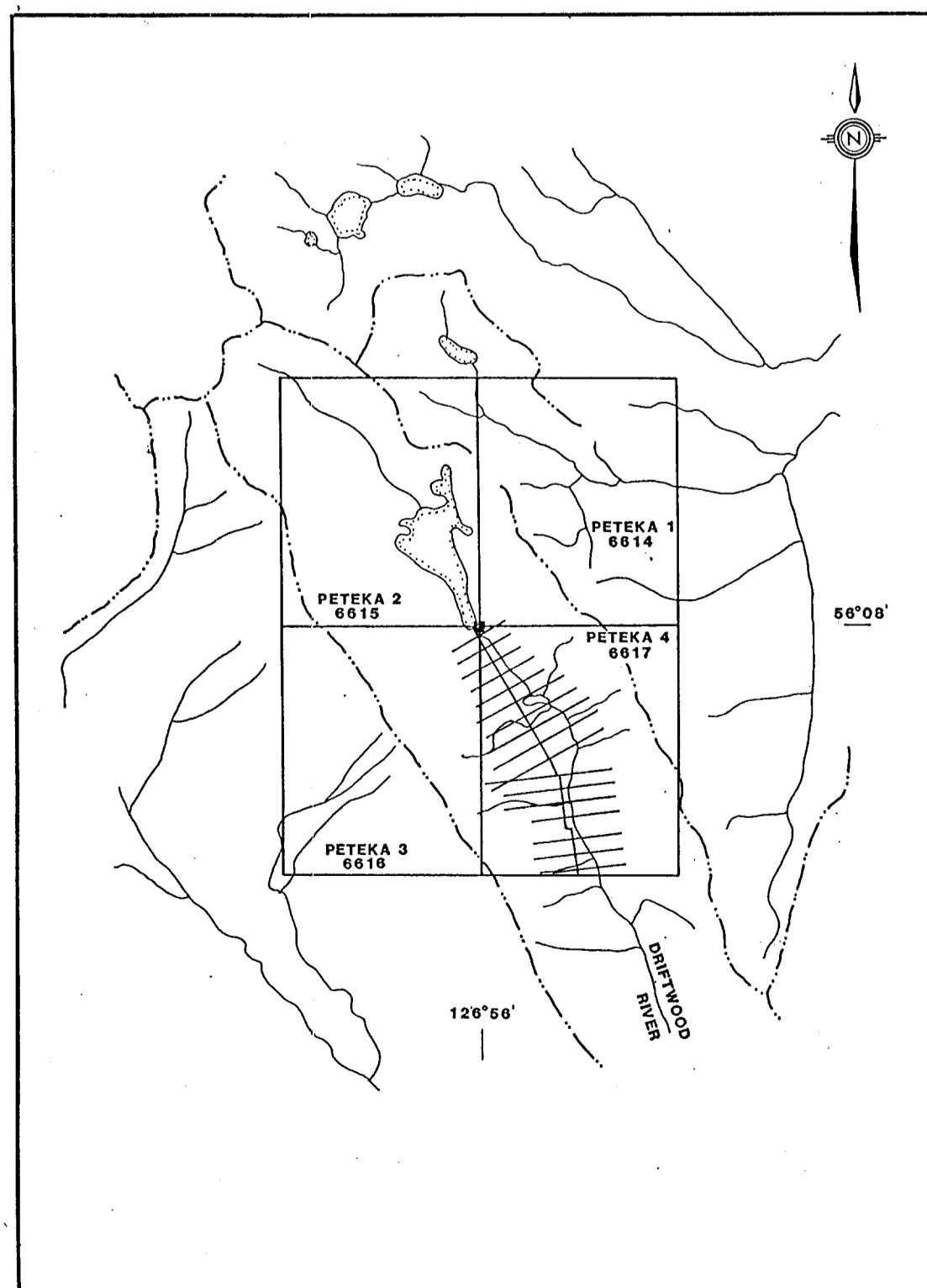


PETKA#3

PETKA#4



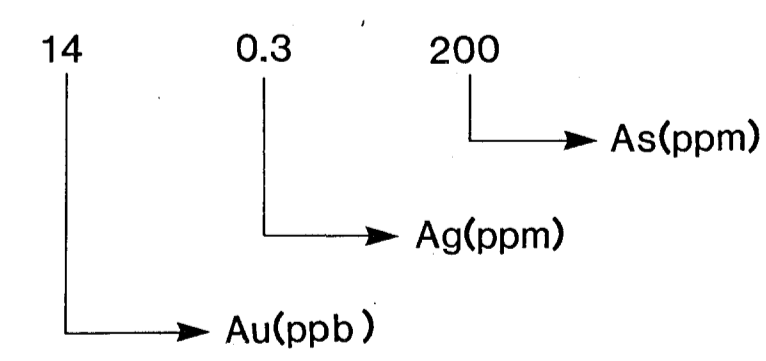
KEY MAP



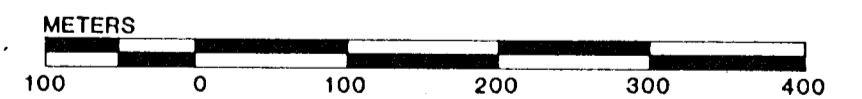
GEOLOGICAL BRANCH  
ASSESSMENT REPORT

14,424

LEGEND



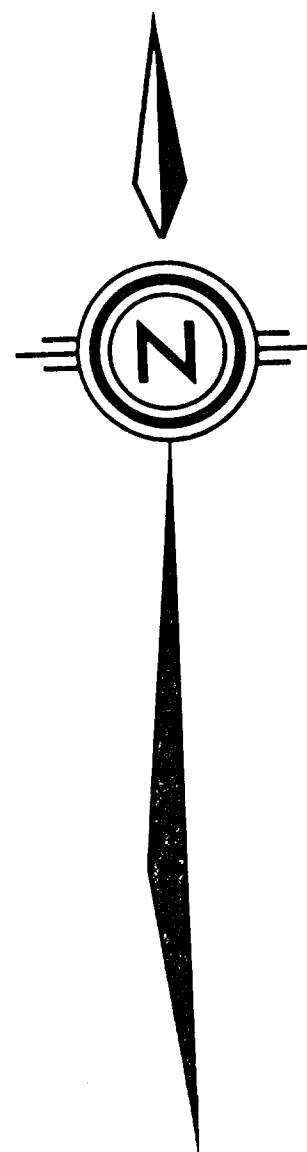
Note: "-" sign indicates less than.  
All As values  $\leq$  100ppm As except where noted.  
Silver contours in ppm



**Suncor** Inc. Resources Group COAL AND MINERALS DEPARTMENT

BEAR LAKE PROJECT  
PETKA CLAIMS 3 & 4  
GEOCHEMICAL RESULTS  
Au, Ag, As  
SILVER CONTOURS

DATE: AUGUST 1985 SCALE: 1:5000 N.T.S.: 94D/2E DRAWING No.: PT 013

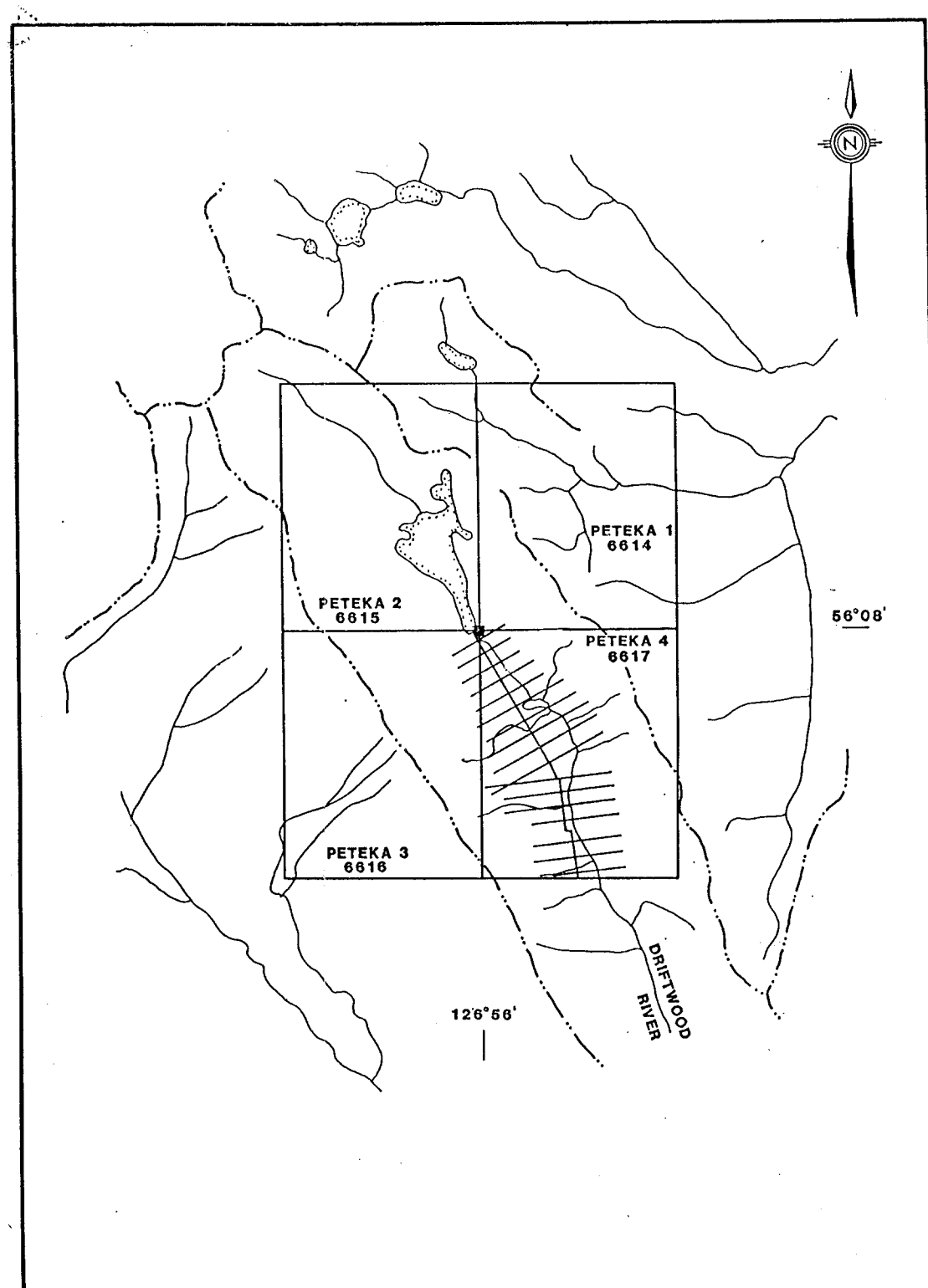


PETKA#3

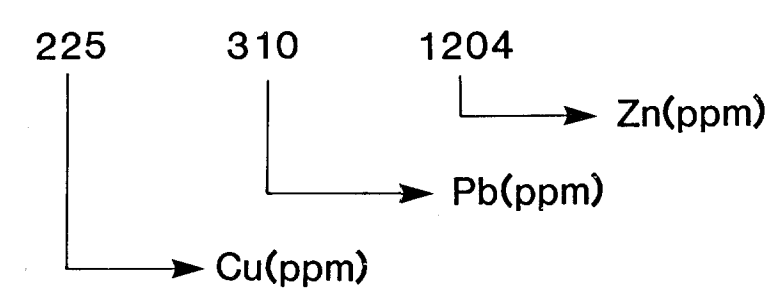
PETKA#4



KEY MAP

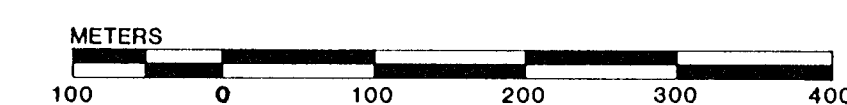


LEGEND



GEOLOGICAL BRANCH  
ASSESSMENT REPORT

14,424



**Suncor** Inc. Resources Group COAL AND MINERALS  
DEPARTMENT

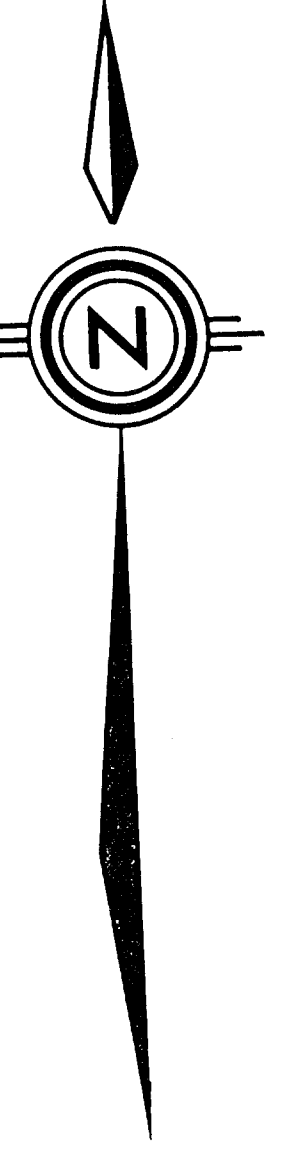
BEAR LAKE PROJECT

PETKA CLAIMS 3 & 4

GEOCHEMICAL RESULTS  
Cu,Pb,Zn

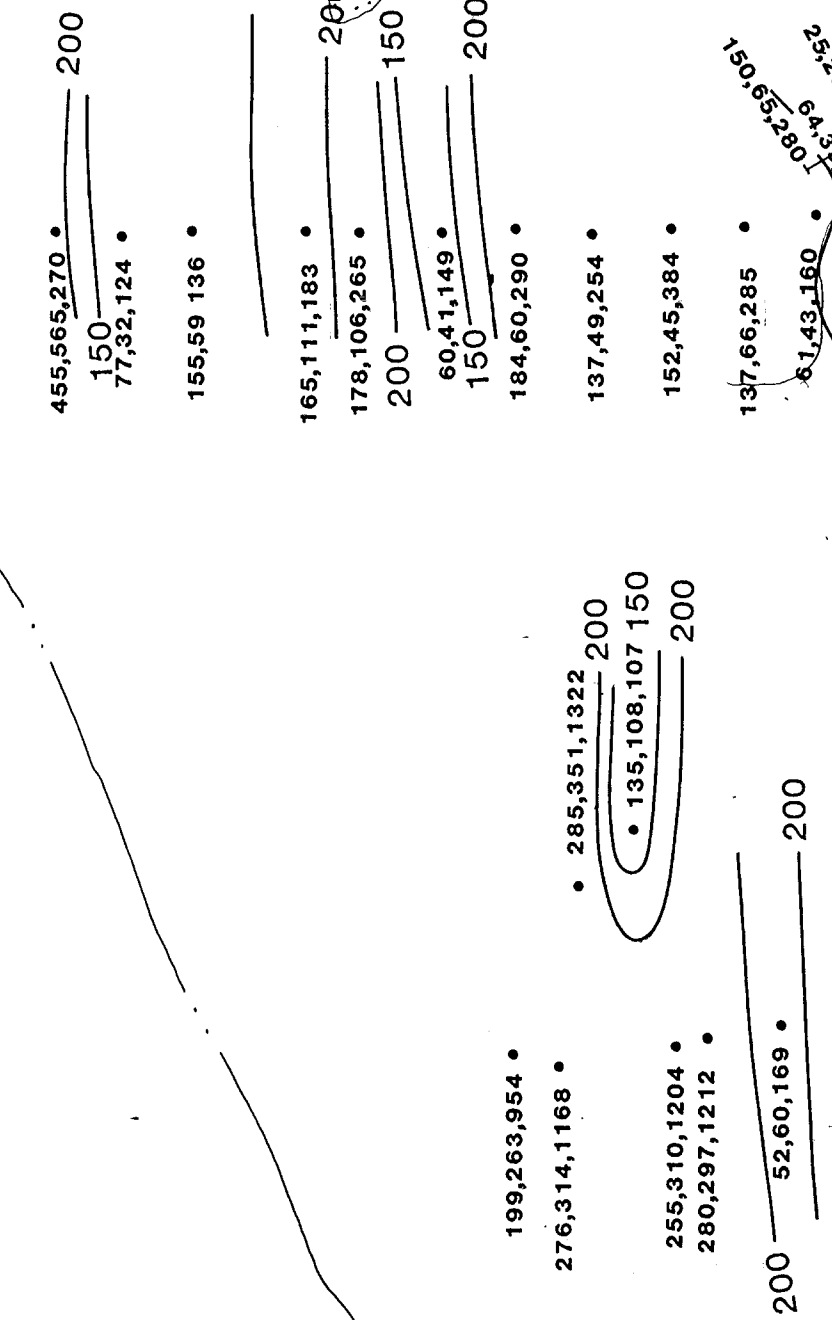
LEAD CONTOURS IN PPM

DATE AUGUST 1985	SCALE 1:5000	N.T.S. 94D/2E	DRAWING No. PT 015
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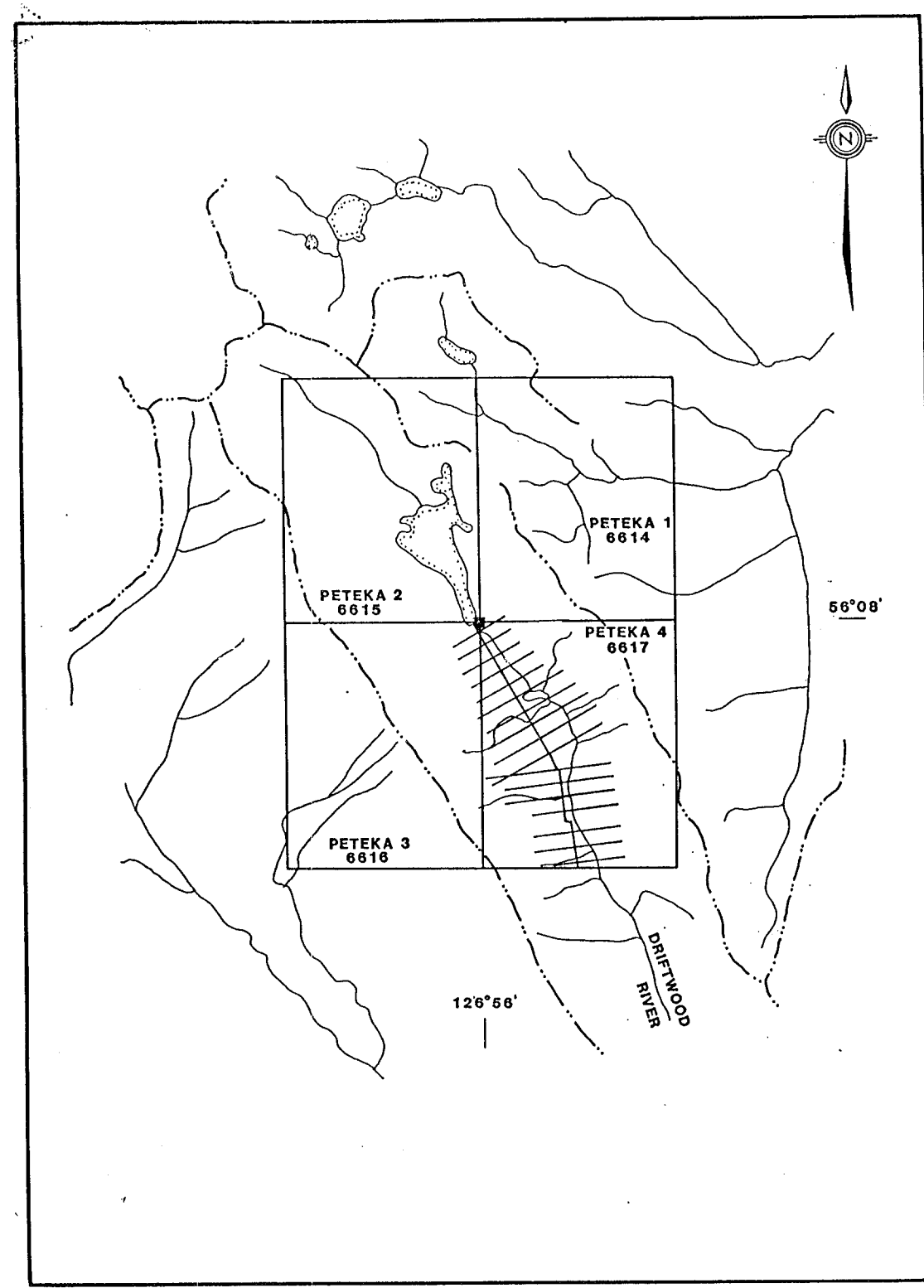


PETKA#3

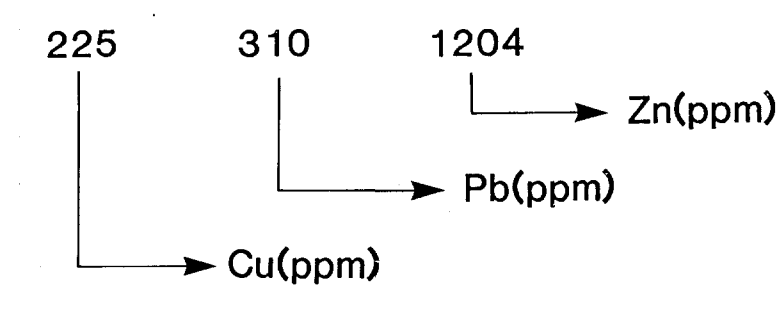
PETKA#4



KEY MAP

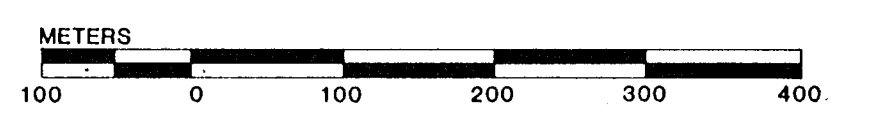


LEGEND



GEOLOGICAL BRANCH ASSESSMENT REPORT

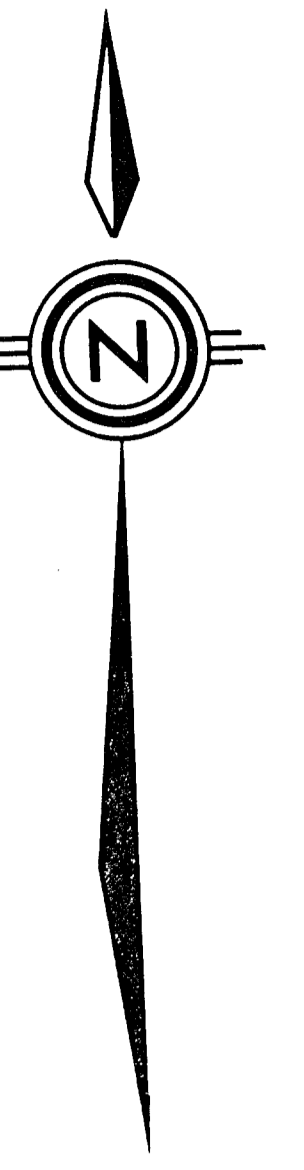
14,424



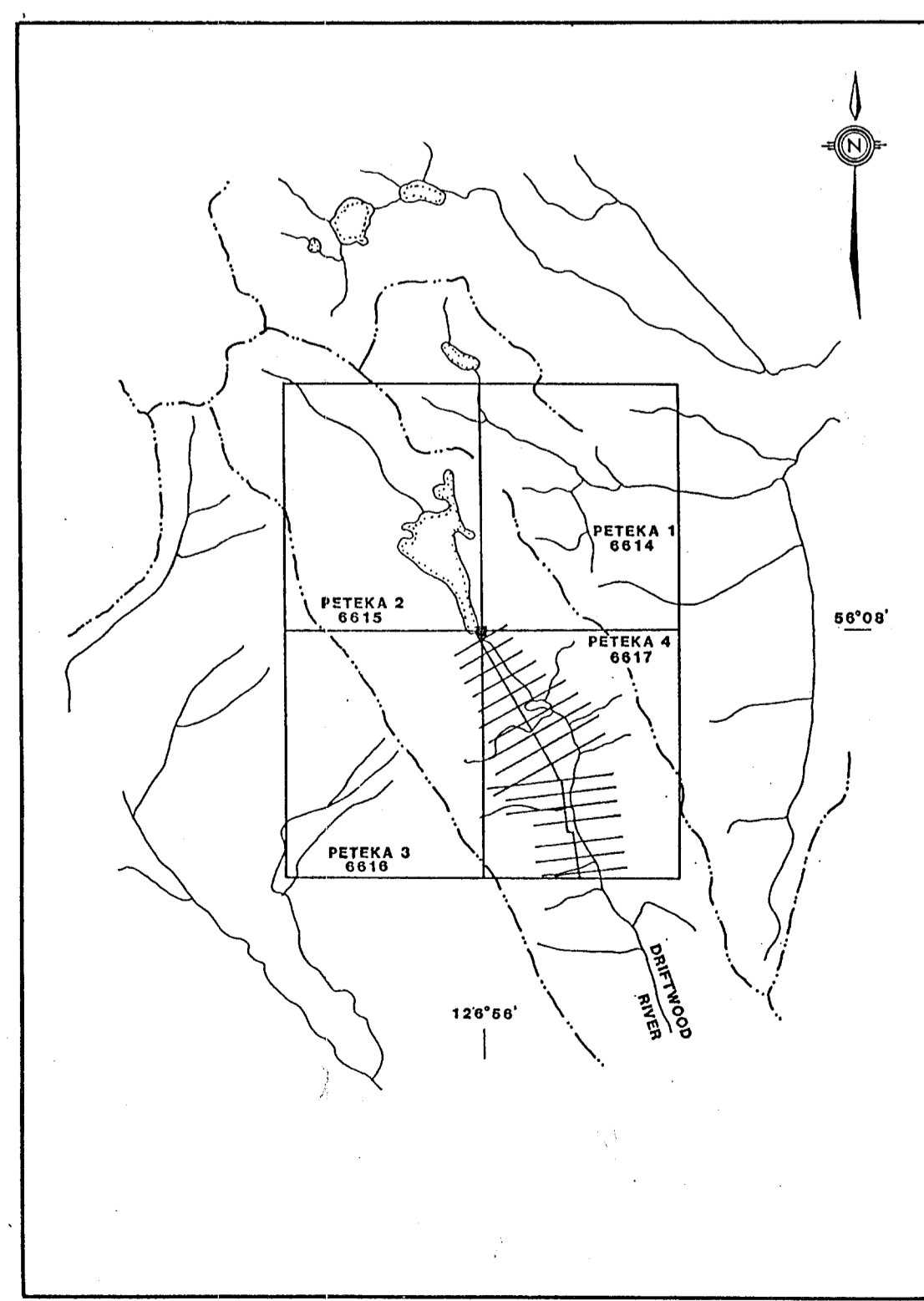
<b>Suncor</b> Inc. Resources Group		COAL AND MINERALS DEPARTMENT	
<b>BEAR LAKE PROJECT</b>			
PETEKA CLAIMS 3 & 4			
GEOCHEMICAL RESULTS			
Cu, Pb, Zn			
ZINC CONTOURS IN PPM			
DATE	SCALE	N.T.S.	DRAWING No.
AUGUST 1985	1:5000	94D/2E	PT 016

PETKA#3

PETKA#4

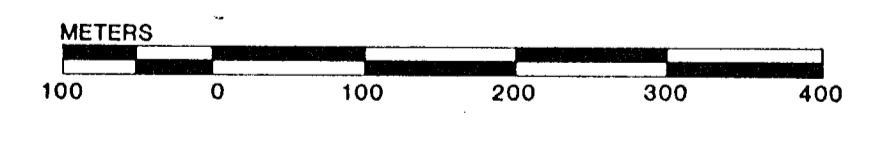


KEY MAP



GEOLOGICAL BRANCH ASSESSMENT REPORT

14,424



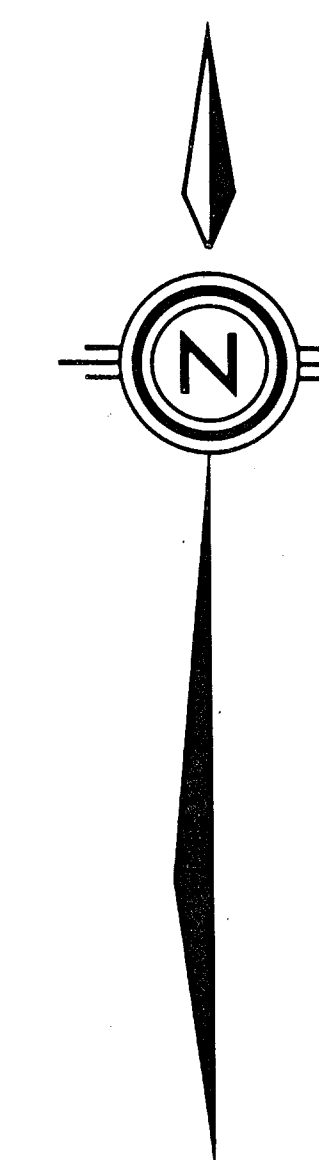
**Suncor** Inc. Resources Group COAL AND MINERALS DEPARTMENT

**BEAR LAKE PROJECT**  
PETEKA CLAIMS 3 & 4  
SOIL SAMPLE LOCATIONS

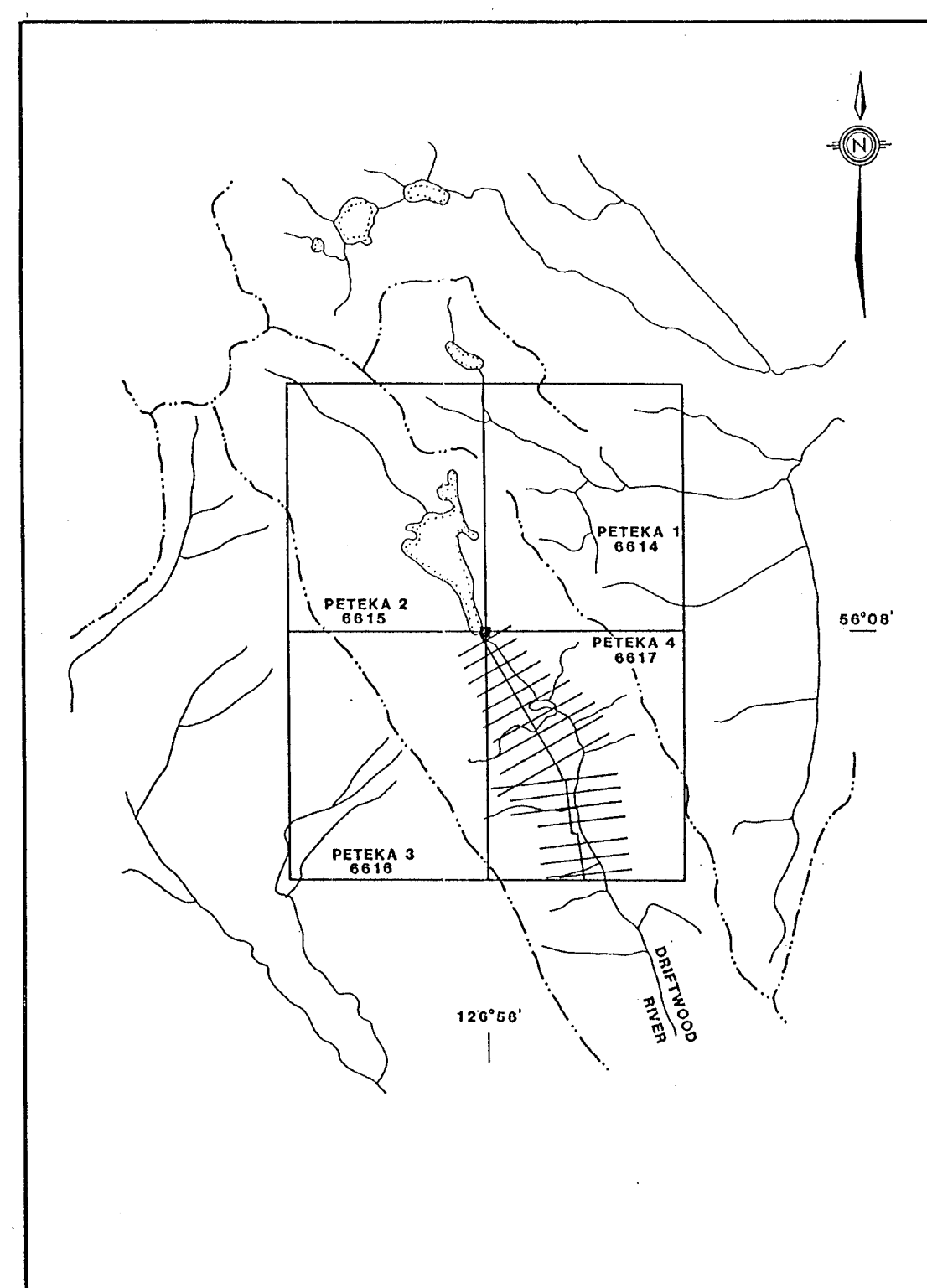
DATE AUGUST 1985	SCALE 1:5000	N.T.S. 94D/2E	DRAWING No. PT 017
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PETKA #1

PETKA#2



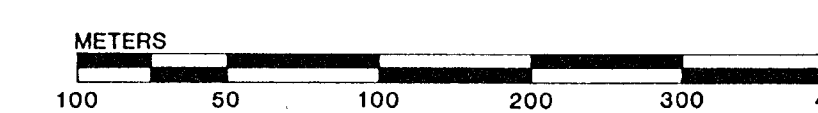
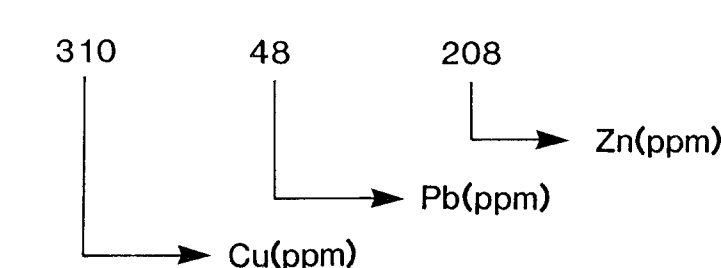
KEY MAP



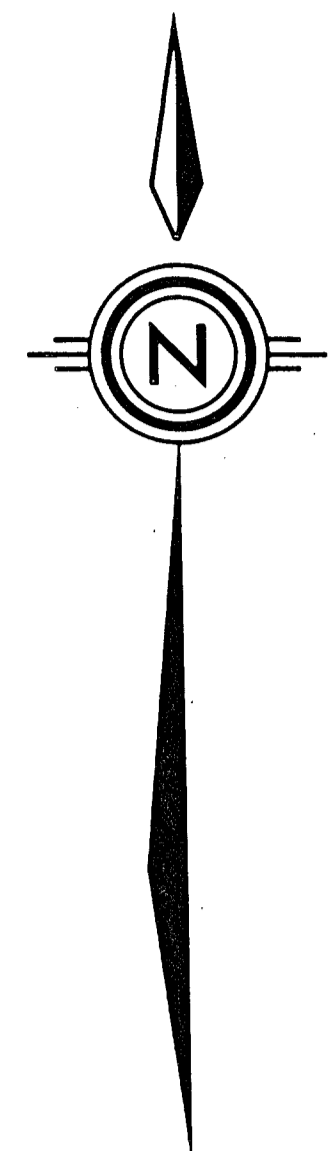
GEOLOGICAL BRANCH  
ASSESSMENT REPORT

14,424

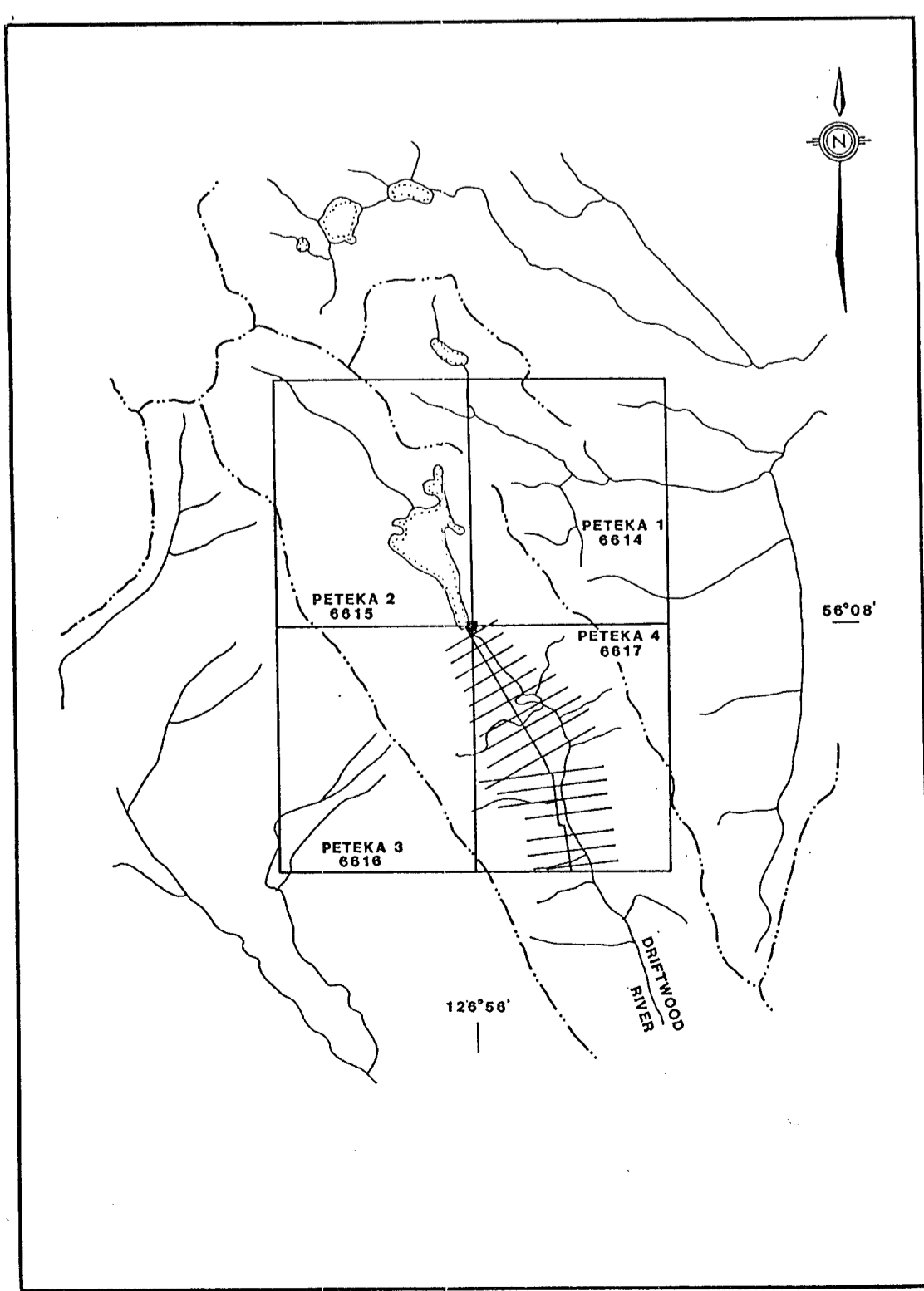
LEGEND



<b>Suncor</b> Inc. Resources Group		COAL AND MINERALS DEPARTMENT	
<b>BEAR LAKE PROJECT</b>			
PETEKA CLAIMS 1 & 2			
SOIL GEOCHEMICAL RESULTS			
Cu,Pb,Zn			
DATE AUGUST 1985	SCALE 1:5000	N.T.S. 94D/2E	DRAWING No. PT 018

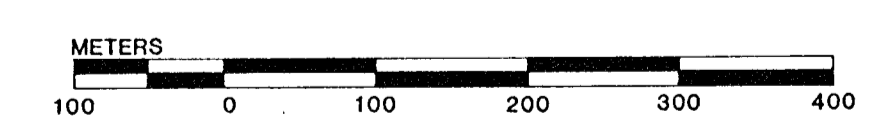


KEY MAP

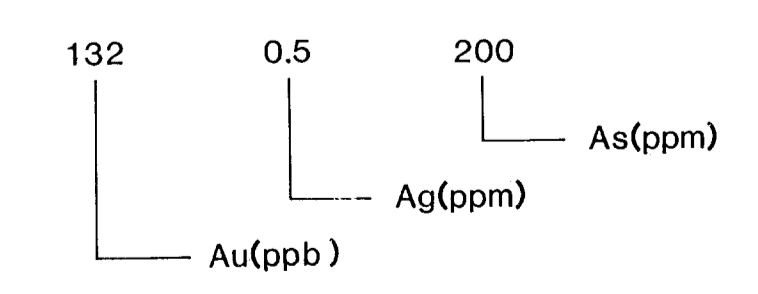


GEOLOGICAL BRANCH  
ASSESSMENT REPORT

14,424



LEGEND



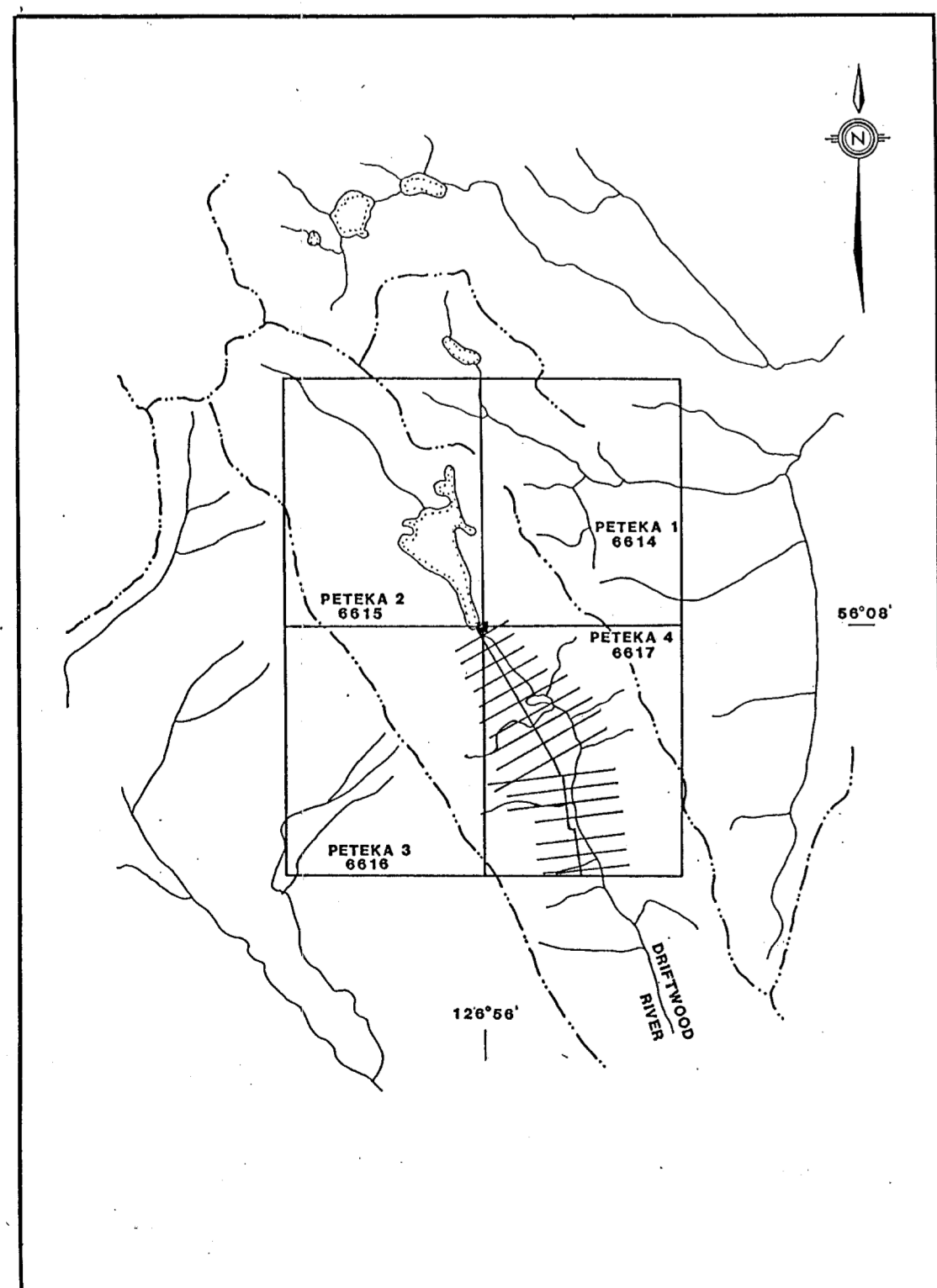
Note: All As results ≤ 100ppm except where noted

Inc. Resources Group		COAL AND MINERALS DEPARTMENT	
<b>BEAR LAKE PROJECT</b> PETEKA CLAIMS 1 & 2 SOIL GEOCHEMICAL RESULTS Au, Ag, As			
DATE	SCALE	N.T.S.	DRAWING No.
AUGUST 1985	1:5000	94D/2E	PT 019

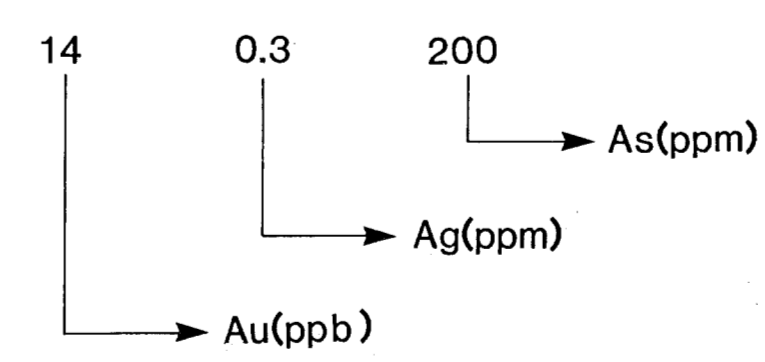




KEY MAP



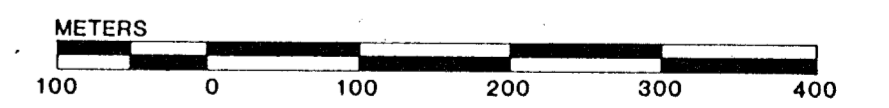
LEGEND



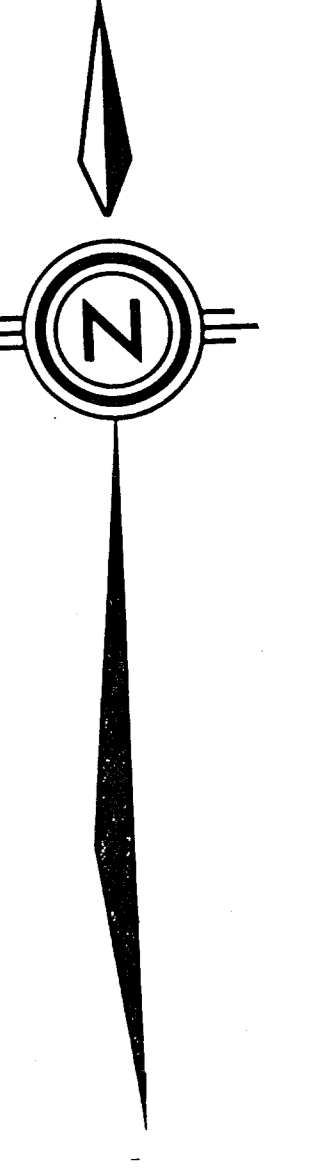
Note: "-" sign indicates less than.  
 All As values  $\leq$  100ppm As except where noted.  
 Gold contours in ppb.

GEOLOGICAL BRANCH  
 ASSESSMENT REPORT

14,424

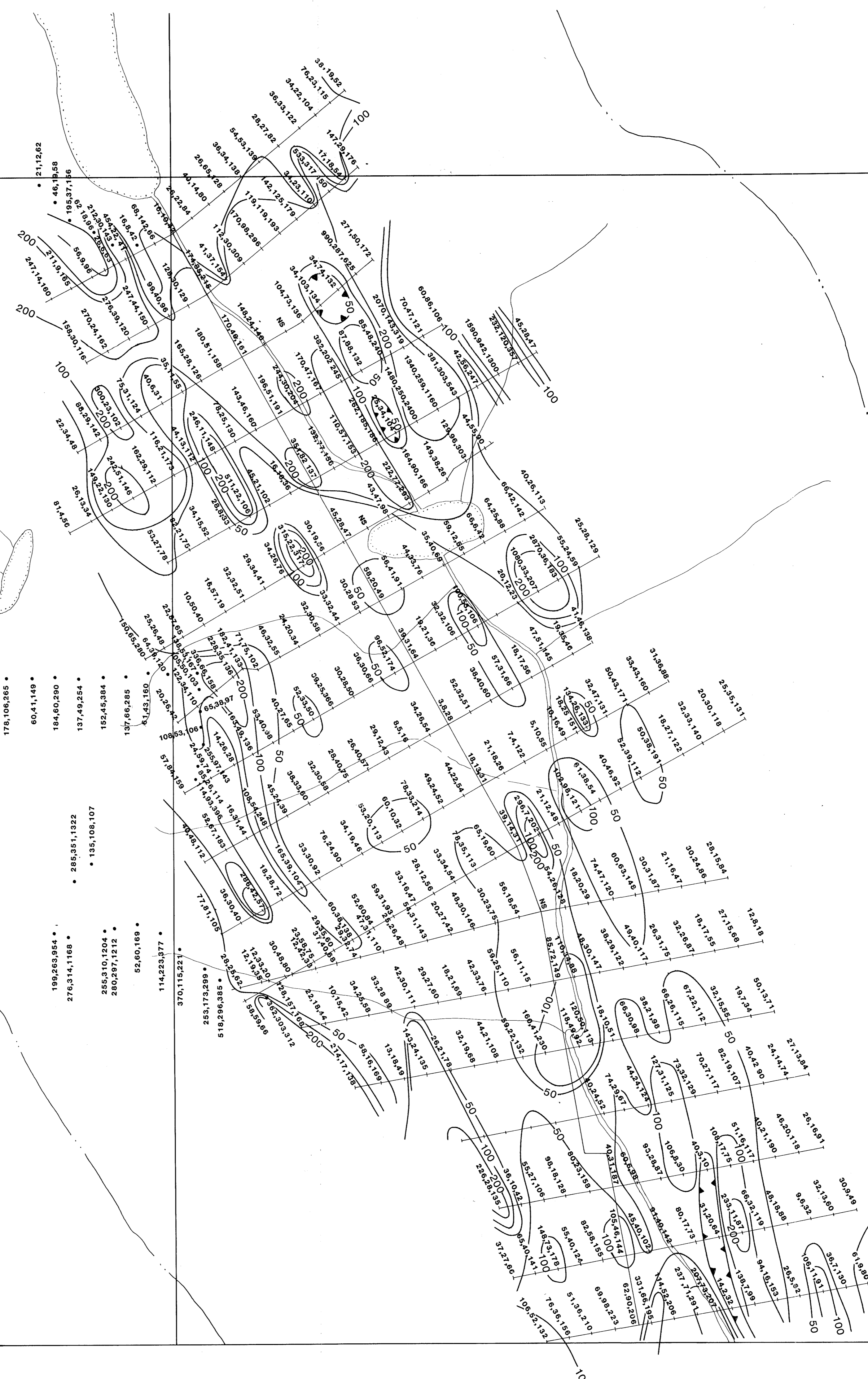


Suncor Inc. Resources Group		COAL AND MINERALS DEPARTMENT	
<b>BEAR LAKE PROJECT</b> PETEKA CLAIMS 3 & 4 GEOCHEMICAL RESULTS Au, Ag, As GOLD CONTOURS			
DATE AUGUST 1985	SCALE 1:5000	N.T.S. 94D/2E	DRAWING No. PT 012



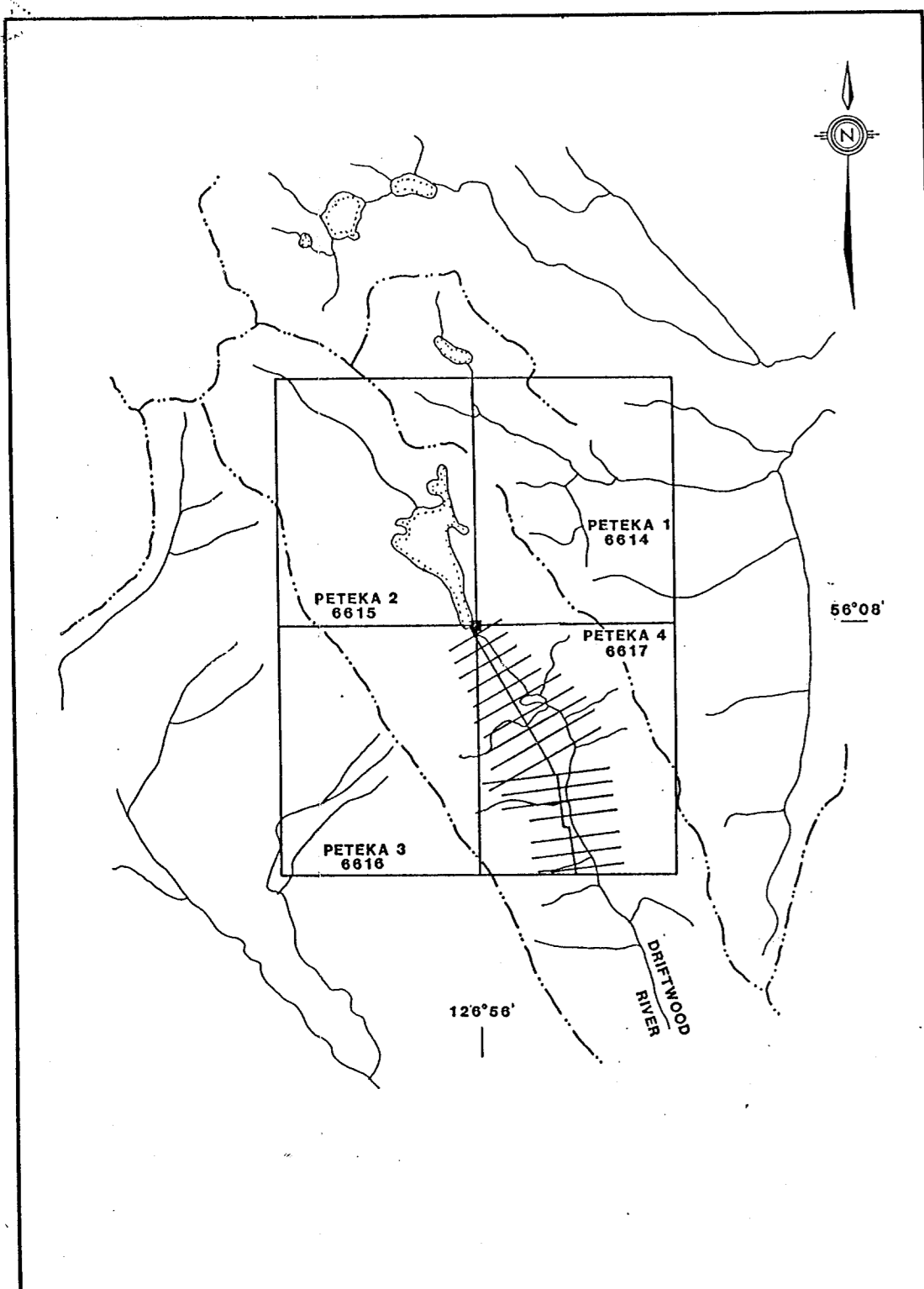
PETKA#3

PETKA#4

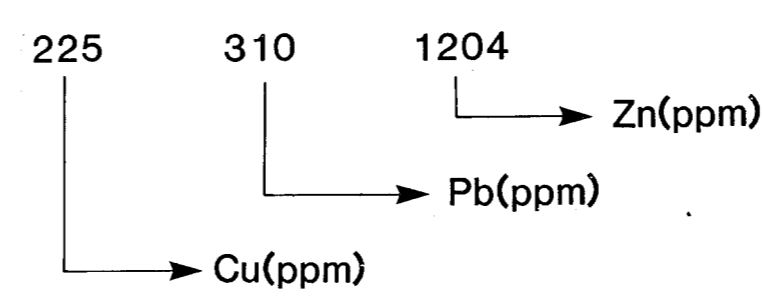


- 455,565,270 •
- 77,22,124 •
- 195,09 138 •
- 165,11,183 •
- 178,100,265 •
- 80,41,149 •
- 184,80,280 •
- 137,45,254 •
- 135,108,107 •
- 137,66,285 •
- 83,43,180 •
- 199,269,954 •
- 276,344,168 •
- 285,351,1322 •
- 285,310,1204 •
- 280,297,1212 •
- 52,60,168 •
- 114,233,377 •
- 370,116,251 •
- 253,172,206 •
- 616,286,818 •

KEY MAP

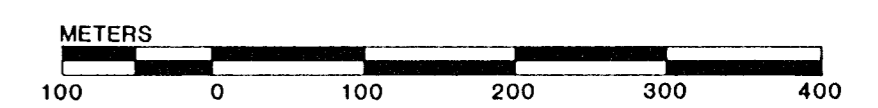


LEGEND



GEOLOGICAL BRANCH  
ASSESSMENT REPORT

14,424



<b>Suncor</b> Inc Resources Group		COAL AND MINERALS DEPARTMENT	
<b>BEAR LAKE PROJECT</b>			
PETEKA CLAIMS 3 & 4			
GEOCHEMICAL RESULTS			
Cu,Pb,Zn			
COPPER CONTOURS IN PPM			
DATE AUGUST 1985	SCALE 1:5000	N.T.S. 94D/2E	DRAWING No. PT 014