1089

REPORT

AIRBORNE GEOPHYSICAL SURVEY

and

PRELIMINARY GEOCHEMICAL SURVEY

over the

TOE #1 - #23 CLAIM BLOCK

in the vicinity of

BOOT LAKE, UPPER QUILCHENA CREEK AREA

NICOLA MINING DIVISION, B. C.

49°, 120°, S.E.

October 15, 1967

by

W. M. SHARP, P. ENG., CONSULTING GEOLOGICAL ENGINEER

for

CONSOLIDATED SKEENA MINES LTD., (N.P.L.)

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#G-2, Radioactivity; Scale 1" = 1000' #6
#G-3, Electromagnetic; Scale 1" = 1000' #5
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INTRODUCTION

The exploration of the basic Toe #1 - #23 claim block is integral with that of the Company's general Toe group, and coordinated with that of the westerly-situated area covered by the Echo, N.E. Echo, Chalcocite - Malochite, and HN - WEN claim groups.

The preliminary, or reconnaissance geological-geochemical phases of the scheduled total program are about three-fourths completed. Reconnaissance work on the Toe #1 - #23 block was carried out, intermittently, during October-December, 1966 and June - July, 1967.

The combined data accruing from the airborne geophysical survey, preliminary geochemical survey, and geological reconnaissance have indicated a large area of probable and potential bedrock low-grade copper mineralization traversing the Toe #1 - #23 claim block, with general easterly extensions into the subsequently-staked N.E. Toe block. This will be further delimited by detailed soil-sampling, magnetometer surveys, and possibly localized I.P. checks prior to commencing physical exploration by trenching and/or core or percussion-drilling.

The geochemical-geological sections of this report are based largely on data accruing from J.E. White's field work and observations; those being supplemented by the writer's notes accruing from his own field examinations and office studies of previous and concurrent local explorations, and of the general geological literature. It also includes data from Messrs. A. & G. Boettger's preliminary geochemical investigations of the Echo and Toe claims, performed during July - October, 1966 - subject to subsequent field checks by Mr. White.

PROPERTY

(a) Location and Access:

These details, as well as the outline of the area covered by the air-borne geophysical survey are shown on the accompanying 1 inch = 2 mile index map. Individual claims comprising the Toe #1 - #23 block are shown on the following 1" = 1000' report map and Drawing #2-A in the map pocket.

The Toe claim group lies about 9 miles due east of the village of Aspen Grove; locally it abuts the south end of Boot Lake.

Local access is by way of some 14 miles of main logging-forest access road, branch roads, and trails; 4-wheel drive vehicles are normally required during the general wet, to snowy winter season.

The local terrain is moderately level to slightly hilly, covered by small timber with little underbrush. Bedrock is rather uniformly covered by moderate depths of drift; however, outcrops are frequent enough for a general delineation of the underlying intrusives and volcanics.

(b) Claims

The original group was staked by Albert Boettger for Consolidated Skeena Mines Ltd. (N.P.L.) during the first two weeks of October, 1966. They were recorded at Merritt, B.C. on October 18, 1966. Record numbers corresponding to Toe #1 to #23 M.C's., inclusive are 32702 to 32724. On the basis of the preliminary geochemical indications and airborne geophysical survey data gained during subsequent exploration, the group was expanded by additional staking during June and July, 1967. The property is situated within the Nicola Mining Division.

SUMMARY OF EXPLORATION EXPENSE, TOE #1 - #23 M.C. 's

(A) GEOCHEMICAL INVESTIGATION:

1966 Soil Sampling,	
J. White, Oct. 20, 21, Nov. 24, 25, 1966 - 4 @ $30.00	$ 120.00
G. Boettger, Oct. 20, 21, Nov. 24, 1966 - 3 @ $20.00	60.00
Field geological consultation, Nov. 25, 1966 - 1 @ $100.00	100.00
Truck rental and operation; 5 days @ $10.00	50.00
Motel, G. Boettger; Oct. 20 - 31, 1966, 12 days @ $5.00	60.00
Sample bags, estimate total 200 @ 3¢	6.00
Rubeanic field test materials, 100 @ 10¢ each	10.00
Bio Metals Corp., sample prep. and CU analyses, 101 @ $1.20	121.20
1967 Soil Sampling,	
J. White, July 3 days @ $30.00	90.00
G. Mason, July 3 days @ $20.00	60.00
Camp and truck 3 days @ $10.00	30.00
Barringer Research Ltd., Aug. 1967; 27 CU-Mo @ $3.50	94.50
20 HG @ $2.00	40.00
Sub-Total, Direct Expense	$ 841.70

(B) AIRBORNE GEOPHYSICAL SURVEY

Waterton Aeronautics and Explorations Ltd., May 13, 1967	$3,650.00

(C) GEOLOGICAL SUPERVISION, field map compilations, and report preparation, W.M. Sharp, P.Eng., June 5-8; October 12-15, 1967; 5 office days @ $50.00 $ 250.00

Total, geological, geochemical and geophysical $4,741.70

W. M. Sharp

GEOLOGY

This is broadly illustrated by the report Index Map.

The Echo claim group is situated on the contact of the Pennask granodiorite body and the Nicola volcanic group. Regionally the latter occupies a prominent east-west trending embayment between the larger Princeton, and smaller Pennask granodiorite bodies to the south and north, respectively.

Within some areas of the embayment Nicola volcanics and sediments have been strongly warped and sheared along axes which are noteably divergent or transverse to their usual northerly trends in the region. Such "cross-panels" appear to form optimum structural settings for the district CU-MO mineralization. Such structurally-anomalous trends, involving both the older Nicola volcanics, the local Pennask intrusives, plus "dioritized" panels and inclusions of the former, are conspicuous within the Brenda Lake area; the occurrence of transverse fracturing, shearing, and veining is a conspicuous structural feature of the upper Siwash Creek Au-Ag-Pb-Zn mineralization.

Locally, the Pennask granite-Nicola contact strikes southwesterly across the westerly Toe claims; in addition it appears, from recent observations, that the intrusive bulges conspicuously in this area. The intersection of this with the inferred Wart fracture lineament may provide a focus for the development of significant fracturing.

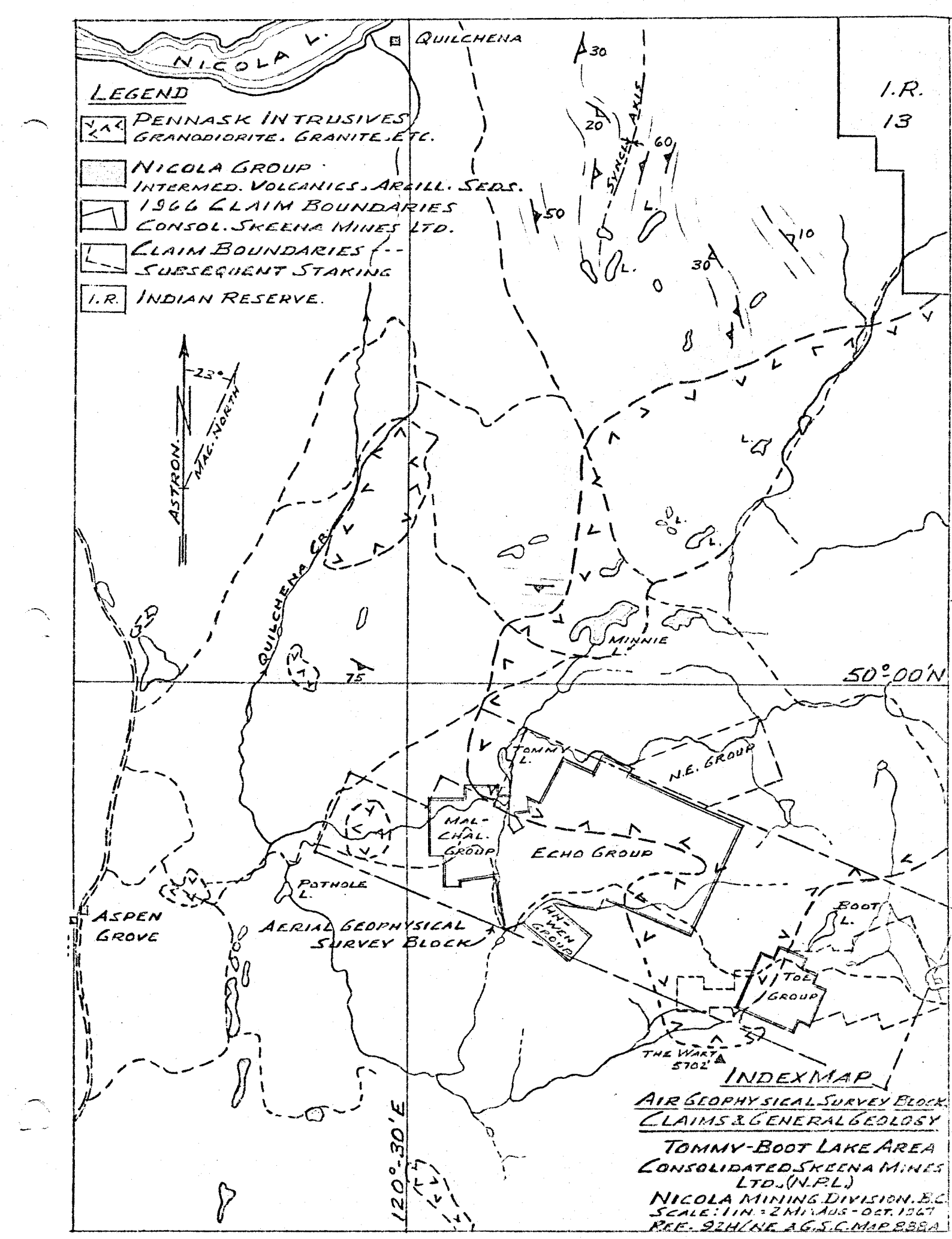
To the east of the above contact the andesitic tuffs are locally dioritized and/or intruded by small diorite bodies. Trace-occurrences of magnetite-chalcopyrite mineralization have been observed within these altered, dioritic areas. Although several minor fracture-filling occurrences of copper mineralization occur within both volcanic and intrusive rocks of the westerly-situated Echo claim group, these are not associated with zones of significant wall rock alteration and intrusion that characterize the potential Toe areas. In addition, the latter are associated with a generally weak, but extensive geochemical (CU) anomaly, and areally related to a larger sub-parallel positive magnetic anomaly delineated via the air-borne geophysical survey.

GEOCHEMICAL RECONNAISSANCE

1. General:

The following text is supplemented by the accompanying 1" = 1000' map, "Preliminary Geochemical Survey, Toe Group, Boot Lake Area".

Within the Toe #1 - #23 claims area reconnaissance soil-sampling was conducted along the Forest Access Road, claim location lines, and a central, transverse claim boundary line. Additional reconnaissance sampling, on a


NICOLA L.
QUILCHENA
LEGEND
PENNASK INTRUSIVES GRANODIORITE. GRANITE. ETC.
NICOLA GROUP INTERMED. VOLCANICS. ARGILL. SEDS.
1966 CLAIM BOUNDARIES CONSOL. SKEENA MINES LTD.
CLAIM BOUNDARIES -- SUBSEQUENT STAKING
I.R. INDIAN RESERVE.
I.R. 13
SYNCL. AXIS
ASTRON. MAG. NORTH
23°
QUILCHENA CR.
MINNIE L.
50°00'N
TOMMY L.
N.E. GROUP
MAL-CHAL. GROUP
ECHO GROUP
POTHOLE L.
ASPEN GROVE
AERIAL GEOPHYSICAL SURVEY BLOCK
HI-WEN GROUP
BOOT L.
TOE GROUP
THE WART 5702'
120°30'E
INDEX MAP
AIR GEOPHYSICAL SURVEY BLOCK
CLAIMS & GENERAL GEOLOGY
TOMMY-BOOT LAKE AREA
CONSOLIDATED SKEENA MINES LTD. (N.P.L.)
NICOLA MINING DIVISION. B.C.
SCALE: 1 IN. = 2 MI. AUG. - OCT. 1967
REF. 92H/NE A.G.S.C. MAP 888A

750' x 750' grid pattern similar to that on the easterly, and westerly-adjoining Toe claims, is yet to be completed. As noted earlier in the report, the Toe #1 - #23 area is generally blanketed by variable, but apparently moderate depths of glacial drift; within the surface soil layers the "B" soil horizon is characteristically well developed.

2. Soil-Sampling and Analytical Procedures:

The normal soil-sampling procedures were demonstrated to the field crew prior to starting initial reconnaissance work on the Company's property in the summer of 1966.

Initially, only the "B" horizon was sampled (CU detection) via 6" - 12" deep pits excavated by means of a standard prospect pick (combination pick-axe, or axe and mattock). During 1967 the "B" samples were augmented by a "C"-zone sample at each station, where stipulated, for mercury halo detection; therefore, sampling to depths up to 3 feet was necessary.

During 1966, the analysis of B-zone samples comprised a preliminary field test for cold-soluble copper, using the standard rubeanic spot-test, supplemented by laboratory testing for parts per million (p.p.m.) of hot acid-soluble (total) copper - the determinations being carried out by the atomic-absorption method. Approximately 300, or about one-half of the samples taken were analyzed at Bio Metals Corp., North Vancouver Laboratory. Subsequent comparisons of the rubeanic and A.A. results failed to show any significant correspondences; moreover, several negative rubeanics were shown to contain anomalous concentrations of copper in relatively insoluble form. In addition, groups, or occasional samples were laboratory-tested for total Mo.

With the additional requirement of testing for mercury during 1967, as well as copper and molybdenum, all samples were sent to the Barringer Research laboratory near Toronto. These included separate "B"-zone and "C"-zone samples, with the additional requirement that the latter be dried at relatively lower temperatures (under 100 degrees Fahr.) in order not to volatilize any Hg present prior to the laboratory analysis. Consequently, all samples were sun-dried and sieved through 80 mesh nylon screen prior to shipping to Barringer's Vancouver receiving depot. Originally, all of these were field-tested by the rubeanic method, but this has been temporarily discontinued for reasons of general expediency.

In addition to determining total CU and Mo by the A.A. method, Barringer is able to detect trace amounts of Hg by means of specially developed equipment. This equipment and technique partially overcomes the masking effects, or false anomalies caused by organic contaminants in some samples. Mercury is determined in parts-per-billion (p.p.b.) of soil sample by measuring the degree of absorption of the 2537 A^{0} mercury - emission line on passing through the heated sample vapour; the specific multi-channel equipment permits a determination of mercury content in the presence of organic material.

For reconnaissance purposes, for which only moderate selectivity is required, or even safe, the total metal results are evaluated as:

Background	@	0-trace rubeanic 5 max.	; 0 - 19 p.p.m. total CU
Threshold	@	1 rubeanic 5 max.	; 20 - 30 p.p.m. total CU
Anomalous	@	2 - 5 rubeanic 5 max.	; 40 plus p.p.m. total CU

Significant Mo @ 3 - plus p.p.m.

Anomalous Hg @ 10 - plus p.p.b.

3. Results and Interpretations

Interim results and interpretations of this and other data have indicated where additional staking and/or geochemical reconnaissance work is necessary. The following are interpretations of the accumulated data:

A distinct copper anomaly occupies the central, easterly part of the claim block; it extends for some two claim lengths east-northeast of the east boundary of this area. The extensions of this, plus sporadically anomalous areas to the north and south have been covered by additional stakings. From geochemical data at hand, it appears that this anomaly (and possible zone of mineralization) occurs entirely within the Nicola rocks, on a trend which is about normal to that of the local granite - volcanic contact. The general, or composite anomaly has an apparent width of between 700 and 1800 feet. Over this area total CU concentrations range from 20 to a local "high" of 140 p.p.m.; the average, excluding "threshold" occurrences, being about 60 p.p.m. The local geochemical "background" averages about 12 p.p.m. Within the anomaly and along the "0" base-line the correspondic rubeanic values range from 1 to 3 on this scale.

The indicated occurrence of anomalous concentrations of Hg in fringe relationship to easterly part of the copper anomaly suggests the presence of an Hg halo. Although the rather widely-spread pattern of the individual occurrences does not permit conclusive interpretations, the general distribution of these with respect to the CU anomaly suggests a hydrothermal halo relationship and, therefore, some degree of probability that the copper anomaly is related to actual occurrences of copper mineralization within the underlying bedrock.

Extended reconnaissance soil sampling has partly indicated other CU-anomalous areas within the expanded Toe claim group.

AIRBORNE GEOPHYSICAL SURVEY

Preliminary Remarks

This was performed by Waterton Aeronautics and Explorations Ltd. on May 13, 1967. Drawing G-1 and over-lay Dwgs. G-2, G-3, and G-4 contain C. Waterton's plots of the radioactivity, electromagnetic, and magnetic data recorded by the combined instrument package. The area tested by this survey is shown on the Index Map prefacing this report. The sequence of individual flight lines, with transcriptions of the film-recorded data on them, are compiled on Dwg. G-1.

Dwg. G-2 is a straight plot of the radioactivity data; the relative strength of the various flight readings is represented by the size of the circles shown. The radioactivity readings plotted on G-1 are in units of 0.005 MR/hr (Milli-Roentgens per hour).

Dwg. G-3 represents a simple reading-to-reading correlation of the electromagnetic data by Waterton Aeronautics. This does not consider possible geological influences or controls. The individual instrument readings plotted on Dwg. G-1 represent the relative degrees of electromagnetic response.

Dwg. G-4 also represents a simple correlation of the magnetic data, with the resulting anomalies being unrelated to possible geological influences. The basic data plotted on Dwg. G-1 are in units of 100 gammas.

Dwg. #2-A contains the writer's interpretation of the geophysical data. This considers the probable effect of local geological features, which includes contact and structural trends; the relative conductivity (re E.M. data) of the adjoining granitic and volcanic - sedimentary (locally carbonaceous-graphitic) rocks; the normal differences of magnetic attraction, or effect exhibited by the above rock assemblages; and the normally-greater radioactivity associated with granitic, rather than with sedimentary-volcanic rock types - excluding the possible effect of concentrations - however unlikely - of uranium minerals within the latter rock types. Drawing #2-A combines general geological features, geochemical anomalies, and the writer's general correlations of the geophysical data on one plan; this plan serves as a general over-lay with respect to the "G" series of plans.

2. Aircraft, Instrumentation, and Methods

The aircraft used is a Piper 235 Cherokee single-engine monoplane. The test area was flown via level, parallel lines spaced 500 feet apart, at an altitude of about 500 feet over the highest point of ground along the line. Station-keeping was accomplished by flying between two topo-ref. lines drawn on a 1:50,000 scale map. A directional gyro, set to true heading by astro compass, was also used. Waterton Aeronautics state that ground checks from over 20 areas have found the accuracy of the method to be between 250 and 500 feet on a 500 foot grid.

Instrumentation:

This detail is taken from the Company's brochure "Waterton Airborne Geophysical Reconnaissance":

(a) Fluxgate Magnetometer: PMF-3 Sharpe, adjusted to return to "0" rapidly enough for the speed of the aircraft; readings in units of 100 gammas.

(b) Nucleometer: Detectron - DR 229, 24 tubes; readings are in units of .005 MR/HR.

(c) Electromagnetic: A 55 foot cable is attached to the bottom of the aircraft. A small 10 oz. "bird" is powered by its own mercury cell. A magnetic field (from a 3500 watt A.C. source) is transmitted at 1000 c.p.s. by the cable, and the receiver is tuned to "0". The receiver coil is set at 90° to the transmitted field and, being very sensitive, only 30% of its receiving power is used. This signal is transmitted, at 1000X amplification, to a second receiver inside the aircraft. The equipment indicates the presence of metallic sulphides and/or other geological conductors.

Geological-Geophysical Interpretations (Dwg. 2-A)

(a) Radioactivity: This is inferred to be due to the presence of a variety of K-Feldspar; this may be a normal primary constituent of the local granite, or related to younger pegmatitic differentiates and/or hydrothermal agencies. The major occurrences of radioactivity follow a general zone sub-parallel to the general granite-volcanic contact. With respect to the Toe #1 - #23 claims, the principal occurrences of radioactivity lie closely west and south of the claim block. These may, or may not be indicators of pegmatitic-hydrothermal zones of mineralization; however their spatial relationship to the major magnetic anomaly and indicated geochemical anomaly may be significant. In any case, a general ground-check by scintillometer would be necessary before making specific geological inferences of the importance of the currently indicated radioactive areas.

(b) Electromagnetic Anomalies: These anomalies appear to be most generally associated with the Nicola rocks, and also appear to occur on trends more-or-less parallel to the granite-volcanic contact. In this context they probably indicate the relatively more conducting transversely - trending bedding sections, or zones of similarly-trending graphitic shears. Within the general Toe claims area they may be related to zones of disseminated pyrite, etc. occurring in fairly close proximity to the local magnetic-geochemical anomaly. As such, the mineral could represent metasomatic reconstitutions of iron and sulphur or, perhaps, be of hydrothermal origin.

(c) Magnetic Anomalies: The principal + anomalies lie within Nicola rocks, and altered, dioritized sections of these; they also lie within a general zone parallelling the granite-volcanic contact. The plotted anomalies have an

intensity of 1000-plus gammas; they are probably composites of local groups of weaker and stronger anomalies. The more significant anomalies, or parts of these, are those which appear in close spatial relationship to (1) geochemical anomalies (2) electromagnetic anomalies (3) occurrences of radioactivity. This combination occurs within, on the projected trend, and marginally to the indicated geochemically-anomalous areas.

The larger negative magnetic anomaly lies within the main granite body. It may be due to hydrothermal alteration of the granite, or to an exceptionally thick accumulation of overburden. The probable cause might be determined by direct observation of available outcrops, supplemented by ground-magnetometer surveys; the latter possibility may be substantiated or negated by topographic studies.

RECOMMENDATIONS

The current geochemical reconnaissance should be completed. Following this, broadly and/or inconclusively-anomalous areas may be more closely delineated and reduced by follow-up detailed geochemical exploration. These general areas should be additionally tested by magnetometer and I/P survey methods prior to undertaking exploratory trenching and/or drilling.

Respectfully submitted,

W. M. Sharp, P. Eng.

DOMINION OF CANADA:

PROVINCE OF BRITISH COLUMBIA.

TO WIT:

In the Matter of the current application for acceptance of geochemical and airborne geophysical exploration as assessment work on the Toe #1-23 M.C.'s, and with reference to Mineral Act, Chap. 244, Revised Statutes of British Columbia, 1960:

I, William M. Sharp, P.Eng.,

of 808 - 900 W. Hastings Street, Vancouver 1, B.C.

in the Province of British Columbia, do solemnly declare that I am a Consulting Geological Engineer retained by Consolidated Skeena Mines Ltd. (N.P.L.), and that under my direction geochemical soil-sampling surveys and an airborne geophysical survey was carried out on the following mineral claims held by Consolidated Skeena Mines Ltd. in the Nicola Mining Division:

Toe #1-#23 M.C.'s Record No's. 32702-32724 incl.

A total of $4,741.70 was expended on direct exploration in regard to such surveys and report thereon dated October 15, 1967, as detailed in report under heading "Exploration Expenditures", and summarized as follows:

A. Geochemical Exploration	$ 841.70
B. Airborne Geophysical Survey	$3,650.00
C. Geological Supervision, field map compilation, and report preparation, and excluding fees for general geological consulting	$ 250.00
Total:-	$4,741.70

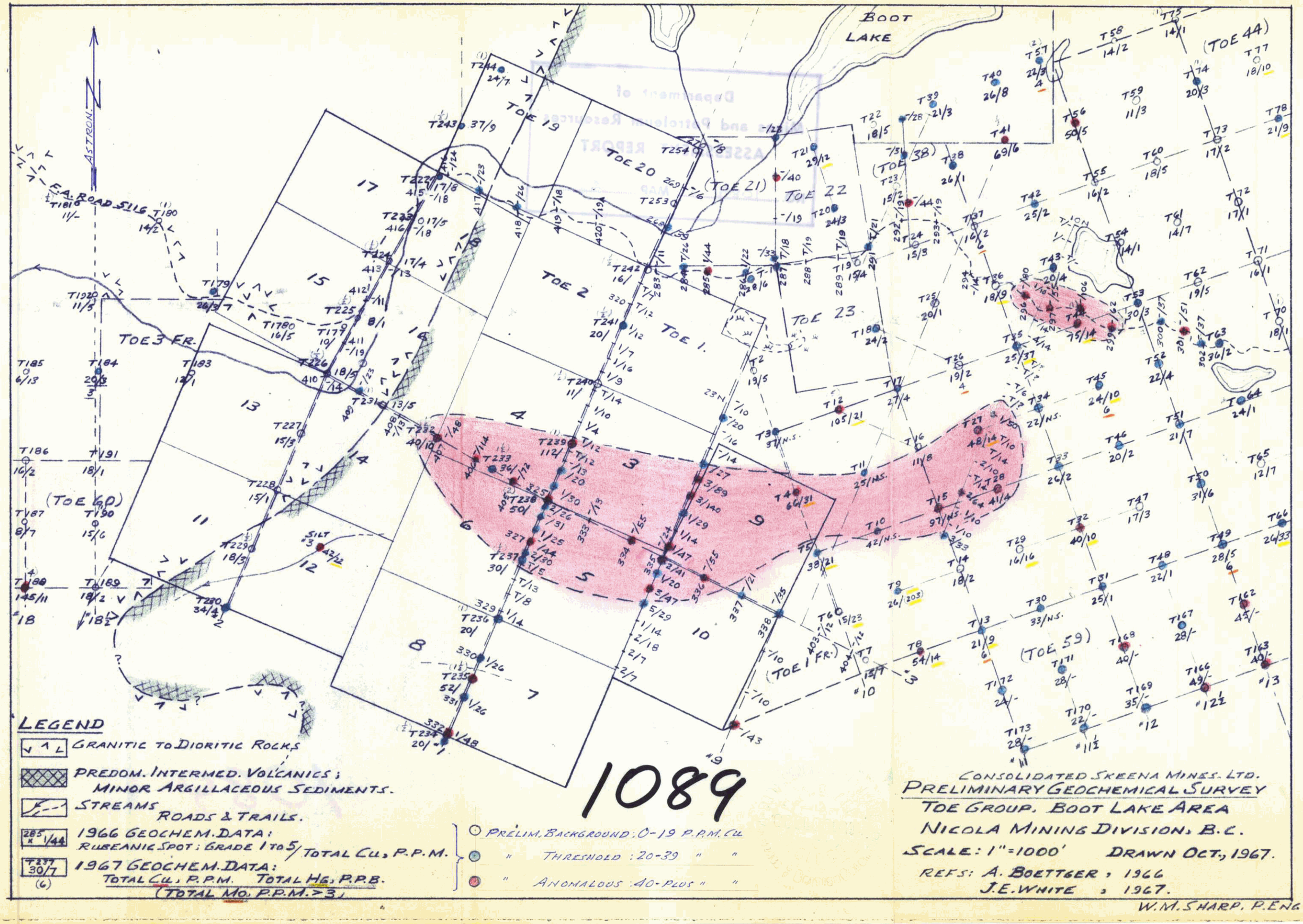
And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the CITY of VANCOUVER, in the ~~Province of British Columbia,~~ this 16th day of OCTOBER, 1967, A.D.

W. M. Sharp, P. Eng.

W. J. Sharp

~~A Commissioner for Taking Affidavits for British Columbia~~ or
A Notary Public in and for the Province of British Columbia.



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CONSOLIDATED SKEENA MINES. LTD.

PRELIMINARY GEOCHEMICAL SURVEY

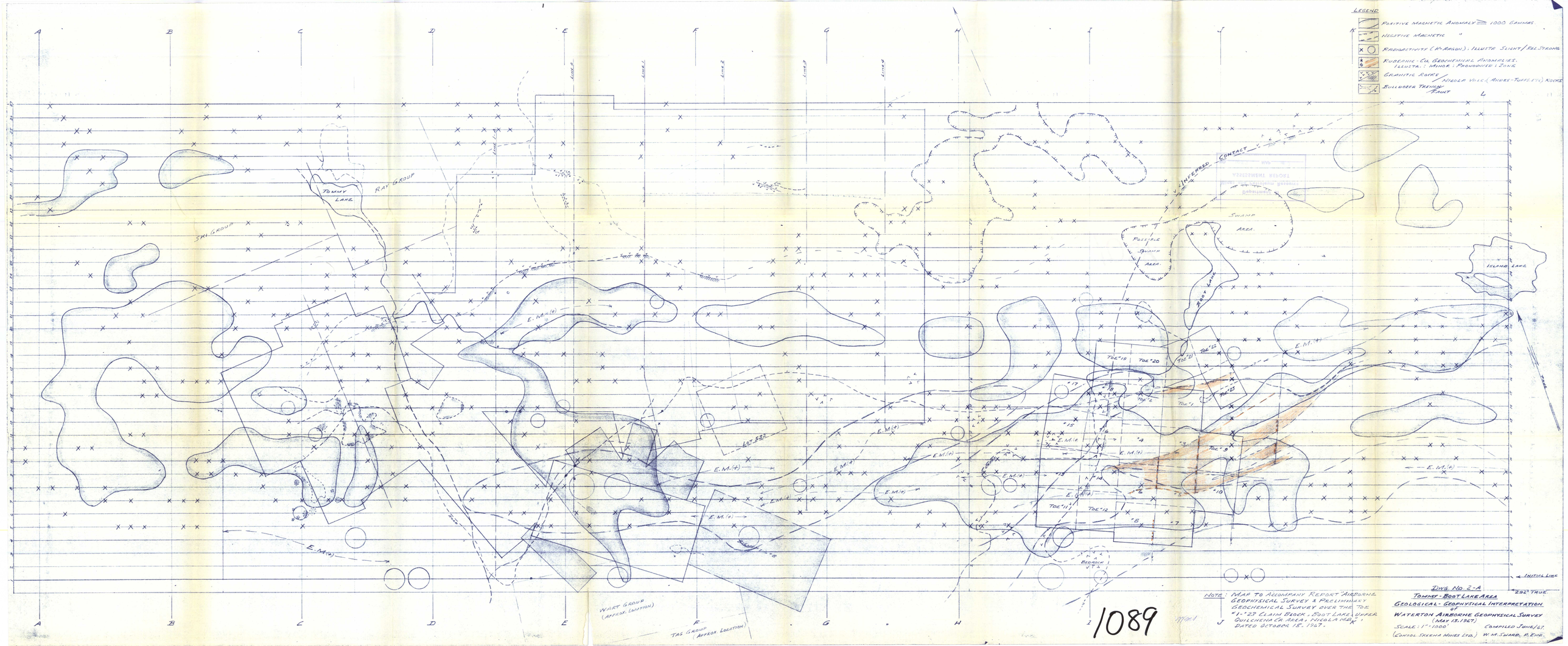
TOE GROUP. BOOT LAKE AREA

NICOLA MINING DIVISION, B.C.

SCALE: 1"=1000' DRAWN OCT., 1967.

REFS: A. BOETTGER, 1966
J.E. WHITE, 1967.

W.M. SHARP, P.ENG.



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NOTE: MAP TO ACCOMPANY REPORT "AIRBORNE GEOPHYSICAL SURVEY & PRELIMINARY GEOCHEMICAL SURVEY OVER THE TOE #1-23 CLAIM BLOCK, BOOT LAKE, UPPER GUILDFORD CO. AREA, NICOLA MIN. DIV." DATED OCTOBER 15, 1967.

DWG. NO 2-A

TOMMY - BOOT LAKE AREA

GEOLOGICAL - GEOPHYSICAL INTERPRETATION

OF

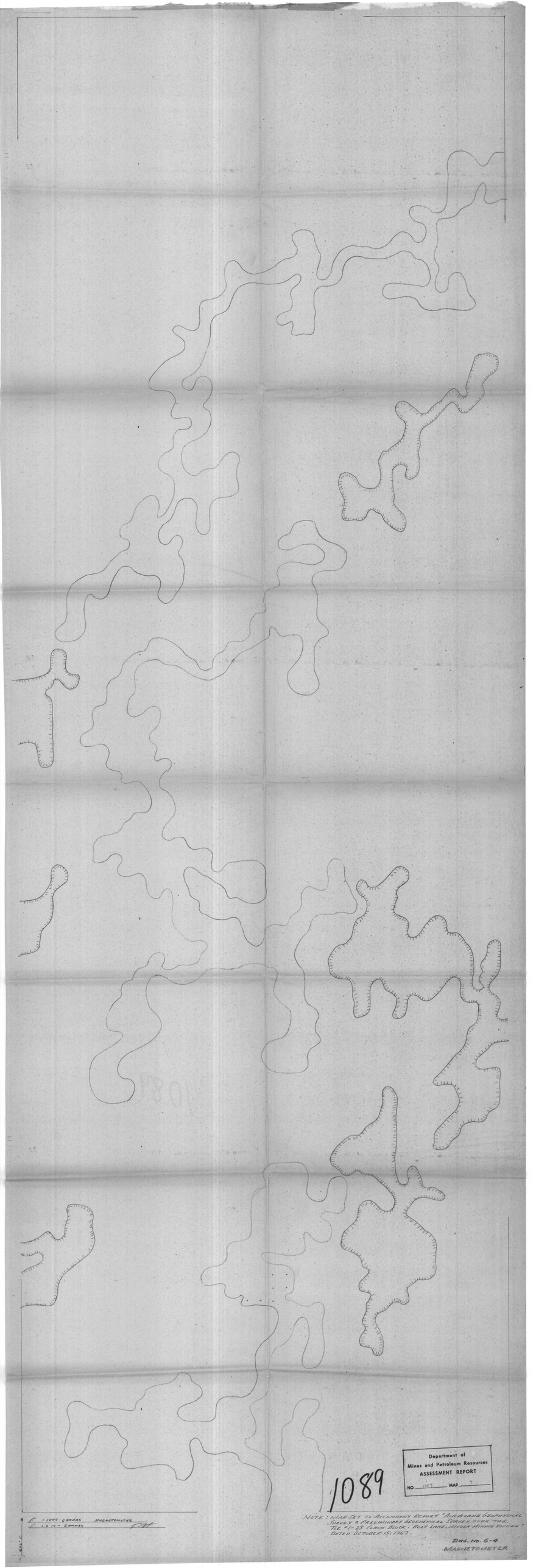
WATERTON AIRBORNE GEOPHYSICAL SURVEY

(MAY 13, 1967)

SCALE: 1" = 1000'

COMPILED JUNE/67.

(CONSOL. SKEENA MINES LTD.) W. M. SWARD, M. ENG.



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 1089 MAP 7

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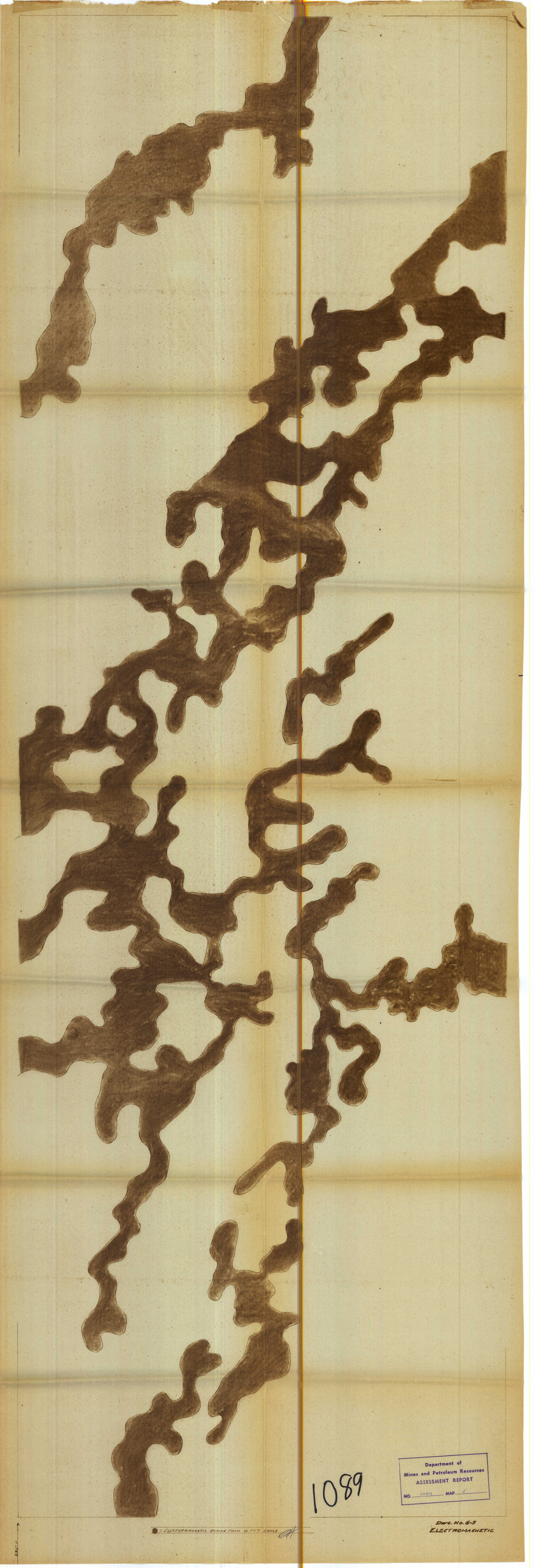
NOTE: THIS SET TO ACCOMPANY REPORT "AIRBORNE GEOPHYSICAL SURVEY & PRELIMINARY GEOCHEMICAL SURVEY OVER THE TOE #1-23 CLAIM BLOCK, BOAT LAKE-HIGH MINING DIVISION" DATED OCTOBER 15, 1967.

DWG. NO. G-4
MAGNETOMETER

C = 1000 GAMMAS MAGNETOMETER
C = 870 - GAMMAS



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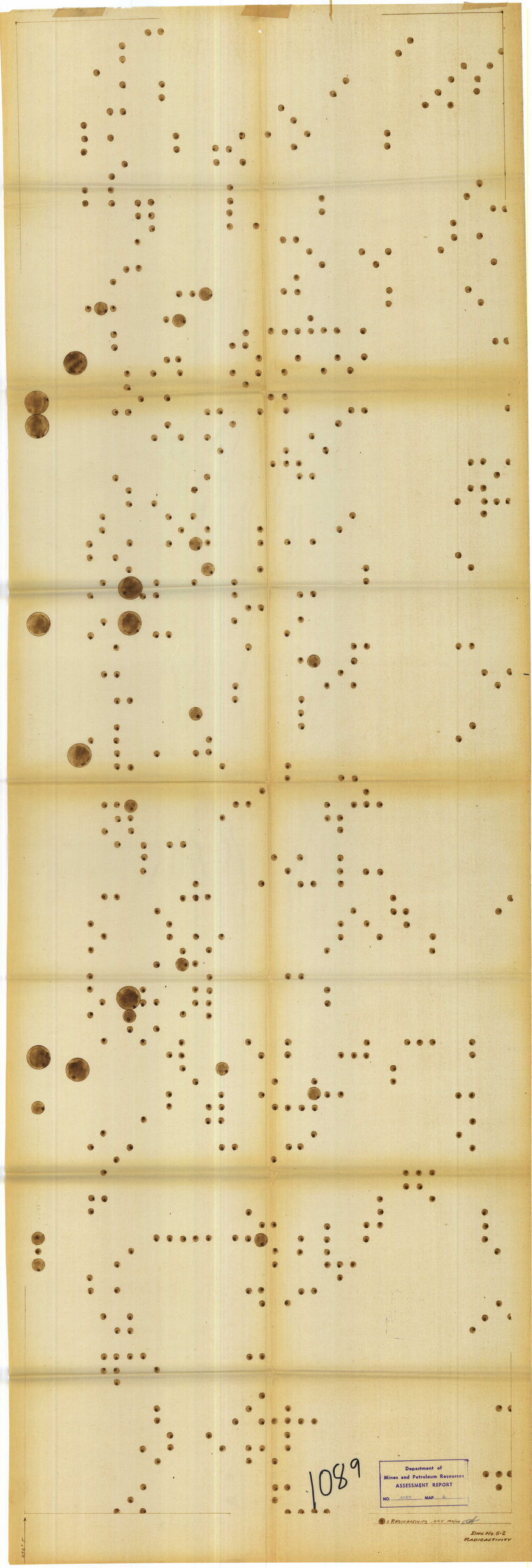
3 ELECTROMAGNETIC SECTION FROM 45 DEG ANGLE

DWG. No. E-3
ELECTROMAGNETIC



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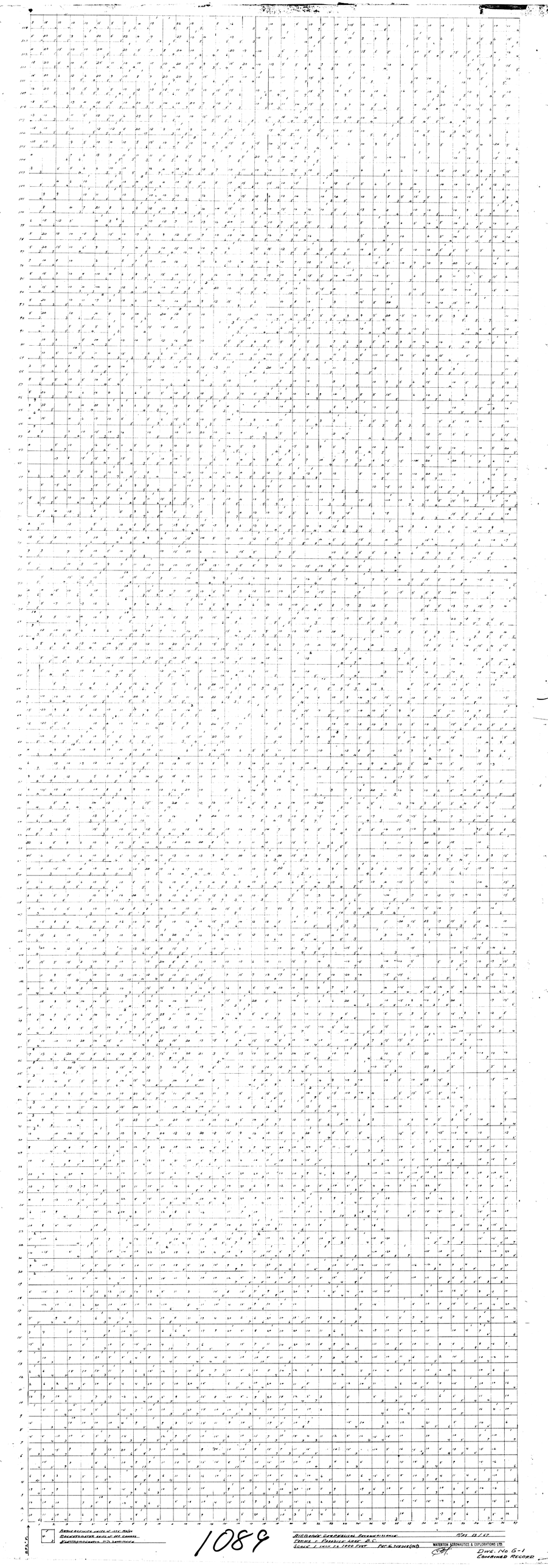
1 RADIOACTIVITY 1000' PER INCH

DWG No. G-2
RADIOACTIVITY



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AIRBORNE GEOPHYSICAL RECONNAISSANCE
TIMMINS - PEMBROKE AREA, ONT.
SCALE 1 INCH = 1000 FEET PER W. JONES (ONT)

MAY 12/67

WATERTON AERONAUTICS & EXPLORATIONS LTD.

DWG. NO G-1
COMBINED RECORD