# 2286

**RE PORT** 

ON THE GEOCHEMICAL AND GEOLOGICAL SURVEY

ON THE

TI, BUD, MON, MO CLAIMS

FOR

ACHERON MINES LTD. (NPL)

# REPORT

ON THE GEOCHEMICAL AND GEOLOGICAL SURVEY

on the

TI, BUD, MON, MO CLAIMS

for

ACHERON MINES LTD (NPL)

Agilio Emploration Services Ltd.,

February, 1970

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STATISTICAL ANALYSIS (ZINC)

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Department of

Mines and Petroleum Resources

ASSESSMENT REPORT

NO. 2286 MAP

#### REPORT

#### ON THE GEOCHEMICAL AND GEOLOGICAL SURVEY

ON THE

TI, BUD, MON, MO CLAIMS

for

#### ACHERON MINES LTD (NPL)

#### INTRODUCTION

The Ti, Mon, Mo, and Bud claims held by Acheron Mines Ltd consists of a total of 56 contiguous mineral claims situated north of Holberg Inlet, west of Nahwitti Lake on northern Vancouver Island, British Columbia.

Reconnaissance geological and geochemical surveys were conducted during November, 1968.

In November and December, 1969, detailed geochemical work was conducted over the anomalous areas outlined previously and the reconnaissance geochemical survey was extended to the west.

The property was geologically mapped in detail with special attention being paid to differentiate the rock units in formations and groups in accordance with Dr. Müller's classification.

A total of 7 line miles of reconnaissance and 6 line miles of detailed soil sampling was completed.

The object of this report is to summarize all available information.

## LOCATION AND ACCESS

The claims are located at the western end of Nahwitti Lake between the Holberg road to the south and Nahwitti River to the north.

Co-ordinates are 127° 55' west longitude, and 50° 43' north latitude.

Access is by road from Port Hardy a distance of approximately 20 miles, then on foot approximately one mile to the group.

# PHYSIOGRAPHY

Relief is moderate with elevations rising to 2,000 feet above sea level. Most of the property is heavily timbered, with a few large areas of open swamp.

Overburden cover is extensive but appears quite thin over much of the property.

### CLAIMS

The property consists of 56 contiguous mineral claims:

Claim Name	Record Number
Ti 1 - 28	22334 - 361
Ti 29 - 34	23083 - 088
Ti 40 - 53	23810 - 823
Bud 1	25146
Mo 1 - 4	
Mon 1 - 4	

The surveys were conducted on all or portions of the following claims:

Bud 1. Ti 29. Ti 31 - 34 Ti 50 - 53

## **GEOLOGY**

#### Regional:

The area in which the current exploration activity is being concentrated is underlain by a west-northwest trending belt of Triassic volcanics and sediments. These have been intruded by several intrusive bodies, acid to intermediate in composition, of Jurassic and Tertiary age.

In a few small areas the older rocks are overlain by Cretaceous and Tertiary sediments and volcanics.

The youngest Triassic rocks, and those in which the Utah deposits occur, are referred to as the Bonanza Sub-group, consisting mainly of andesites and tuffs with agglomerate, argillite and limestone. These are underlain by the Quatsino Limestone with which numerous mineralized skarn zones are associated, and in turn by the Karmutsen Formation, consisting mainly of andesitic and basaltic volcanic flows.

The various units occupy an open syncline. Numerous faults cut the belt, the most prominent directions being west-northwest and northeast.

Two distinct types of mineral deposits are being explored in the region. Numerous deposits of the contact metamorphic and skarn variety are found associated with limestone bands near intrusive contacts.

Mineralization, consisting variously of copper, lead, zinc, iron and precious metals generally occurs in skarn zones developed along limestone-andesite contacts. Known deposits of this type are concentrated in the Nahwitti Lake area and northwest and east of Quatse Lake.

Copper mineralization is common in both the Karmutsen and Bonanza volcanics with concentrations generally associated with shearing and/or granitic intrusions. The major deposit being developed by Utah Construction & Mining Co. on their Bay Group consists of copper-molybdenum mineralization in strongly altered volcanics of the Bonanza Group and intrusive dikes and sills. Similar mineralization has been explored on the Hep Group of Utah's to the west, 2 miles south of the Ti Group. A molybdenum-copper deposit occurring in granitic intrusives and volcanics also occurs on the West Coast Mining property one mile west of the Ti claims.

#### General:

The mapped area lies along the northern limb of a northwesterly trending syncline which occupies the central section of northern Vancouver Island.

Extensive block faulting renders the structural setting highly complex, hence tracing of the different rock units outcropping in the area is difficult.

Besides minor sediments, consisting of candatone interbedded with conglomerate of Lower Cretaceous age, the main area is underlain by rocks belonging to the Vancouver Group which range in age from Upper Triassic to Jurassic (?). Dr. J. E. Müller's terminology was used to break the

Vancouver Group into distinct formations or sub-groups. has been made to measure the thickness of the individual sections in the general area.

# Stratigraphy:

Lower Cretaceous:

Sandstone, conglomerate,

siltstone, silty shales

# Vancouver Group:

(Upper Triassic and (?) Jurassic)

Bonanza Sub-group:

andesitic flows and breccia, felsite tuff, greywacke, shale, argillaceous and calcareous shales, argillaceous

limestone.

(Upper Triassic)

Quatsino Formation:

limestone

Karmutsen Formation:

massive and amygdaloidal volcanic flows, breccia, pillow lava, tuff of andesitic and basaltic composition

thin limestone beds.

(Late Jurassic or Tertiary (?))

Intrusive rocks:

quartz diorite, andesite dykes or

sills.

# Local Geology:

Geological mapping was conducted on a scale of 1" = 400 feet over the western section of the claim group. A grid established on the claims during the 1968 field season was used to obtain ground control.

Outcrop is nearly exclusively confined to creek beds or steep hillsides and consists of thin narrow strips or isolated occurrences, the outcrop pattern did not change in general, except additional outcrops were mapped in the western and southeastern part of the property.

Rock specimens were collected in the field and investigated in the office with a petrographic microscope. Rocks were subdivided by composition and alteration, however, special care was taken to place the different rock units within the correct stratigraphic horizon.

Strong northwesterly trending faults render the outcrop pattern of the different rock units highly complex.

# Discussion of Local Geology:

Stratigraphy:

Late Jurassic to Tertiary (?) Intrusive Rocks:

Quartz Diorite: In the southwestern part of the gridded area several small outcrops consisting of coarse grained quartz diorite occur surrounded by andesites, strongly silicified sediments of the lower Bonanza Sub-group and Quatsino limestones. No exposed contacts between the intrusive and sediments have been observed in the field, but the strong silicification, pyritization and agilitic (?) alteration of the Bonanza Sub-group is similar to other occurences where definite intrusive evidence exists. A skarn float with sphalerite, galena and contact metamorphic minerals indicated a thermal intrusive relationship.

A larger stock of quartz diorite intrudes the Karmutsen volcanic rocks in the eastern half of the claim group. This intrusion appears to belong to the same mass outcropping to the north and west of Nahwitti Lake. The contact between the Karmutsen Volcanic and the intrusive is strongly silicified, and gradational over a narrow width. Minor pyrite and chalcopyrite have been found in this area along the contact.

Andesitic dykes and/or sills? In the southwestern section of the claim group, a series of andesitic to dacitic sills are interbedded with the upper part of the Quatsino limestone and the lower part of the Bonanza sediments.

Although no definite intrusive relationship has been observed, areas mapped to the west and east of the Ti claims show the andesitic sills are not continuous, of irregular width, and cut the sediments at an angle varying between 5°-15°, also where the andesitic bands have been observed, sudden changes in dip and strike occurs in the overlaying sediments.

No direct age relationship has been observed between the quartz diorite and the andesitic bands, but they appear closely related.

Upper Triassic and (?) Jurassic, Bonanza Sub-group: The Lower Bonanza sediments outcrop in the southern and western section of the mapped area. They are well banded and strongly silicified, banding where observed, has variable at titude over short distances in the preximity of the andesitic sills, and are uniform N45W, 30° SW where not deformed.

A zone of rhyolitic appearing rocks overlay the Quatsino limestone in the extreme west, and similar appearing outcrops occur within the banded sediments. In both places pyritization is present.

A similar rock type was mapped to the west of this claim group in the vicinity of acidic intrusives and faults. At this locality a gradational change from rhyolitic-appearing rocks to Bonanza volcanics or sediments has been observed. There is a good indication that this rhyolitic appearance is due to strong alteration (silicification and pyritization).

Upper Triassic - Quatsino Limestone: The central part of the mapped area is underlain by a northwesterly trending belt of limestone. The limestone, where outcropping, is greyish to black and identical to the upper part of the Quatsino formation. Outcrops are sparse, but solution and collapse features mark the surface trace of this formation.

Skarnitized limestone float carrying sphalerite, galena and chalcopyrite has been found in the vicinity of the limestone intrusive contact. Attitude of the limestone is N45°W. 40NE.

Triassic-Karmutsen Formation: The northeastern section is underlain by a thick sequence consisting of interbedded andesites, amygdaloidal andesites and basalts representing the upper section of the Karmutsen formation. The rocks have a fairly fresh appearance, are dark to light green to black in color and fine grained. Amygdaloidal filling consists of quartz, calcite and occasionally minor chalcopyrite.

Along the contact with the intrusive strong silicification and minor pyrite is present.

# STRUCTURE

The structural setting as indicated by attitudes and outcrop pattern is quite complex and not understood.

The presence of intrusive rocks in different parts of the property, andesitic sills (?) cutting the sedimentary units obliquely at a small angle, combined with small and limited rock exposure make the tracing of the individual units difficult.

A strong west-northwest trending fault traverses the central part of the map area and offsets the different units.

Several lineations are evident on air photographs, but have not been definitely identified on the ground.

### **MINERALIZATION**

Tusfaceous and rhyolitic (?) float has been found carrying minor chalcopyrite.

A pyrite-rich quartz diorite float returned . 1% copper. Skarn boulders, bearing sphalerite and minor galena have been found in the vicinity of the limestone-intrusive contact.

# GEOCHEMICAL SURVEY

The curvey consisted of extending the reconnaisceance soil sampling westerly along the grid established during November 1968, along lines 400 feet apart and 200 foot stations, and detail sampling of anomalous copper areas outlined by earlier work consisting of establishing lines 200 feet apart and 100 foot stations. All samples were analyzed for zinc and copper.

Procedure: Soil samples were collected along lines 400 feet apart and 200 foot stations, reconnaissance spacing, or along lines 200 feet apart and 100 foot stations, detail spacing, by means of an auger. Care was taken to sample the oxidized layer immediately below the humus layer (B horizon) At each site notes were recorded regarding soil type, topography, sample depth and vegetation to facilitate the interpretation of the results.

Samples were packed in kraft envelopes and forwarded to Chemex Labs Ltd North Vancouver. There the samples were dried, screened to -80 mesh and tested for copper and zinc by the atomic absorption method.

Interpretation of Results: The background for copper and zinc was established by statistical analysis. The copper values were grouped at 10 parts per million (ppm) the zinc values at 20 parts per million (ppm) intervals, percent frequency and accumulated percent frequency were calculated and plotted on arithmetic probability paper. From the plotted data the range of background, mixed zone, and anomalous zone was read.

#### COPPER

Background:

343 samples

leso 30 ppm

Mixed Zone:

308 samples

30 ppm to 70 ppm

Anomalous Zone:

83 samples

greater than 70 ppm

#### ZINC

Background:

298 samples

less 60 ppm

Mixed Zone:

126 samples

60 ppm to 140 ppm greater than 140 ppm

Anomalous Zone:

41 samples

# RECONNAISSANCE SURVEY

A total of approximately 7 miles was sampled along 400 foot lines and 200 foot stations.

### RESULTS

# a) Copper:

No anomalous zones have been indicated by this survey, although three isolated samples are above 70 ppm.

# b) Zinc:

Four anomalous zones, trending northerly have been outlined by this survey.

Zone 1 - this zone trends northeasterly from line 8N, 40W to line 20N, 34W and is still open. A maximum width of approximately 400 feet and a length of 1200 feet is indicated. Peak value within this zone is 2850 parts per million zinc at 20N, 36W. Copper value at this station is 136 parts per million.

Zone 2 - this anomalous zone is centered on line 8N, 48W. It is not as well defined as Zone 1, but has an overall length of 1200 feet, from 4N, 50W to 16N, 50W. Peak value is 1600 parts per million. Copper values at this station is 91 parts per million.

Zone 3 - a few isolated, irregularly spaced samples above 150 parts per million are located along line 8S, 38W to 4S, 42W.

Zone 4 - on line 4N, 62W, the western boundary of the gridded area, 2 anomalous values were obtained, but are open to the west.

### DETAIL SURVEY

A reconnaissance geochemical survey, conducted during November, 1968, outlined five copper anomalies. A total of 6 line miles have been detailed.

# COPPER

Zone 1 - this zone consists of two distinct areas trending from 12N 12W to 16N, 12W, and 14N, 16W to 16N 20W and is open. Peak value is 136 ppm, 2 1/2 times background.

Geological mapping shows that this zone is underlain by granitic intruction in contact with limestone. A pyrite rich granitic sample from this area was assayed and returned . 1% copper and 0. 15 ozs Ag.

Zone 2 - this zone is centered at 18N, 10W and extends from 14N 10W to 20N, 8W. Peak value is 138 parts per million at 20N, 8W. The zone is open to the east.

Geological mapping indicates the presence of gramitic intrusions within the general area.

Several other areas of low anomalous values are present, but too irregular. In every case a limestone-volcanic contact or limestone-intrusive contact is indicated in the general area.

#### ZINC

The detail geochemical survey outlined three anomalous areas.

Zone 1 - this zone is indicated along line 0+00, 18W to 12W and consists of a series of values above 150 parts per million. The anomaly is open to the south.

Zone 2 - along line 4N, 20W to 18W a zone of high zinc values is indicated. This zone is a possible extension of Zone 1, but since no samples are available south and west of this area, the extent of this zone is unknown.

Zone 3 - well defined zinc high lies between lines 8N, 16W to 12N 17W. Peak values obtained is 690 parts per million.

This zinc high is underlain by a limestone-intrusive contact and partially overlaps the eastern part of copper anomaly 1.

# CONCLUSIONS

- 1. The detailed geochemical survey outlined one anomalous zone high in copper.
- 2. Detailed geological mapping shows a limestone intrusive contact in this area.
- Zinc anomalies outlined by detailed sampling, and indicated by reconnaiseance campling are in general associated with limestone. or limestone intrusive contacts.
- 4. Copper and zinc floats have been reported from the anomalous area.
- 5. The reconnaiscance geochemical survey did not outline any anomalous zone for copper, although several isolated low anomalous values are present.
- 6. The results for zinc shows three strongly anomalous zones, coinciding with the isolated high copper values.
- 7. This zinc anomalous appears to be absociated with contact zones, i.e. limestone-intrusive or limestone-volcanics.

#### RECOMMENDATION

- 1. Detailed geological mapping over the remainder of the property.
- 2. Detailed geochemical sampling of reconnaideance zinc anomaly.
- 3. Detailed magnetometer survey with MF1 Fluxgate to follow and outline the extent of the intrusive.
- 4. Trenching or drilling of anomalous zones
- 5. Pac each drilling of detailed copper and zinc anomaly.

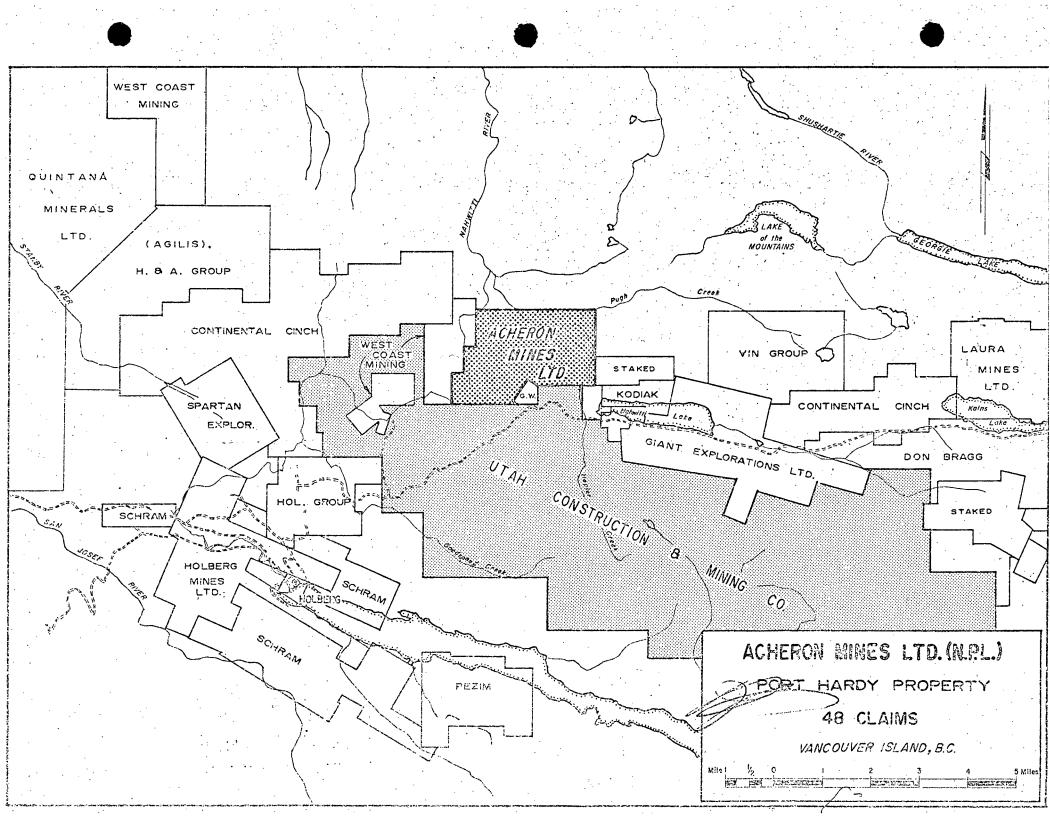
Respectfully submitted,

F. Holcapek, Geologist

I. Hokepeh

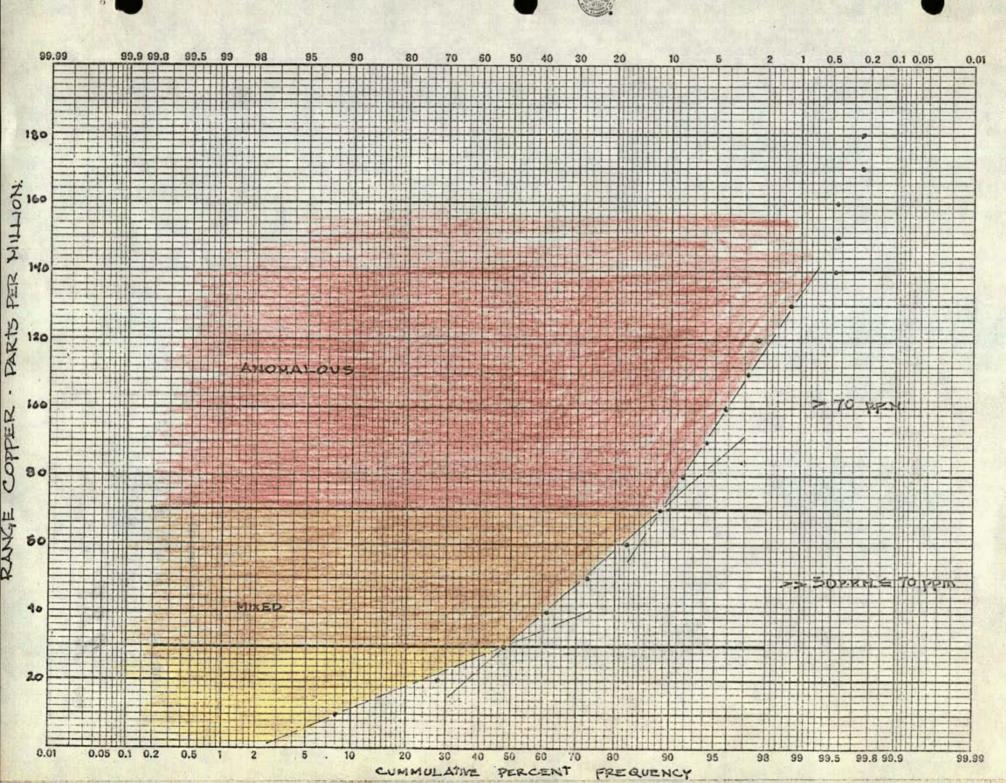
Endorsed by:

R. H. D. Philp, F. Eng.,



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NO. 2286 MAP

# DOMINION OF CANADA:

PROVINCE OF BRITISH COLUMBIA.

To Wir:

In the Matter of the geochemical surveys over the Nah and Ti Groups, Nanaimo M. D.

# RONALD PHILP

of 201-714 West Hastings Street, Vancouver 1, B. C.

in the Province of British Columbia, do solemnly declare that the following personnel were employed and costs incurred in conducting the surveys during the periods November 4-24, December 15-19, 1969.

# PERSONNEL

F. Holcapek (geologist) - field supervision 3+5 = 8 days		
at \$80/day	640.00	
" Office $3/4 \times 80 + (4)$	320.00	•
R. Philp - Office supervision, report 1day at \$100/day	100.00	
P. Van Riesen - labour - 20 days @ \$31/day	620.00	
J. Young - party chief - 20 days @ \$34/day	680.00	
R. Branch - labor - 6 days @ \$34/day	204.00	
A. Leatherdale - labour - 6 days @ \$34/day	204.00	
B. Bartley - labour - 5days @ \$34/day	170.00	
S. Lewis - labour - 5 days @ \$34/day	170.00	
L. Marsh - plotting and drafting $20 + 20 = 40 \times $5.00/hr$	200.00	\$3 308.00
DISBURSEMENTS:		•
Meals and accommodation 70 man days @ \$8/day	560.00	
Truck rental 25 days @ \$20/day	500.00	
Geochemical testing 529.38 + 39.78	569.16	
Miscellaneous, freight, printing, typing etc., Supplies, equipment	29.13 244.41	\$1,902.70
		\$5,210.70
		and the state of t

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

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Province of British Columbia, this

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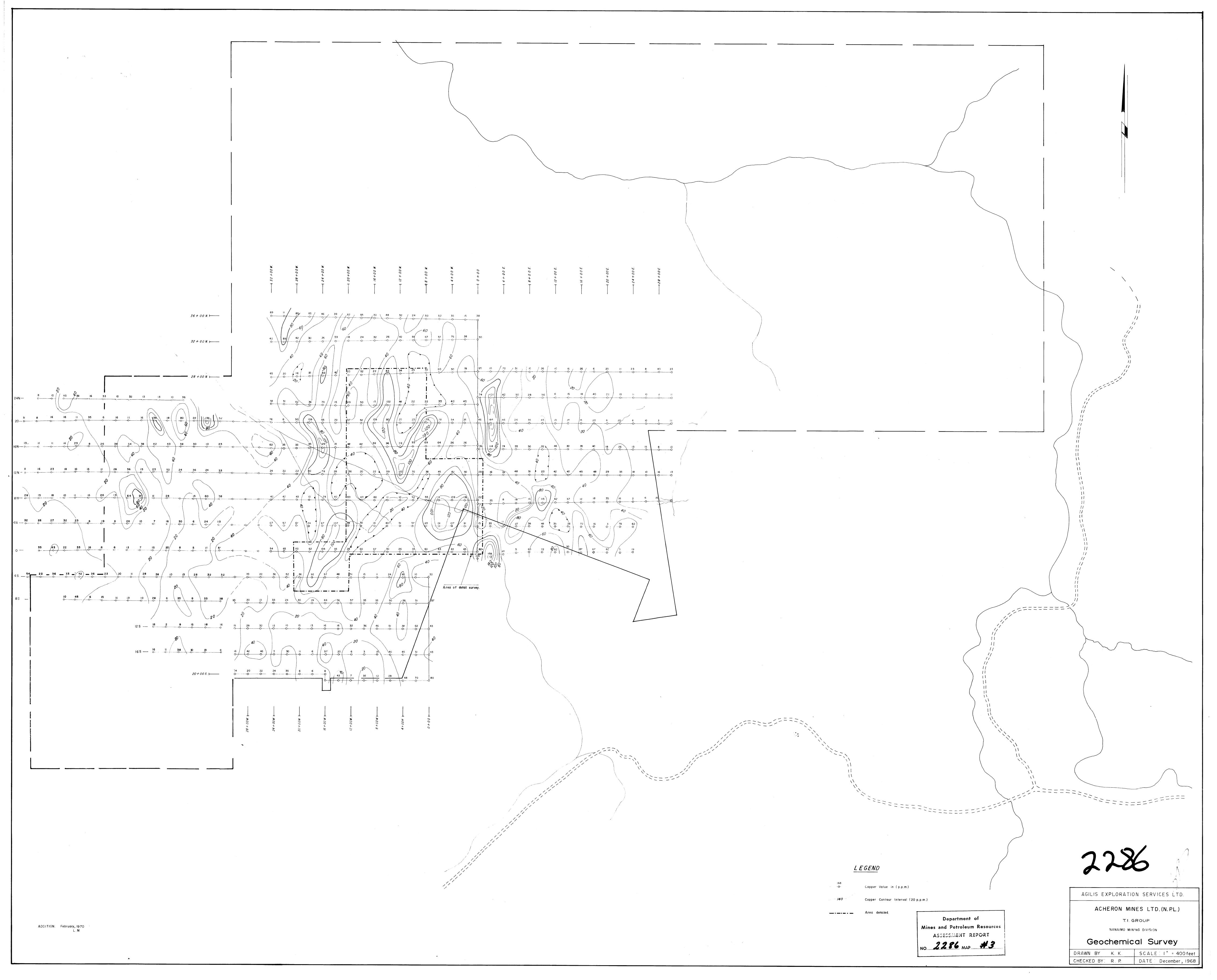
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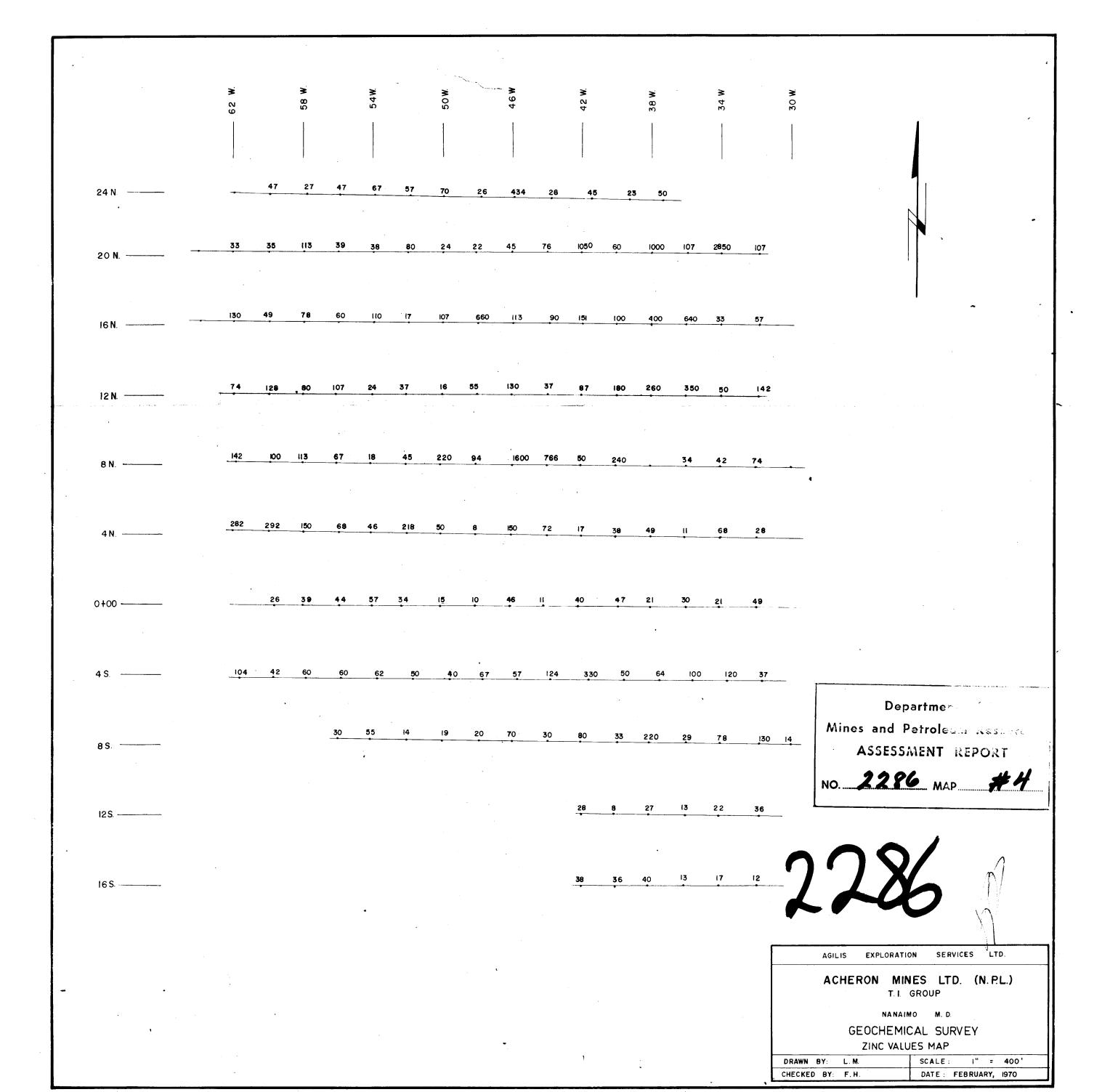
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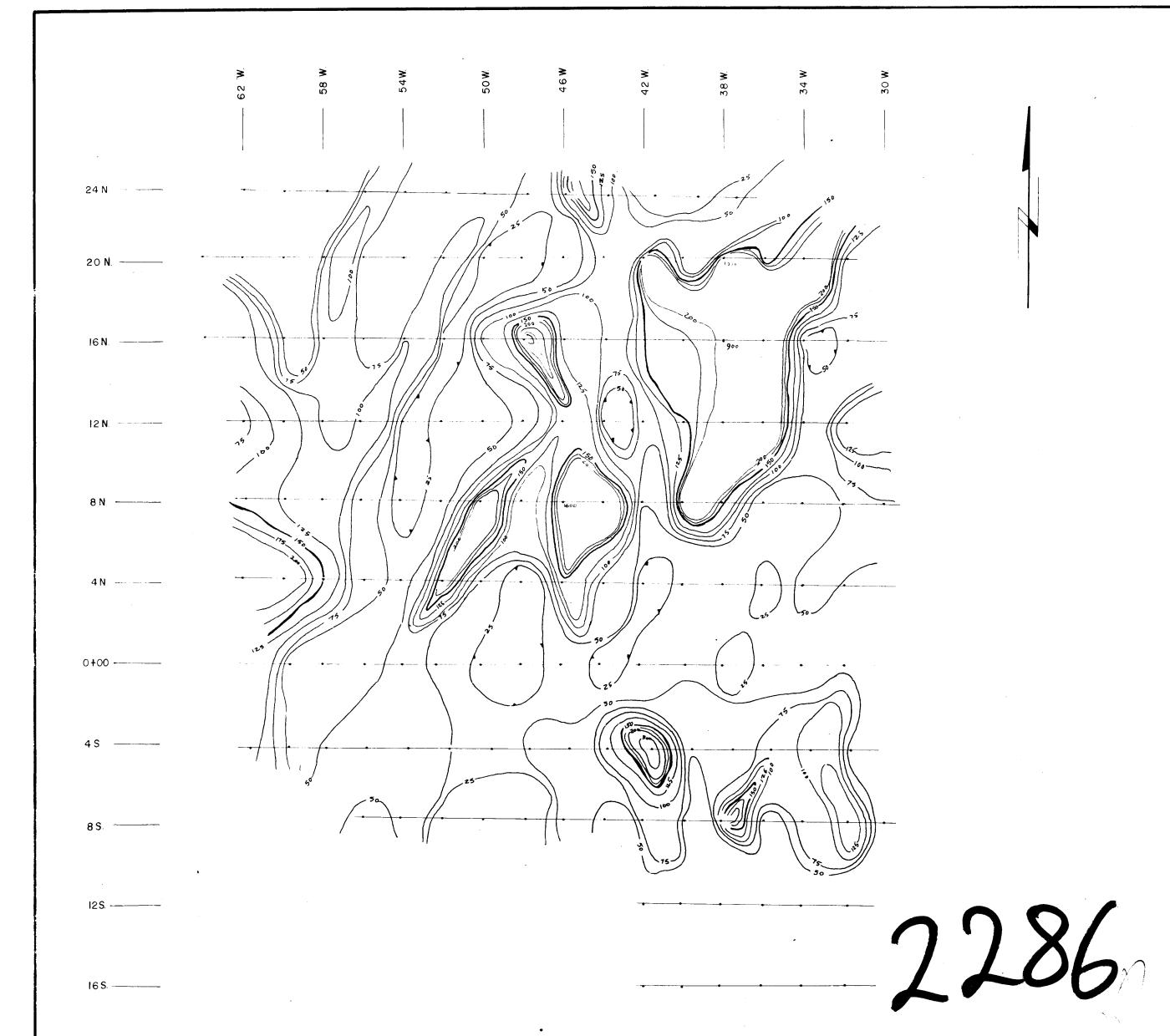
A Commissioner for taking Affidavits for British Columbia of A Notary Bublic in and for the Province of British Columbia.

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SUB-MINING RECORDER







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NO. 2286 MAP #5

LEGEND

\_\_\_\_\_\_\_\_ ZINC CONTOUR (interval - 25 ppm)

AGILIS EXPLORATION SERVICES LTD.

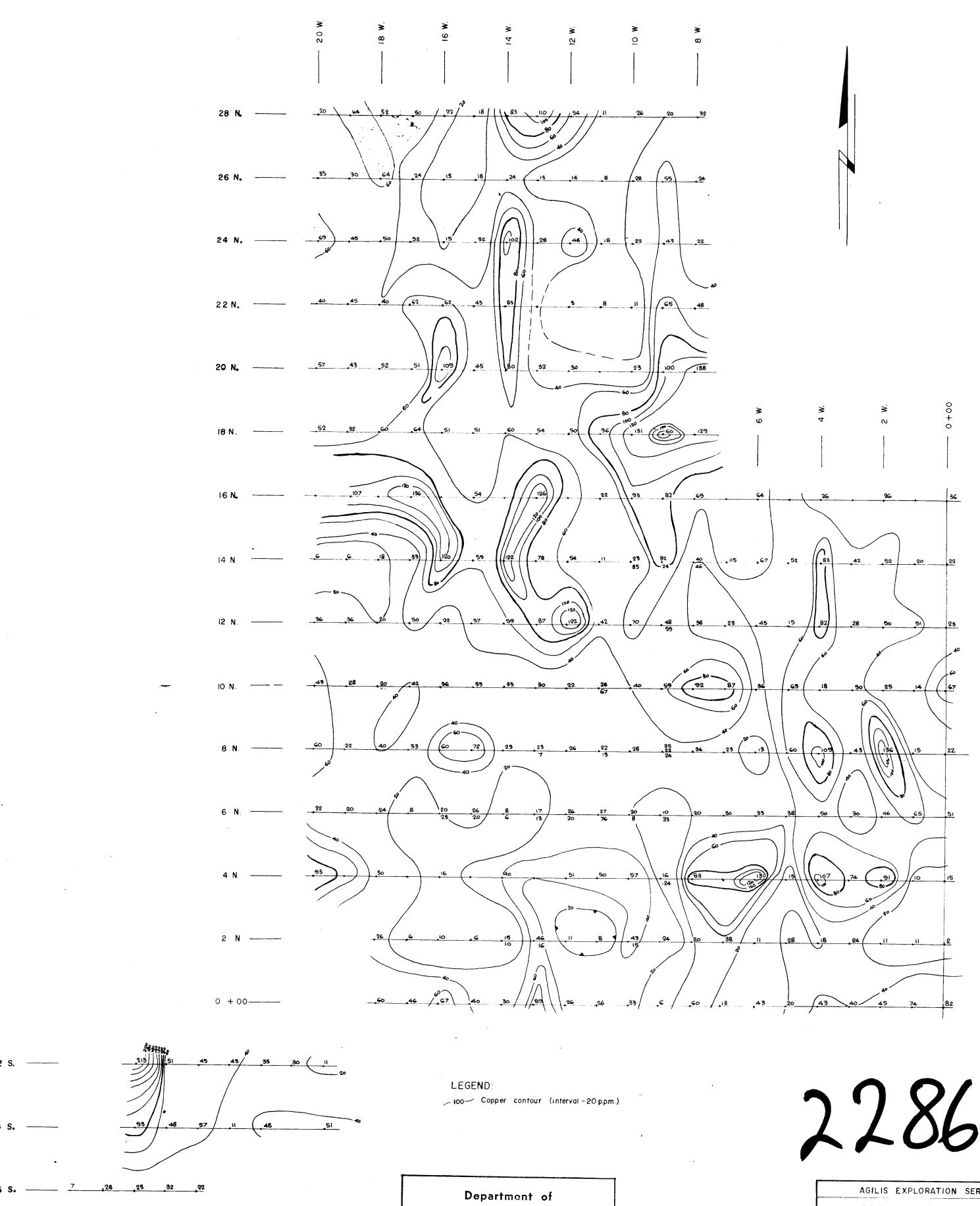
ACHERON MINES LTD. (N.P.L.)
T.I. GROUP

NANAIMO M. D

GEOCHEMICAL SURVEY
ZINC CONTOUR MAP

DRAWN BY: L.M. SCALE: I" = 400'

CHECKED BY: F.H. DATE: FEBRUARY, 1970



Mines and Petroleum Resources

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NO. 2286 MAP #6

AGILIS EXPLORATION SERVICES LTD.

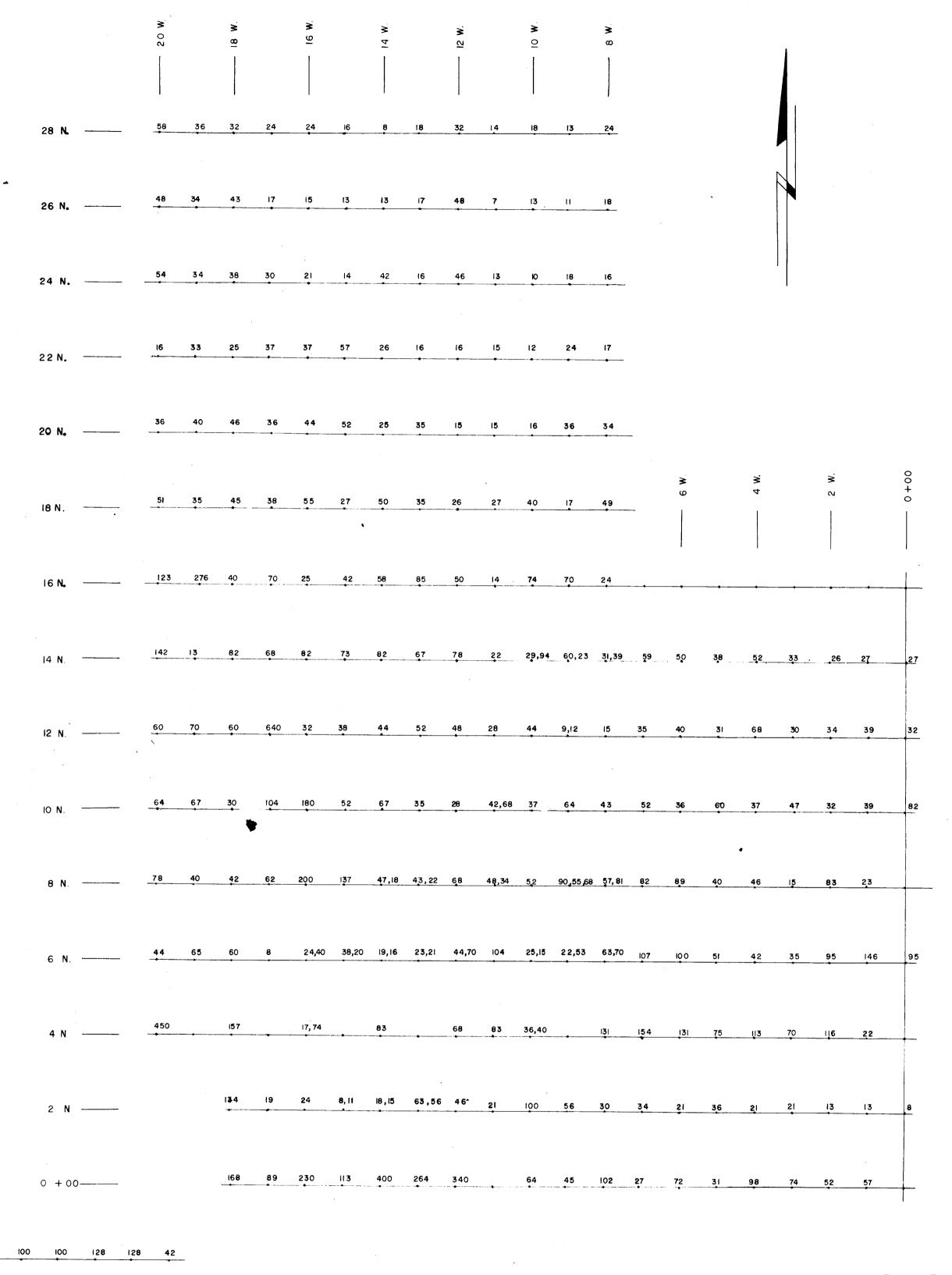
ACHERON MINES LTD. (N.P.L.)

TI GROUP NANAIMO M.D.

DETAILED GEOCHEMICAL SURVEY

copper

DRAWN BY: L.M. SCALE: 1" = 200' CHECKED BY: F.H. DATE: FEBRUARY, 1970



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NO. 2286 MAP #7

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ACHERON MINES LTD. (N.P.L.)
TI GROUP

NANAIMO M.D.

DETAILED GEOCHEMICAL SURVEY ... ZINC VALUES MAP

DRAWN BY: L.M. SCALE: I" = 200'

CHECKED BY: F.H. DATE: FEBRUARY, 1970

