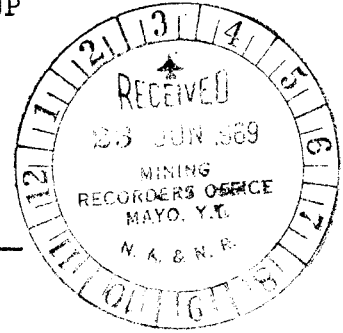


COMINCO LTD.

EXPLORATION

WESTERN DISTRICT

GEOLOGICAL AND GEOCHEMICAL REPORT  
ON THE BEAVER A GROUP AND BEAVER B GROUP  
OF MINERAL CLAIMS  
SITUATE AT:  
64°12.5' N LATITUDE  
134°35' W LONGITUDE  
NTS: 106 D/2  
IN THE MAYO MINING DISTRICT OF THE  
YUKON TERRITORY



Located claims on which assessment credits are requested:

<u>Claim</u>	<u>Record No.</u>	<u>Date Recorded</u>	<u>Assessment Credit</u>	<u>Amount</u>
<u>BEAVER A GROUP</u>				
BEAVER 101	Y 27442	July 8, 1968	2 years	\$ 200
102	Y27443	"	"	"
103	Y27444	"	"	"
104	Y27445	"	"	"
108	Y27449	"	"	"
109	Y27450	"	"	"
110	Y27451	"	"	"
111	Y27452	"	"	"
112	Y27453	"	"	"
113	Y27454	"	"	"
114	Y27455	"	"	"
115	Y27456	"	"	"
116	Y27457	"	"	"
117	Y27458	"	"	"
118	Y27459	"	"	"
119	Y27460	"	"	"
<u>BEAVER B GROUP</u>				
BEAVER 105	Y27446	July 8, 1968	2 years	\$ 200
106	Y27447	"	"	"
107	Y27448	"	"	"
120	Y27461	"	"	"
121	Y27462	"	"	"
122	Y27463	"	"	"
123	Y27464	"	"	"
124	Y27465	"	"	"
TOTAL			48 claim years	\$ 4,800

Work was done on these claims from July 7, 1968 through July 20, 1968 incl.

REPORT BY

A. A. JOHNSON, B.Sc.

UNDER SUPERVISION OF

J. RICHARDSON, P. ENG.

This report has been examined by the Geological Evaluation Unit. Approved as to technical worth by:

*[Signature]*  
RESIDENT GEOLOGIST

Approved as to cost in the amount of: \$ 4,800.00

*[Signature]*  
RESIDENT MINING ENGINEER

Accepted as representation work under Section 53(4) Yukon Quartz Mining Act.

*[Signature]*  
COMMISSIONER OF YUKON

GEOLOGICAL AND GEOCHEMICAL REPORT  
ON THE BEAVER A GROUP AND BEAVER B GROUP  
OF MINERAL CLAIMS

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(1) Location Map	1" = $\frac{1}{2}$ mile
(2) Geology Map	1" = 400'
(3) Geochemistry - Cu	1" = 400'
(4)       "       - Lead	1" = 400'
(5)       "       - Zinc	1" = 400'
(6) Claim Map	1" = 400'
REFERENCES	
(1) GSC Map 62-7, Nash Creek 1" = 4 mile 106 D	
(2) GSC Map 58-4 Scougale Creek 1" = 1 mile 106 D-2	
(3) GSC Geochemical Series (Circ. 1965) for Keno Area.	

C O M I N C O L T D.

EXPLORATION

WESTERN DISTRICT

GEOLOGICAL AND GEOCHEMICAL REPORT  
ON THE BEAVER A GROUP AND BEAVER B GROUP  
OF MINERAL CLAIMS

INTRODUCTION

The Beaver property was staked by Cominco Ltd. in 1968 after an evaluation of their 1967 reconnaissance geological and geochemical prospecting in the Beaver River area. The area covered by the claims was believed to contain the source of strong geochemical lead and zinc anomalies and moderately high copper anomalies. The area was also judged to be geologically promising as it encompassed a number of rock types which were not expected in the Yukon group (to which the G.S.C. had assigned the area) and which could be host rocks for significant amounts of mineralization. A combined geological and geochemical survey was instituted to test the claims subsequent to their being staked in 1968.

SUMMARY

The geological and geochemical investigation of the Beaver group in 1968 resulted in a less favourable prognosis for the area than had been hoped for. The geological environment appears to be that of a continental shelf region which has been only slightly metamorphosed and intruded by small diorite sills (west of the property boundary). Only one andesite flow was noted in the mapping; the rest of the rocks being comprised of argillite and quartzite with the exception of a small but persistent band of crystalline, furruginous dolomite.

Lead, zinc and copper anomalies were defined by the geochemical survey, however, the results are highly ambiguous as there is little coincidence between the various types of anomalies. Also, some rock samples of porous argillite and fault breccia assayed as high as 7000 ppm. zinc and 800 ppm copper. No explanation was found for the lead anomaly and no mineralization was observed in the course of this property evaluation.

SURVEY SPECIFICATIONS

The following personnel were employed during the survey:

Mr. A.A. Johnson, B.Sc. (Geologist)  
1199 West Pender Street,  
Vancouver 1, B. C.

Mr. S. Butrenchuk (Exploration Ass't.)  
BSc.  
1199 West Pender Street,  
Vancouver 1, B. C.

The survey was conducted from June 7, 1968 to June 20, 1968.

The geological and geochemical surveys were conducted concurrently using claim location lines as base lines and turning lines from them at 400 ft. intervals. The base lines and survey lines were chain and compassed and flagged at 100 ft. intervals. A. A. Johnson and S. Butrenchuk alternated each day between soil sampling and geological mapping.

Soil samples were taken at 100 ft. intervals along the cross-lines and immediately placed in Kraft envelopes. The samples were dried in the field before being shipped to Cominco's laboratory in Vancouver. In all cases an attempt was made to sample the "B" soil horizon although this was usually impossible below the 2500' contour interval and in a few other isolated areas on the property. In these cases an earthy black soil was taken for the sample and it does not appear to have produced any spurious anomalies.

At the laboratory the samples were completely dried and screened at 80 mesh before being analyzed for copper, lead and zinc by standard atomic absorption methods.

## GEOLOGY

### A. INTRODUCTION

The geological mapping of the Beaver claims indicates that they are underlain by rocks which do not rightly belong to the Yukon group to which they were assigned by the G.S.C. This has been confirmed in personal conversation with Dr. L.H. Green who mapped the area. Dr. Green states that these rocks do not seem to correlate with any known units in the area. Since they are lightly sheared and metamorphosed (greenschist facies) they are definitely pre-ordovician and are probably upper or middle Cambrian in age. For the purpose of this report these rocks are considered to belong to the Beaver River formation and they are further subdivided into members as indicated below:

### B. TABLE OF FORMATIONS

#### Upper Cambrian(?)

- Beaver River Formation
  - Carbonate Member
    - (a) dolomite unit
    - (b) andesite unit
  - Argillite member
    - (a) porous unit
    - (b) massive unit
  - Quartzite member

#### Lithologic Descriptions:

##### Carbonate Member

Only one major outcrop of andesite was observed on the property and, due to its proximity to, and the fact that it appears to grade laterally into, ferruginous dolomite, it has been included as part of the carbonate unit. It is this writer's opinion that the fact that this andesite is distinctly pillowed and has very gradational boundaries with the dolomite unit indicates that it was probably a subaquatic extrusion which penetrated unconsolidated muds and may have been instrumental in providing the magnesium required for the formation of dolomite.

The dolomite itself is rather unique in that it is coarsely crystalline with long (up to  $\frac{1}{4}$  inch) interlocking blades of dolomite which, in thin section, enclose tiny rounded grains of quartz. This tends to support the hypothesis that it was originally a ferruginous and somewhat siliceous carbonate mud which has been reconstituted to ferruginous dolomite. Minor pyrrhotite and a few specks of chalcopyrite have been observed in this dolomite.

##### Argillite Member

The argillite member is divided into two easily distinguished units. The massive argillite is an ordinary fine-grained black argillite with minor quartz-rich lenses. It is characterized, in this area by the presence of sub-angular holes which appear to be pseudomorphous after a carbonate mineral (dolomite?).

The porous argillite is a very strange rock whose texture has not yet been adequately explained. The rock is black in colour, extremely porous (probably greater than 50% pore space), and forms a hard platy talus which indicates a highly "welded" internal structure. Chemical analysis of selected samples of this rock gave higher than background values for copper and zinc and one piece in particular whose pores appeared to be filled with dolomite gave an analysis of 7000 ppm zinc and 800 ppm copper but only nominal lead. This sample came from a point very close to the fault and it may simply reflect the presence of a transported geochemical anomaly rather than abnormally high background values for this rock unit.

### Quartzite Member

The quartzite member has a distinct facies relationship with the argillite member as thin beds of argillite can be found in some quartzite outcrops. The quartzite itself is a grey-green to steel black rock, usually medium-grained in texture and uniform in composition (in hand specimen). The quartzite member appears to form an upper limit to any potential host rocks on the property.

### C. STRUCTURAL GEOLOGY

No folding has been outlined by this mapping program but one major fault appears to transect the property in a NNW direction. West of this fault bedding is quite regular and dips to the southwest about 45°. East of the fault the bedding appears to be more irregular and it is disrupted by minor, more northerly trending faults. These minor faults contain limonite-welded breccia which, in one case, assayed 700 ppm copper and 7500 ppm zinc. There is no known connection, however, between these values and mineralization. The fault breccias could merely be acting as dilatant zones where metal ions from the enclosing argillites may accumulate.

### MINERALIZATION

No significant mineralization was observed in the property. Minor specks of pyrrhotite and chalcopyrite were observed in the dolomite unit and one spec of chalcopyrite was found in massive argillite.

### GEOCHEMISTRY

#### A. RESULTS

##### General

The results of the geochemical survey were in no way conclusive as the various anomalies have unique patterns and are only sporadically coincident. In general, the anomalies trend in the same direction as the strike of the formations, but the lead anomaly, for example, transects the main fault without apparent displacement while the copper anomaly is sharply bent along the fault. The main zinc anomaly appears off by itself in the southeast corner of the property.

##### Copper

The background value for copper in this survey has been calculated to be 35 ppm and threshold is considered to be twice that; 70 ppm. Copper values are therefore moderately anomalous between 70 and 140 ppm, definitely anomalous between 140 and 560 ppm and highly anomalous above 560 ppm.

Only three samples were found to be highly anomalous and of these, two appear to be isolated from the other copper anomalies in an area underlain by massive argillite. The other high value supports anomalous values along the main fault zone. Most of the definitely anomalous values are supported by moderately anomalous "haloes" and conform very closely to the major strike of the formations. These anomalies are found within both the massive argillite and the porous argillite.

##### Lead

Background for lead in this survey has been calculated to be 25 ppm and the 50 ppm (threshold) contour on the lead geochemistry map outlines a zone over a mile long and about 600 feet or more wide. Even the 100 ppm contour which defines the lower limit of the moderately anomalous zone does not significantly reduce the length of the anomaly although the width is reduced almost in half. Within this zone there are several strongly anomalous (400-1600 ppm) to highly anomalous (+1600 ppm; peak 8000 ppm) zones.

Zinc

Statistically, zinc is the most highly anomalous element of the three which were analyzed in the survey, however, the main zinc anomaly is so far removed from the other anomalies and is located in a rock-type which may have such a high background amount of zinc that the anomalies cannot be considered as very reliable indications of mineralization.

There were so many high values in the S.E. corner of the property that they had to be temporarily disregarded in calculating background for the rest of the property. For most of the property background in zinc is 250 ppm and threshold is 500 ppm. However in the S.E. corner these should be considered to be 500 and 1000 respectively.

The zinc anomalies in the southeast corner of the property are probably the result of seepage and precipitation by oxidation along a lithologic contact or talus base. The highest value recorded in this area was 15,000 ppm or 1.5% zinc in soil. Samples with an excess of 1000 ppm Zn (0.1%) are common in this area.

The anomalies in the more westerly part of the property peak around 2000 ppm and in general they follow very closely the strike of the formations. It is quite probable that they reflect higher than average background concentrations of zinc in the underlying rock.

CONCLUSIONS

The geological environment of the Beaver claims appears to be highly metalliferous. However, no mineralization has been seen to date and all but the lead anomalies have viable explanations that do not require the presence of economic quantities of metallic sulphides in the underlying rock. Since the lead anomaly appears to be more closely associated with the dolomite unit than any other unit, it may be that parts of this unit, are abnormally high in lead content.

Report By A. A. Johnson  
A. A. Johnson, BSc.

Endorsed By S. J. Pedley  
S. J. Pedley, P. Eng.,

for: J. Richardson, P. Eng.

AAJ:mk  
June 12, 1969  
Distribution:

Mining Recorder	3
Vancouver Exploration	1

ATTACHMENTS

- (1) Location Map, 1" = 1/2 mile. and 1" = 10 mi.
- (2) Geology Map, 1" = 400'
- (3) Geochemistry - Copper 1" = 400'
- (4) " - Lead 1" = 400'
- (5) " - Zinc 1" = 400'
- (6) Claim Map, 1" = 400'.

EXHIBIT "A"

GEOLOGICAL AND GEOCHEMICAL REPORT  
ON THE BEAVER A GROUP AND BEAVER B GROUP  
OF MINERAL CLAIMS

STATEMENT OF EXPENDITURES

The following is a true account of expenditures incurred by Cominco Ltd. in conducting of geological and geochemical survey on the Beaver 101-124 claims (Y27442-27465 incl.) in the Beaver River area (NTS: 106 D/2) of the Mayo Mining District of the Yukon Territory.

Geochemical Analyses	1,474 samples @ \$1.75	\$ 2,579.50
Staff Time		
A.A. Johnson	2 weeks @ \$200	400.00
S. Butrenchuk	2 weeks @ \$200	400.00
Camp Costs - tents, radio, food, tools		450.00
Transportation - helicopter	3 trips @ \$450	<u>1,350.00</u>
	TOTAL	\$ 5,179.50

Signed *S.J. Pedley*  
S.J. Pedley P. Eng.

For: J. Richardson, P. Eng.

This is EXHIBIT "A" to the Statutory Declaration of S.J. Pedley, declared before me the 16<sup>th</sup> day of June, 1969, A.D.

*[Signature]*  
.....  
A Commissioner for taking Affidavits for British Columbia.

DOMINION OF CANADA:  
PROVINCE OF BRITISH COLUMBIA.  
To Wit:

In the Matter of

STATUTORY DECLARATION RELATING TO  
EXPENDITURES ON A GEOLOGICAL -  
GEOCHEMICAL SURVEY ON THE BEAVER  
MINERAL CLAIMS, PROPERTY OF  
COMINCO LTD., MAYO MINING DIVISION,  
YUKON TERRITORY

I, STANLEY J. PEDLEY, Professional Engineer

of the City of Vancouver

in the Province of British Columbia, do solemnly declare that

1. I do personally know A. A. Johnson who prepared the accompanying geological - geochemical report as a result of a survey carried out on certain mineral claims situated in the Mayo Mining Division, Yukon Territory, and owned by Cominco Ltd.
2. Copies of the said report are being filed with the Mining Recorder at Mayo.
3. Attached hereto and marked with the letter "A" upon which I have signed my name at the time of declaring hereof, is a statement of expenditures incurred in connection with the geological - geochemical survey of the said claims showing in addition the dates during which those making the said survey performed their work.

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the City  
of Vancouver, in the  
Province of British Columbia, this 16<sup>th</sup>  
day of June, 1969, A.D.

*St. J. Pedley*

*[Signature]*

A Commissioner for taking Affidavits for British Columbia or  
~~PROVINCIAL CLERK OF THE COURT OF BRITISH COLUMBIA~~

C O M I N C O L T D.

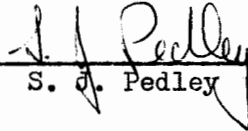
EXPLORATION

WESTERN DISTRICT

STATEMENT OF QUALIFICATIONS

A. A. Johnson was responsible for conducting the geological - geochemical survey described herein. Mr. Johnson is a graduate Geologist from Mount Allison University, Nova Scotia B.Sc. 1963. He has worked on various field projects as an Exploration Geologist for Cominco since early 1967 and I consider him a competent and experienced Geologist.

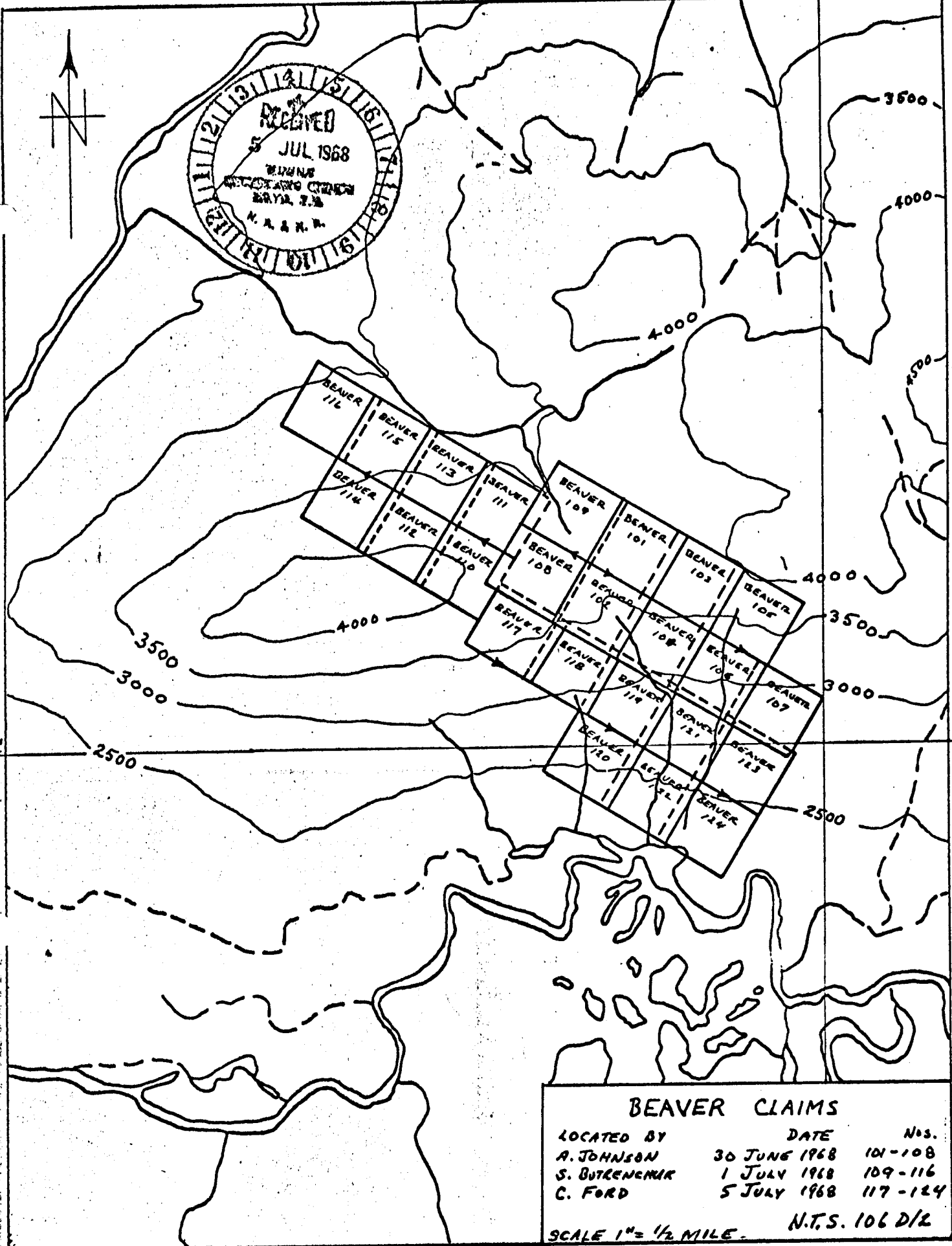
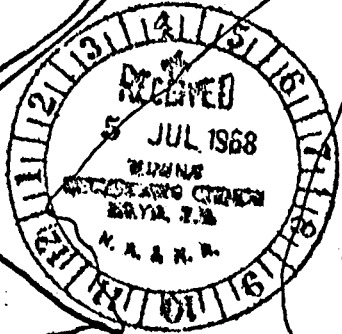
Signed:



S. J. Pedley P.Eng.

For:

J. Richardson P.Eng.



BEAVER CLAIMS		
LOCATED BY	DATE	Nos.
A. JOHNSON	30 JUNE 1968	101-108
S. BUTKENCNIK	1 JULY 1968	109-116
C. FORD	5 JULY 1968	117-124
SCALE 1" = 1/2 MILE.		N.T.S. 106 D/2



Drawn by:		Traced by:	
Revised by	Date	Revised by	Date

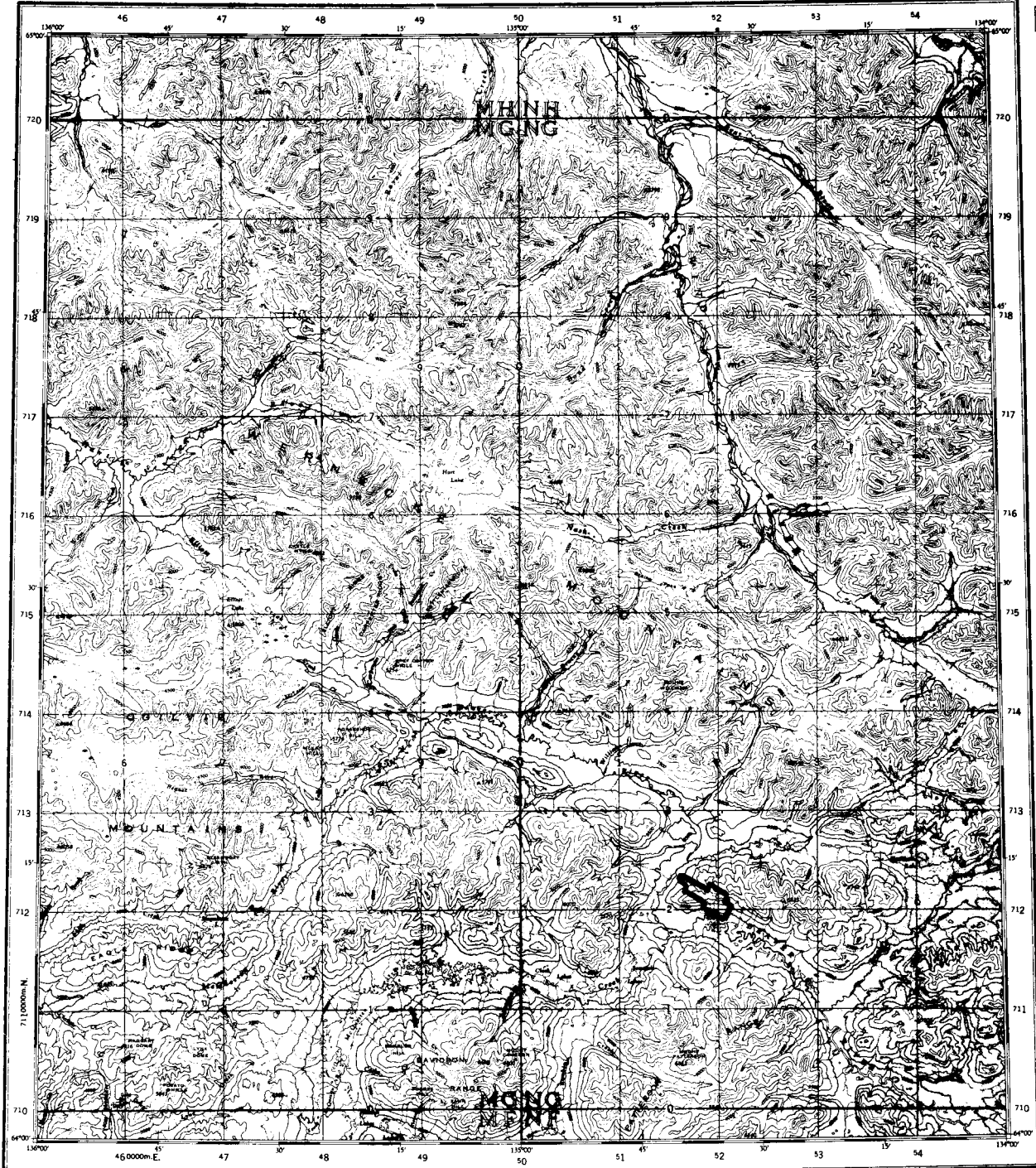
# BEAVER CLAIMS

LOCATION MAP

106 D/2

Scale: 1" = 1/2 mile	Date: July 1968	Plate: BR68-1
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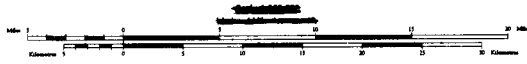
Refer to the  
Map No. 106 D  
EDITION 1 AND  
EDITION 2



THE ORIGINATOR OF THE COMPASS NEEDLE 1511  
Produced and revised by the Survey and Mapping Branch,  
Department of National Defence, Ottawa, from an  
aerogram taken in 1952.

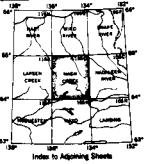
Universal Transverse Mercator Projection  
Contour interval 500 Feet  
Elevations in Feet above Mean Sea Level  
North American Datum 1927

**NASH CREEK**  
YUKON TERRITORY



- REFERENCE
- Highway
  - Trail or path
  - Water
  - Marsh
  - Swamp
  - Ice
  - Permafrost
  - Perennial snow
  - Seasonal snow

- REFERENCE
- Stream
  - Intermittent stream
  - Marsh
  - Swamp
  - Ice
  - Permafrost
  - Perennial snow
  - Seasonal snow



13	14	15	16
12	11	10	9
5	6	7	8
4	3	<u>2</u>	1

**N.T.S. GRID REFERENCE**

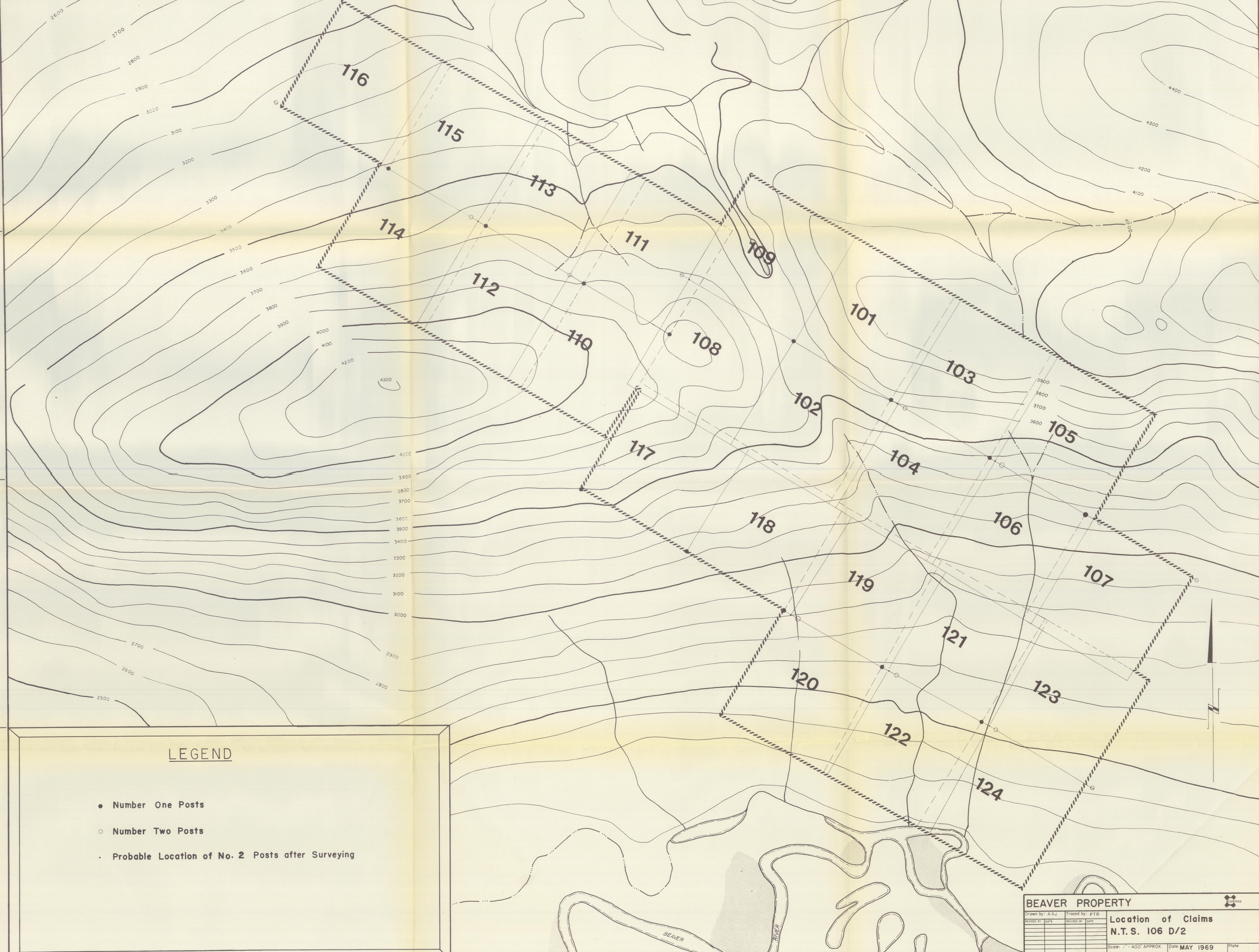


Drawn by: <i>AAJ</i>	Traced by:
Revised by: _____	Date: _____
Revised by: _____	Date: _____
Revised by: _____	Date: _____
Revised by: _____	Date: _____

*BEAVER PROPERTY*  
*LOCATION MAP*

*NTS 106 D/2*

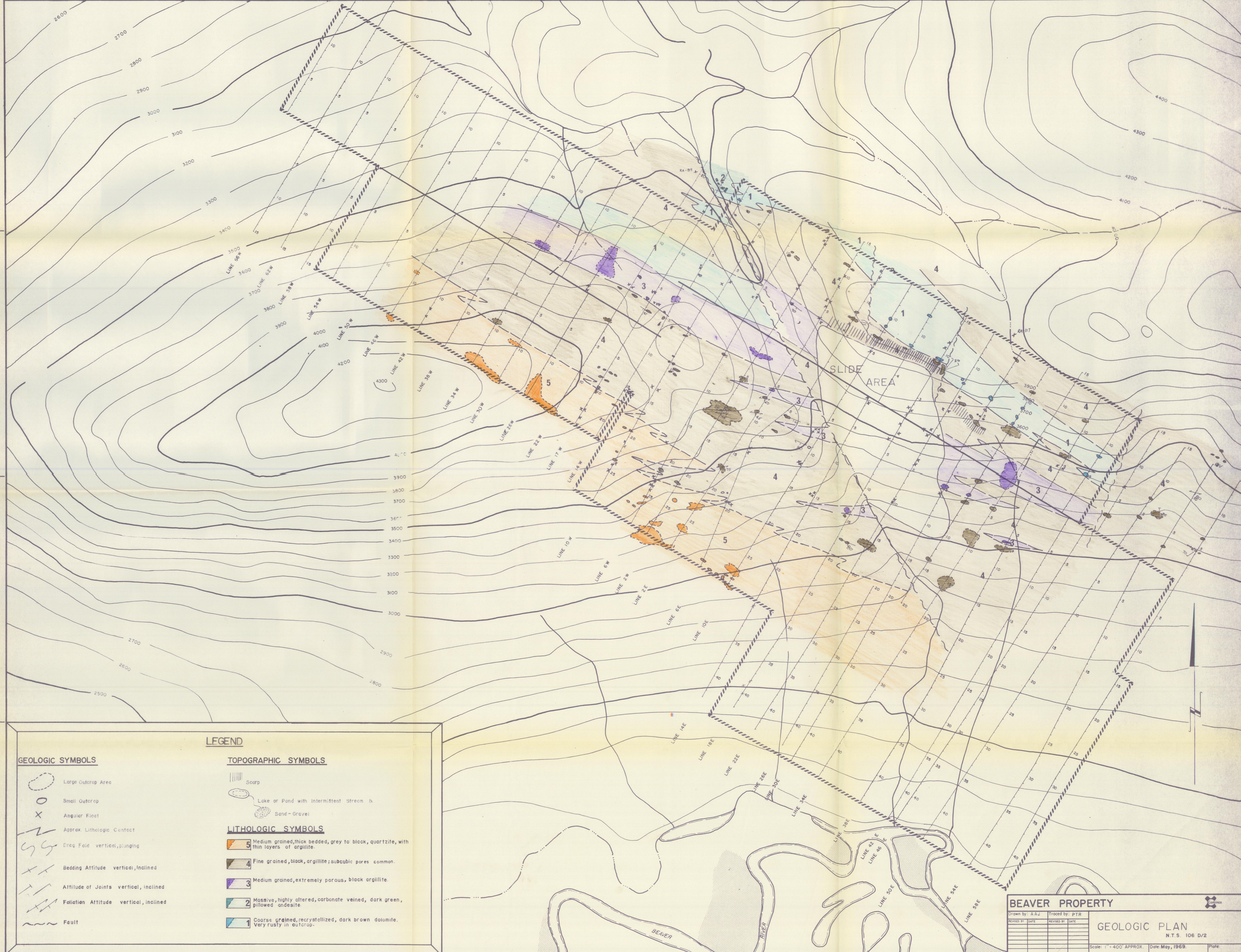
Information plotted on overlay by: _____	Date: _____	Scale: <i>1" = 10 miles</i>	Date: <i>June 1969</i>	Plate: _____
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**LEGEND**

- Number One Posts
- Number Two Posts
- Probable Location of No. 2 Posts after Surveying

<b>BEAVER PROPERTY</b>		<b>Location of Claims</b>	
N.T.S. 106 D/2			
Drawn by: A.A.J.	Traced by: P.T.R.	Scale: 1" = 400' APPROX	Date: MAY 1969
Revised by: DATE	Revised by: DATE		



**LEGEND**

**GEOLOGIC SYMBOLS**

- Large Outcrop Area
- Small Outcrop
- Angular Flint
- Approx. Lithologic Contact
- Dip Fold vertical, plunging
- Bedding Attitude vertical, inclined
- Attitude of Joints vertical, inclined
- Foliation Attitude vertical, inclined
- Fault

**TOPOGRAPHIC SYMBOLS**

- Scarp
- Lake or Pond with Intermittent Stream
- Sand-Gravel

**LITHOLOGIC SYMBOLS**

- 5 Medium grained, thick bedded, grey to black, quartzite, with thin layers of argillite.
- 4 Fine grained, black, argillite; subcubic pores common.
- 3 Medium grained, extremely porous, black argillite.
- 2 Massive, highly altered, carbonate veined, dark green, pillowed andesite.
- 1 Coarse grained, recrystallized, dark brown dolomite. Very rusty in outcrop.

**BEAVER PROPERTY**

Drawn by: AAJ	Traced by: PTR
Revised by: DATE	Revised by: DATE

**GEOLOGIC PLAN**  
N.T.S. 106 D/2

Scale: 1" = 400' APPROX. Date: May, 1969. Plate



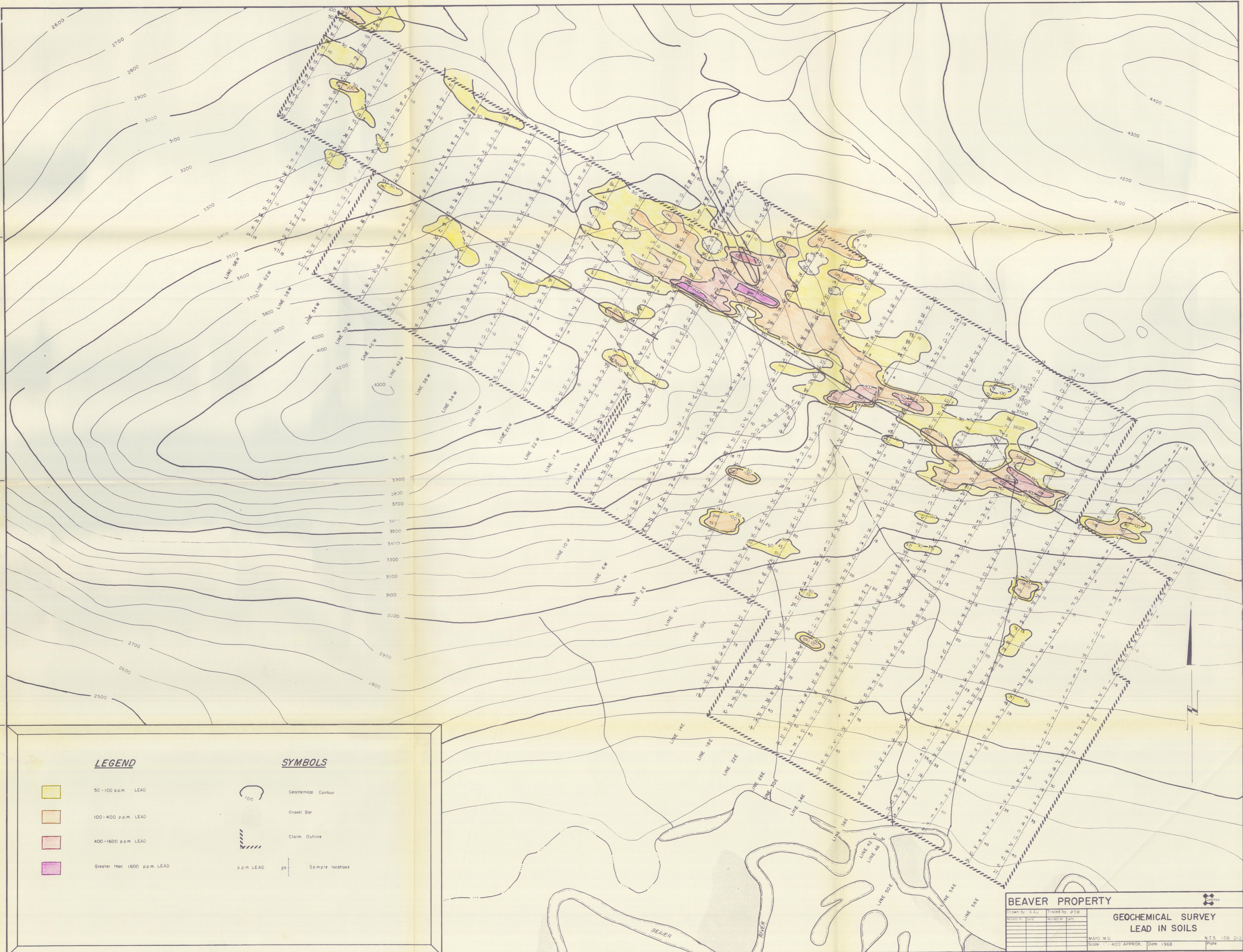
**LEGEND**

- 70-140 p.p.m. Copper
- 140-560 p.p.m. Copper
- Greater than 560 p.p.m. Copper

**SYMBOLS**

- Geochemical Contour
- Gravel Bar
- Claim Outline
- p.p.m. Copper
- 27 Sample location

BEAVER PROPERTY			
Drawn by: A.A.J.	Traced by: PTR		
Revised by: DATE	Revised by: DATE		
<b>GEOCHEMICAL SURVEY COPPER IN SOILS</b>		MAYO M.D.	NTS. 106 D/2
Scale: 1" = 400' APPROX.		Date: 1968	Plate



**LEGEND**

- 50-100 p.p.m. LEAD
- 100-400 p.p.m. LEAD
- 400-1600 p.p.m. LEAD
- Greater than 1600 p.p.m. LEAD

**SYMBOLS**

- Geochemical Contour
- Gravel Bar
- Claim Outline
- p.p.m. LEAD
- Sample locations

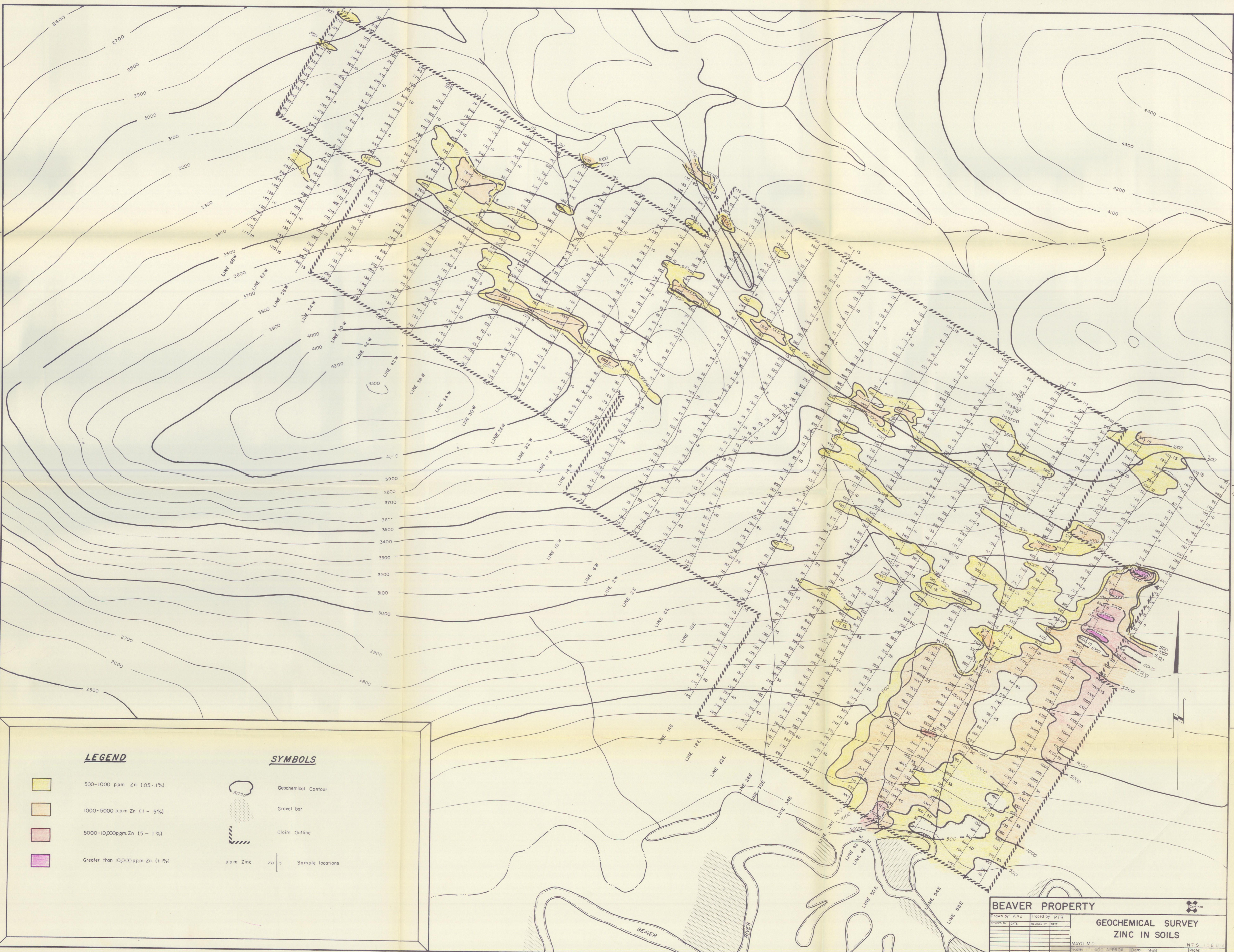
**BEAVER PROPERTY**

Drawn by: J.S.U. Traced by: PTR

REVISION #	DATE	REVISION #	DATE

**GEOCHEMICAL SURVEY  
LEAD IN SOILS**

MAYO M.D. N.T.S. 106 D/2  
Scale: 1" = 400' APPROX. Date: 1968 Plate



**LEGEND**

- 500-1000 ppm Zn (0.5 - 1%)
- 1000-5000 ppm Zn (1 - 5%)
- 5000-10,000 ppm Zn (5 - 1%)
- Greater than 10,000 ppm Zn (>1%)

**SYMBOLS**

- Geochemical Contour
- Gravel bar
- Claim Outline
- Sample locations

<b>BEAVER PROPERTY</b>		
Drawn by: A.A.J.	Traced by: PTR	
REVISED BY: DATE	REVISED BY: DATE	
<b>GEOCHEMICAL SURVEY ZINC IN SOILS</b>		
MAYO M.D.	Date: 400 APPROX	Date: 1968
	NTS	Plate