

TRANS YUKON EXPLORATION LTD.

Lindsay Group

Whitehorse M.D. 105-C-14

Yukon Territory

REPORT

by

P. H. Sevensma, Ph.D., P. Eng.

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1. INTRODUCTION

The Lindsay group of claims has been acquired by Trans Yukon Exploration Ltd. (N.P.L.), Box 758, Whitehorse, Y.T.

This group covers an area of transported gossans lying in the low valley south of Quiet Lake, map sheet 105-C-14, Y.T.

These gossans are associated with a significant magnetic high, in an area immediately adjacent to the Canol road and of easy access.

High nickel values occur in rusty material assaying over 1% manganese, deposited by an active spring, and it is believed that this situation is an attractive exploration target.

References used are as follows:

G.S.C. Memoir 326, R. Mulligan, Teslin Map area.

G.S.C. Map 7-1960, Quiet Lake 1"=4 miles.

Geophysics paper 7002 G, Teslin, Sheet 105-C

Geophysics paper, 1345, Sidney Creek, Sheet 105-C-14

G.S.C. Map 30-1963, 1"=50 miles.

G.S.C. Paper 67-40

The Mineral Industry of Y.T. and S.W. District of MacKenzie, 1966
by D.C. Findlay

Report on Geochemical Survey, Lindsay Claim Group by J.A. Coope
for Newmont Mining Corp., January 1967

Examination of Lindsay claim group, by R.W. Phendler October, 1967

Personal observations and notes by the writer, November 5, 1967

A search of the claim records has been made personally by the writer, and in the field, the claims located in the NE quadrant were found to have been staked in accordance with the Yukon Quartz Mining Regulations. Available information indicates that the same applies to the remaining claims.

2. PROPERTY, LOCATION AND ACCESS

The property consists of the following claims.

<u>Nos.</u>	<u>Claim</u>	<u>Grant No.</u>	<u>Expiry Date</u>
10	Quiet, 1-10	Y20916 - 25	Sept. 11, 1968
6	South 1-6	27 - 32	Sept. 11, 1968
14	Core 1-14	33 - 46	Sept. 11, 1968
1	Gossan 8	Y20926	Sept. 11, 1968
15	MS-32-46	Y10415-Y10429	Sept. 9, 1968
16	Mineral 1-16	Y 9773-Y9788	Aug. 1, 1968
16	Spring 1-16	Y 9789-Y9804	Aug. 1, 1968
6	Gossan 1,2,4-7	Y 9805-Y9810	Aug. 1, 1968
1	Hidden Minerals	Y 8289	June 2 1968
1	Mineral Spring	Y 8290	June 2 1968

86 Mining Claims

All claims lie on claim sheet 105-C-14, between elevations of 2650' and 2850', in the Whitehorse Mining District.

The original showing lies at Latitude 61°56'N and Longitude 133°02'W.

The group is accessible by a 3 mile truck road from mile 45 on the Canol Road. Snowfall is moderate. There is abundant water and timber on the property and in the general area.

There is also a large cabin, originally built as a fishing lodge, about 1½ mile North of the property. This lodge would be an excellent base camp for the property and only minor improvements to the old tote-trail are required to provide a good truck road between this building and the property.

3. GEOLOGY, AREAL

The claims and surrounding area are underlain by schists originally mapped as the Yukon Group. R. Mulligan, in G.S.C. Memoir 326, defines these formations as the Big Salmon Complex, which in this area underlies Mississippian limestone with apparent conformity.

These formations are part of the Central Yukon schist complex, for which an approximate Mississippian age has been postulated as shown on the G.S.C. correlation map 30-1963 (See Fig. 1)

This complex is characterized by an assemblage of clastic sediments, minor limestones and dolomites, relatively minor volcanics, and ultrabasic intrusives.

These schist formations are the source beds of the Klondike Placer deposits and also contain the large bedded sulphide deposits of the Vangorda Creek area, NW of Ross River.

The actual age and the regional relationships of these formations are still a matter of discussion, with some evidence for either a Cambrian or a Mississippian age.

To the West of Quiet Lake these formations have been intruded by a large granodioritic intrusive the SE termination of which is close to the NW corner of the Lindsay claim group. (See Fig. 1)

The area bordering this intrusive on the SW shows a number of mineral showings of interest, i.e.- minor placer gold on Iron creek, on lower Boswell River, and in the Livingstone area, silver-lead occurrences on the Boswell River and as yet unexplored porphyry intrusions with abundant pyrite and minor gold in the Upper Slate Creek and Red Mountain Creek area.

The same belt of schists continues in a SE direction towards Wolf Creek, where so far little evidence of mineralization has been encountered.

Of significance is the fact that the claims lie in the favorable belt of productive schists and in an intrusive border area with well above average evidence of mineralization.

4. GEOLOGY, LOCAL

The claim area covers an area underlain by an outstanding isolated magnetic anomaly detected by the airborne survey flown during the summer of 1961 by Aero Surveys Ltd. for the Department of Mines and Technical Surveys in Ottawa (Maps 7002 G, 1"=4 miles and Map 1345 G, 1"=1 mile) See Fig. 2.

The attention was originally drawn to the area by the presence of several areas of transported gossans in which recent gravels have been cemented by iron and manganese bearing solutions derived from local springs.

Several patches at least 200' to 400' across of this material are present on the property as seen by the writer, and a large area about a mile long and a quarter of a mile wide in the central area of the claims is reported to show abundant rust and other patches of gossan.

These gossans have a subtle surface expression and are not readily apparent until shallow test pits are dug, and there does not appear to be any significant change in vegetation due to their presence.

The writer observed one outcrop of N-S striking schistose quartzite with a 25° East dip and a small outcrop of gabbroic rock with considerable biotitization and an associated magnetic high.

Some serpentinized ultrabasic formations have been reported in a creek on the West side of the property.

Transported gossans as described above are known in other areas in the Yukon, and in Vangorda Creek, are derived from a large commercial base-metal carrying sulphide body which has outcrops in several locations.

Local Geology Cont'd

In most cases, it has not yet been possible to determine the origin of gossans of this type because of their remoteness or the presence of extensive overburden. In some cases, barren pyrite and or pyrrhotite in disseminated form may be the source; in other cases they may reflect the presence of economic sulphide deposits nearby.

The airborne magnetic anomaly has, in previous work, been approximately pinpointed on the ground; it is similar to anomalies associated with serpentinized ultrabasic and some outcrop of this rock type has been reported near the West edge of the property.

Ultrabasic bodies in the Yukon occur generally in belts, but in this particular case the nearest outcrop of ultrabasic rock on strike lies about 25 miles to the West in the Boswell River area, and the isolated anomaly on the property is not part of a well defined belt of ultrabasics. A gabbroic or diabasic rock could therefore be the cause of the magnetic high instead.

The schists found on this property are similar to those known as a favourable host unit elsewhere in the Yukon. With definite and encouraging signs of mineralization along the SW border of the main granodioritic intrusive, and in association with an outstanding magnetic anomaly, the type of gossans covered by the Lindsay group constitute a worthwhile exploration target which warrants further investigation.

Topographical features indicate the property to lie at the intersection of a system of NW and NE lineaments probably representing bedrock fractures and/or faults.

5. PREVIOUS WORK

After intermittent prospecting over and around a few claims held for several years, more extensive staking was done in 1966 and the property optioned to Newmont Mining Corporation of Canada Ltd. who carried out a limited magnetometer survey and a geo-chemical soil survey for lead and zinc, and recommended an electro-magnetic Turam survey after additional linecutting.

Previous Work Cont'd

This company, however, did not exercise its option and in 1967, a limited Ronka EM-16 was conducted by an Atlas Exploration crew over a small part of the property.

These limited programs have provided some valuable information. Some well defined local magnetic anomalies were found, one of which is associated with a weakly anomalous zinc-(lead) area, and some interesting limited conductors suggesting the presence of steeply dipping conductors, in a probably flat dipping rock environment, have been located.

The geochemical soil survey was conducted for lead and zinc only, and the copper-nickel possibilities were not investigated. The writer believes that the latter have much higher odds in the presence of a probable basic or ultrabasic intrusive, especially so as a sample of gossan taken by owner J. Lindsay in September 1966 and submitted to Coast Eldridge showed the following values in a semi quantitative spectrographic analysis (in parts per million):

Cu 700	Ag 0.5
Pb 10	Zn 1000
Mn 2000	Si Matrix
Ni 800	Mg 10,000
	Ca 5,000

Manganese is a collector for other metals and is average in this sample. The copper and nickel values are high; this may be due to adsorption by manganese of widespread low grade copper-nickel, or of nickel-copper derived from an economic concentration.

The reported copper-nickel values are of sufficient magnitude to warrant further investigation.

Previous Work Cont'd

(A) Newmont Magnetic Survey

Five lines from $1\frac{1}{2}$ to $2\frac{3}{4}$ mile long were run in an E-W direction across the property at approximately 2800' interval, with stations every 100', using an Askania Torsion Balance.

In the NE part of the claim area, detail work was done on approximately one square mile using E-W lines spaced at 400'.

Values in gammas varied from about 72000 in a small area near the assumed AM high to about 62000 in some of the magnetic lows at the West edge of the property, versus an aeromagnetic relief of about 1600 gamma (60,000-58,400).

The wide spacing of the lines allow only an approximate definition of the outline of the magnetically high area, i.e.- of readings generally higher than 65,000, interpreted as representing the outline of a possible ultrabasic plug.

In the NE part of the property, two small localized anomalies represent an observed gabbroic plug and a probable gabbroic plug.

A $\frac{3}{4}$ mile long elongated high (64,500-65,000 gamma) in this area has been interpreted by Newmont Mining Corp. as a zone of several percent magnetite lying along a NNW striking fault.

This is an interpretation only, and bulldozer trenching and one or two drill holes are required to investigate the source of this magnetic feature, which lies more or less along the centre of a weak geochemical zinc anomaly, and which is associated with several weak electromagnetic conductors.

Previous Work Cont'd

(B) Newmont Geochemical Survey

This survey covered the same lines as the magnetic survey. Samples for lead-zinc were taken in the A₀ horizon (0-3") and in the B and C horizons (30").

The direction of sub-surface drainage is not clearly established; the thickness of overburden is unknown and the relative proportions and positions of glacial and of alluvial material are also unknown factors.

Lineaments suggest both NE and NW trending depressions in the bedrock and sub-surface drainage is likely to flow both Northerly into Quiet Lake and Easterly toward the nearby Nisutlin River through the Cottonwood Creek depression.

Strings of ponds in both a NE and a NW direction are undoubtedly related to significant sub-surface drainage channels.

The bedrock topography is likely to exhibit sharp ridges in hard formations, with softer structures gouged out by ice during one of the periods of glaciation that have affected the area.

In summary, the surface and the sub-surface drainage may be very different, and any interpretation of a geochemical soil survey should take this into account.

In the absence of data on manganese, copper and nickel, the lead-zinc data should be studied with some reservations. They may be summarized as follows:

Zinc - Values for both the 0-3" and the 30" depths show a range from 15-550 p.p.m. The highest values occur near the main mineral spring. The higher values, i.e.-greater than 80 p.p.m., are scattered but show a definite concentration centered on a long narrow magnetic anomaly.

Newmont's conclusion is quoted as follows:

"The coincidence of geochemical and magnetic features strongly suggests that the data is reflecting bedrock conditions."

Lead - The lead values range from 1-175 p.p.m. Normal background is from 1 to about 25. The higher values are scattered, with a weak concentration in the vicinity of the zinc high near the Southern portion of the elongated magnetic high.

In summary, the geochemical zinc-lead data show some concentration of the zinc in the area of the most interesting secondary magnetic high, and the lead shows a weak concentration near the south end of this high.

No true dispersion pattern related to a shallow source can be recognized, as the values are too low and too scattered. The lack of knowledge of overburden conditions precludes any definite conclusion.

(C) Atlas EM Survey

This survey was carried out over about the same area as Newmont's detailed square mile survey. The instrument used was a Ronka EM-16, with readings on lines 400' apart and at 200' intervals only. Good conducting zones require 50' intervals.

The survey showed some good relatively short conducting zones with probable steep dips. As formational dips have only been observed in one location where they were relatively flat, a more detailed survey at close spacing is required of the conducting zones, as well as a closer analysis of the magnetic data in the vicinity of the conductors.

The EM-16 proved a good instrument in this area and has eliminated certain areas without conductivity and has also suggested an ENE trending non-conductive structure, which offsets both the EM and the magnetic pattern, and which may represent a fault.

The coincidence of the four best defined conducting zones with part of the zinc anomalies is remarkable.

One of these conductors is about coincident with the best magnetic anomaly and it is in this same area that the best lead anomaly is located, providing an interesting triple coincident anomaly (Figure 3) as a good exploration target.

(D) Geology

No geological mapping has been carried out by either Newmont or Atlas.

The writer's examination has proven that some outcrop is present and the property should be mapped on a reconnaissance basis in an early stage of any further program.

6. RECENT DATA

The writer examined the NE quarter of the property on November 5, 1967, at which time there was about 5" of light snow on the ground.

One new outcrop was found, the one trench cut by Newmont was examined and the area overlying the elongated magnetic high was examined, which showed no topographic expression of this feature.

Two samples were taken near the main mineral spring, and submitted to the Coranex Laboratory in Vancouver, who prepared a geochemical analytical report on November 17, 1967, using atomic absorption after HNO₃ - HCl - H₂SO₄ digestion.

Sample 242 A consisted of fine mud and sludge being currently deposited by the main mineral spring.

Sample 242 B is representative of the solid transported gossan lying within a distance of 50' from this spring, the sample consisting of chips of solid gossan collected in various locations.

Results were as follows in p.p.m.:

	<u>Cu</u>	<u>Pb</u>	<u>Zn</u>	<u>Mn</u>	<u>Ni</u>	<u>Ag</u>
242-A fine	2	NT	580	11,000	1,800	4
242-B solid	2	NT	415	10,000	900	5

NT= Not Detected, or less than 2 p.p.m.

7. CONCLUSIONS

The results of the two recent samples are of considerable interest, as the nickel values are exceptionally high.

As the property covers what is likely to be an isolated ultrabasic plug, the presence of high nickel is of interest.

There is as yet no satisfactory explanation for the presence of high manganese, as too little work has been done.

The high nickel may be due either to solution and dispersion of nickel occurring in low-grade disseminated form within an ultrabasic plug, or to dispersion of nickel out of one or more nickeliferous concentrations lying near or adjacent to an (ultra)basic plug.

In any subsequent fieldwork, these two alternatives should be constantly kept in mind, and attention should be focussed on the problem of the high manganese and its possible effect as a collector of nickel and zinc.

In the Yukon as well as in other mineral districts, like New Brunswick, soil background values compared to significant values are of the following order of magnitude (in p.p.m.)

	<u>Background</u>	<u>Significant Values</u>
Cu	0 - 40	100 - 500
Pb	0 - 30	100 - 500
Zn	10 - 75	150 - 2000
Ag	0 - 0.5	2 - 10
Ni	0 - 40	100 - 500
Mn	300 - 800 ?	6,000 - 10,000 ?

Values in between are threshold values, the interpretation of which depends on the environment; significant values always warrant investigation and anything higher is of considerable interest.

Manganese may be derived from a carbonate deposit (rhodochrosite), from pyrite, from sphalerite, from a manganese siderite deposit, from silver-lead-zinc deposits, from manganese sediments, or from a vein-type deposit of the nickel-cobalt-bismuth silver-manganese-siderite suite.

Conclusions Cont'd

The latter category is an intriguing possibility on this property for several reasons:

Bismuth and manganese occur in most of the silver-lead-zinc deposits associated with the Cassiar Intrusives to the South.

A number of deposits of this category are found in association with basic or ultrabasic rocks.

Coarse biotitization has been observed by the writer in a gabbroic rock associated with one of the small magnetic highs on the property, suggesting differentiation or alteration.

Silver is present in the Boswell River area near the West edge of the Quiet Lake Batholith.

In presence of a large overburdened area with little outcrop further fieldwork should therefore have a wide coverage and be based on geochemical prospecting. Geophysical investigation should be used as a geological mapping tool.

In this type of program, some drilling is expected to be mandatory both for investigation of coincident anomalies and for geological information.

A coincident anomaly is one where EM and magnetic, EM and Geochem, or magnetic and Geochem, or all three, occur in approximately the same location.

Geological information may be critical where either a magnetic, an EM or a Geochem anomaly alone is located and where overburden precludes any other means but drilling for visual assessment.

In further geochemical work, nickel, cobalt, arsenic, manganese, barium and silver should receive consideration, as well as copper. Lead and zinc should only be investigated outside the area previously covered.

8. PROPOSED PROGRAM

Stage 1, firm

Airborne Survey, AM, EM, radiation	\$ 1,500	
Bulldozer stripping, 100 hours @\$35.00	3,500	
Ground Magnetics, 10 line miles	1,000	
Ground EM detail, 15 line miles	1,500	
Geochemical sampling, 300 samples @ \$6.00	2,000	
Geological Mapping & Supervision, 4 weeks	3,000	
Prospecting, 6 weeks	2,500	
Camp Operation	1,500	
Engineering	1,500	
Transportation	<u>1,000</u>	
	\$19,000	
Drilling, 1600' @ \$12.00 overall	<u>20,000</u>	
	\$39,000	
Overhead and Contingencies, 15%	<u>6,000</u>	
Total Stage 1, firm		\$ 45,000

In this Stage, the contingency may involve line cutting by hand methods.

Stage 2, contingent

Drilling, 4000' @ \$12.00 overall	\$ 48,000	
Engineering & Contingencies, 15%	<u>7,000</u>	
Total Stage 2, contingent		\$ <u>55,000</u>
Total Estimated Cost, based on available data		\$100,000
Stage 1, Airborne follow-up, geophysical contingency		10,000
Stage 2, Airborne follow-up, drilling contingency		<u>10,000</u>
Total Budget		\$ <u><u>120,000</u></u>

It is anticipated that Airborne work will locate additional targets on the claim group. The added contingency for each stage makes provision for the additional ground geophysics and drilling that may be required if this situation arises.

It is recommended to use the Waterton airborne system, which provides at low cost the relationship between magnetics, conductors and radioactivity. In the presence of the expected type of mineralization which may be associated with higher than usual radioactivity, a radiation survey may prove very significant. In the Waterton Method, a specially equipped low wing single engine aircraft flying at a minimum terrain clearance of three-hundred feet, on a straight course parallel to contours, monitors electromagnetic, magnetic and radiation response along the designated flight path.

The electromagnetic system employs a sixty-five foot horizontal loop transmitting coil with a vertical loop receiving coil suspended in a trailing bird. A 1000 c.p.s. signal is transmitted and the receiver measures the local distortion. The distortion registers on a meter calibrated from 1 to 25. The meter reading is a function of the quality of an underlying conductor. Extreme sensitivity and deep penetration are claimed for this system.

A PMF-3 fluxgate magnetometer is used to measure the vertical magnetic field. Readings are recorded at five hundred foot intervals in one hundred gamma increments.

The scintillometer provides data on the radioactive emission rate of underlying formations which are of assistance in determining formational contacts as well as testing for the presence of uranium or thorium.

Relative ground location is confirmed by a positioning camera.

9. SUMMARY & RECOMMENDATIONS

The Lindsay Group covers an isolated and unique magnetic anomaly which is likely to reflect the presence of a basic or ultrabasic plug lying off the SE tip of a large granodioritic intrusive within the productive Yukon schists.

The SW border zone of this batholith exhibits as yet untested silver-showings and minor placer gold deposits.

A mineral spring and an associated gossan patch have revealed unusually high values in nickel and manganese, with medium values in zinc, minor lead and apparently little copper.

A geochemical soil survey, a localized ground magnetic survey and a partial EM survey, all of a reconnaissance type, have indicated an interesting magnetic anomaly surrounded by a weak halo of above-background zinc values and several conductors of limited extent, unlikely to be caused by graphite.

Preliminary interpretation of this data suggests that they are consistent with the presence of nickel mineralization, possibly of the nickel-cobalt-bismuth-silver-manganosiderite type in steeply dipping fracture zones.

As a number of other and untested gossan areas and rusty springs has been reported, further investigation of this group of claims is recommended, with additional soil sampling along lines stripped by a bulldozer and followed by reconnaissance and detail magnetic and electromagnetic work and by geological mapping supplemented by some core-hole drilling, as Stage 1, at a total cost of \$45,000.

In case of encouragement, an additional amount of drilling will be required, estimated to cost about \$55,000.

Summary & Recommendations Concluded

As it is expected that an aircraft carrying a magnetometer, an electromagnetic device, a scintillometer and a positioning camera will be in the Yukon in the near future, it is recommended to fly approximately 80 line miles with this equipment, which affords a low cost and rapid reconnaissance method. The use of the scintillometer is strongly recommended in this situation, as the above described type of mineralization may be characterized by unusual radio-activity.

Respectfully submitted,

A handwritten signature in cursive script, reading "P. H. Sevensma". The signature is written in dark ink and is positioned above a horizontal line that extends across the width of the signature.

P. H. Sevensma, Ph.D.; P. Eng.

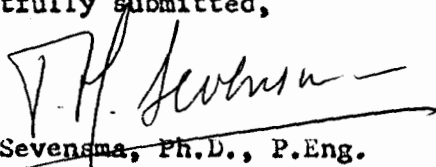
November 20, 1967
Vancouver, B. C.

CERTIFICATE

I, PETER H. SEVENSMA, of Vancouver, B.C., do hereby certify that:

1. I am a graduate of the University of Geneva, Switzerland (Physics and Chemistry, 1937; Geology and Mineralogy, 1937) where I obtained my Ph.D. in Geological and Mineralogical Sciences in 1941.
2. I am a Consulting Geological Engineer and a registered member in good standing of the Association of Professional Engineers of British Columbia and of the Association of Professional Engineers of Yukon Territory.
3. From February 1948 until December 1965 I have been engaged continuously in mining and exploration geology in the employ of Cominco Limited. As a Senior Exploration Geologist, I have worked extensively both in Eastern and Western Canada.
4. I have personally examined the claims which are the subject of this report as well as a number of other showings in the general area.
5. I have not received, nor do I expect to receive or acquire, directly or indirectly, any interest in any of the properties or securities of Trans Yukon Exploration Ltd.

Respectfully submitted,

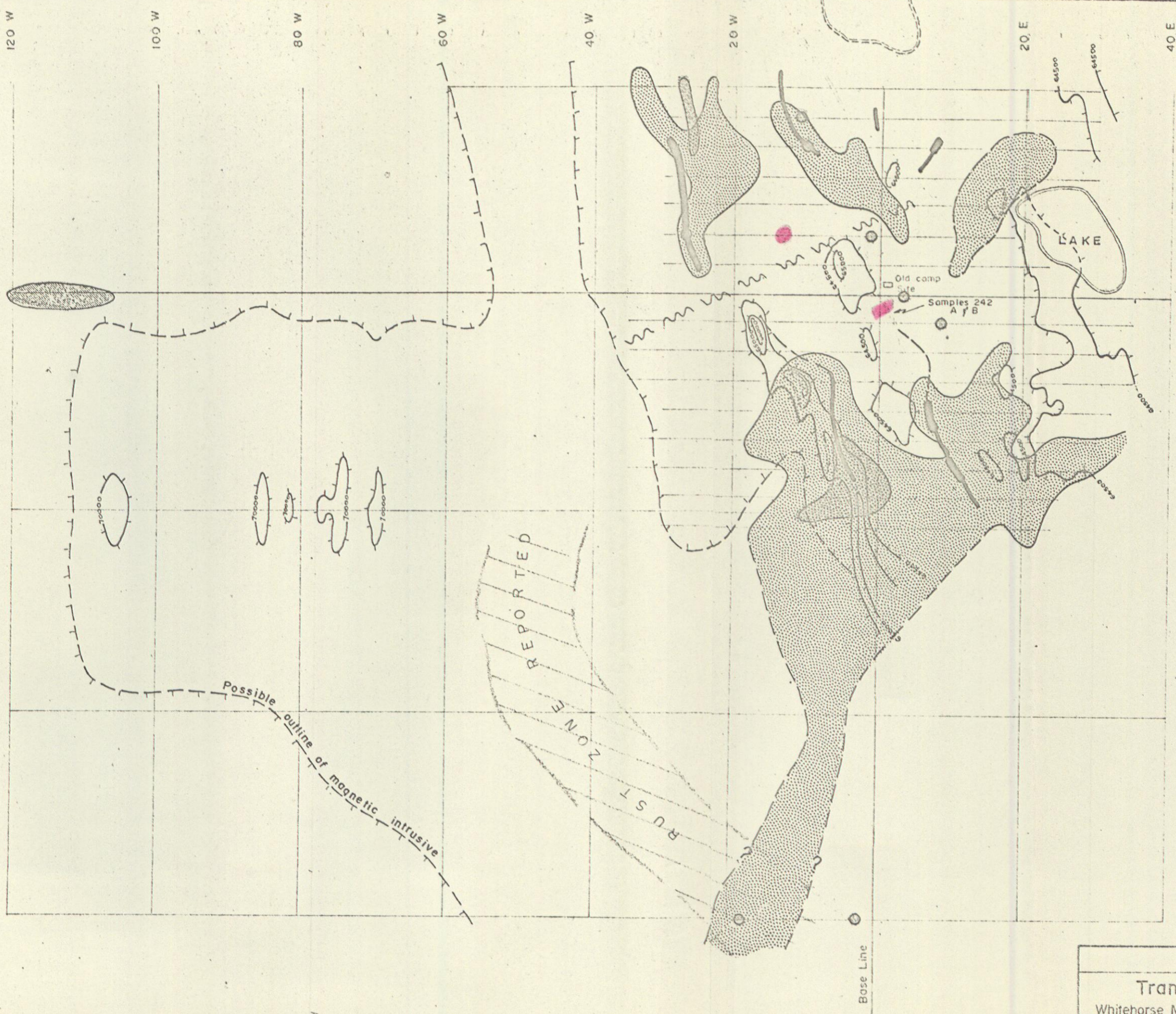

P. H. Sevensma, Ph.D., P.Eng.

November 20, 1967
Vancouver, B.C.

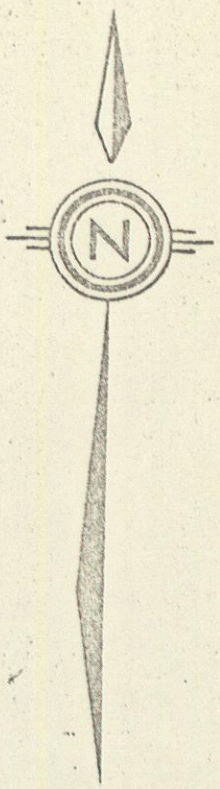


FIG. 2




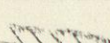

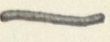
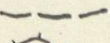
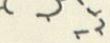
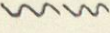
LINDSAY GROUP	
Trans Yukon Exploration Ltd.	
Whitehorse M.D.-Y.T.	
P. H. Sevensma Consultants Ltd. — Vancouver B.C.	
Nov. 1967, 105-C-14,	



28 N
24 N
20 N
16 N
12 N
8 N
4 N
00
4 S
8 S
12 S
16 S
20 S
24 S
28 S
30 S
32 S



LEGEND

-  Gossan Patches
-  Zinc mostly > 100 p.p.m.
-  Lead mostly > 32 p.p.m.
-  Area of Rust
- E.M. CONDUCTORS**
-  Strong
-  Medium
-  Weak
-  Magnetic high
-  Possible Fault

58 S
86 S

LINDSAY GROUP
 Trans Yukon Exploration Ltd.
 Whitehorse M.D. Y.T. East—West Grid Lines
 P. H. Sevensma Consultants Ltd.—Vancouver B. C.
 November 1967, 105-C-14, SCALE 1:320'

FIG. 3

TRANS YUKON EXPLORATION LTD.

105 C-14 60°57'N 133°W

Whitehorse M.D. Y.T.

Preliminary Report On

Airborne Geophysical Survey

Survey Completed Jan. 26, 1968.

by

H. S. Aikins

under direction of

P. H. Sevensma Consultants Ltd.

February 15, 1968

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ILLUSTRATIONS

Figure 1	Location Map	1" = 1 mile
Figure 2	Airborne Geophysical Survey Data	1" = 1000'
Figure 3	Aeromagnetic Survey	1" = 1000'
Figure 4	AEM Survey	1" = 1000'
Figure 5	Proposed Program-1968	1" = 1000'

1. INTRODUCTION

The Survey which is the subject of this report was carried out as recommended in the previous report on this property issued November 20, 1967. Regional and local geology are discussed in that report as is the history of previous work and results obtained.

2. PROPERTY

The property, at the time that the Survey was flown, is shown to consist of the following mineral claims: -

<u>Name</u>	<u>Grant No.</u>	<u>Date of Record</u>
Hidden Minerals	Y 8289	June 2/67
Mineral Spring	Y 8290	June 2/67
Mineral 1 to 16 incl.	Y 9773 to Y 9788 incl.	Aug. 1/66
Spring 1 to 16 incl.	Y 9789 to Y 9804 incl.	Aug. 1/66
Gossan 1,2,4,5,6&.7.	Y 9805 to Y 9810 incl.	Aug. 1/66
Gossan 8	Y 20926	Sept.11/67
M.S. 32 to 46	Y 10415 to Y 10428 incl.	Sept. 9/66
Quiet 1 to 10 incl.	Y 20916 to Y 20925 incl.	Sept.11/67
South 1 to 6 incl.	Y 20927 to 20932 incl.	Sept.11/67
Core 1 to 14 incl.	Y 20933 to Y 20946 incl.	Sept.11/67

3. AIRBORNE GEOPHYSICAL SURVEY

(a) Method

This method incorporates the combined readings from a fluxgate magnetometer, a nucliometer and an electromagnetic unit recorded on 8 mm. film and timed electrically to enable the readings to be entered on a grid of a chosen scale.

To give the most accurate forms to the anomalies, level lines are flown over the area, and a fixed-wing aircraft is chosen as the most suitable vehicle for this purpose.

Airborne Geophysical Survey Method Cont'd

Any inaccuracy in the timed readings due to airspeed error is calculated out before the readings are entered on the grid.

All the instruments are set on "0" over a pre-determined spot near the survey area and this adjustment is made after each 1½ hours of survey.

Station-keeping is accomplished by flying between two lines drawn on a map with a scale of 1:50,000 and referring to land features. A directional gyro is also used, set to true heading by astro compass. Altitude of the level line is usually 500 ft. over the highest point of ground along the line.

Ground checks from over twenty areas have found the accuracy of the method to be between 250 and 500 ft. on a 500 ft. grid.

Fluxgate Magnetometer: PMF-3 Sharpe, adjusted to return to "0" fast enough for the movement of the aircraft. Readings are in units of 100 gammas.

Nucliometer: Detectron - DR229, 24 tubes, which is more suitable for airborne work. Readings are in units of .005 MT/HR.

Electromagnetic: 55 ft. cable attached to the bottom of the aircraft. A small 10 oz. bird is drawn behind the aircraft as a receiver, powered by its own mercury cell. A magnetic field is transmitted through the cable at a thousand cps, 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 indicates electromagnetic activity in the area, such as disseminated sulphides, which usually read 3 to 6; heavy sulphides 10 to 15. It also picks up other electrical fields besides those produced by the transmitted field.

Airborne Geophysical Survey(b) Results and Interpretation

All data provided by this survey are shown in Fig. 2 in numerical form.

(i) Magnetic

Figure 3 shows the isomagnetic contours prepared from the flight data. The somewhat linear trend observed in a North East-South West direction may be partially attributed to slight variations in terrain clearance and to only partial compensation for magnetometer orientation on some of the lines flown in opposite directions.

A fairly well defined magnetic high is revealed, which corresponds with other magnetic data derived from previous ground and airborne surveys. This high is believed to be the reflection of the near surface trace or sub-outcrop of a basic pluton, which in all probability is a more or less serpentinized peridotite, identified as unit 11 on G.S.C. map 1125 A.

(ii) Electromagnetic

Background response over much of the survey area was higher than is normal with this system. Overburden effects and weakly conductive units within the underlying Big Salmon Complex are however, somewhat suspect as lower values are noted along Line 1 over the exposed granite. In general, all values under 5 and isolated higher reading were disregarded. Consistent higher reading in the range of from 6 to 12 are considered anomalous. These areas are shown on Fig. 4.

4. SUMMARY

It may be expected that favourable host rocks on the periphery of a ultramafic intrusive provide an excellent environment for the deposition of nickeliferous sulphides. The location of the AEM

Summary Cont'd

anomalies is consistent with this hypothesis and they are therefore considered suitable targets for detail work.

5. RECOMMENDATIONS

It is recommended that a program of preparatory work be carried out during a period of suitable winter weather, as may be expected in March and early April. This would take advantage of the seasonal availability of equipment. Line-cutting and ground geophysical surveys in areas of this type are not handicapped and in fact may be made easier due to the absence of foliage. Winter roads are easier to construct and maintain. Shallow trenches to expose soil and drift profiles may also be located at intervals suitable for a geochemical orientation survey. A cost breakdown of this work is estimated as follows:

Bulldozer trenching and line cutting 100 hr. contract incl. mobilization	* \$ 2,500.00
Camp maintenance, transportation & communication	\$ 1,000.00
Ground Geophysical Surveys: (Ronka & Crone) 15 line miles at \$75.00	\$ 1,125.00
Geochemical Orientation & Reconnaissance 100 samples @ \$5.00	\$ 500.00
Line Cutting and Camp Labour	\$ 1,225.00
Consulting Fees and Technical Supervision	\$ 650.00
Sub-total	\$ <u>7,000.00</u>
Contingencies 15%	\$ <u>1,000.00</u>
Recommended Budget	\$ <u><u>8,000.00</u></u>

*Cost estimate based on quotation by Mr. D. Robertson who has contacted a competent operator now available.


The balance of the \$45,000 program recommended for Stage 1 in the Report of November 20, 1967 should be deferred until weather conditions permit.

Respectfully submitted,


H. S. Aikins

HSA/cm

Endorsed by:



P. H. Severson, Ph.D., P.Eng.

A P P E N D I X "A"

List of Personnel Employed

Geological Consultants

P.H. Sevensma Cons. Ltd.
715-850 West Hastings Street
Vancouver 1, B.C.

Geophysical Contractor

Waterton Aeronautics and Exploration Ltd.
4210 Almond Rd.
West Vancouver, B.C.

<u>Nature of work:</u>	<u>Date:</u>	<u>Personnel:</u>
Geological Report	November 1967	P.H. Sevensma Ph.D.,P.Eng.
Airborne Survey	January 26, 1968	C. Waterton
Preparation of Geophysical report	February 15th, 1968	P.H. Sevensma, Ph.D.,P.Eng. & H.S. Aikins

APPENDIX "B"

Statement of Costs: Quiet Lake Property

(1) Geological Report:

Consulting Fees and Expenses
(Nov. 22/67 invoice) \$ 780.00

(2) Geophysical Report:

A. Preliminary Studies \$ 377.50
B. Contract Services \$ 1526.00
C. Preparation of Report \$ 520.00 \$ 2,423.50

Total Cost of these studies \$ 3,203.50

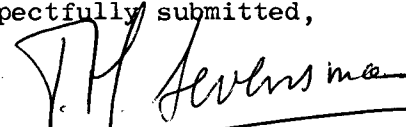
see cover

CERTIFICATE

I. PETER H. SEVENSMA, of Vancouver, B.C. do hereby certify that:

1. I am a graduate of the University of Geneva, Switzerland, (Physics and Chemistry, 1937; Geology and Mineralogy, 1937) where I obtained my Ph.D. in Geological and Mineralogical Sciences in 1941.
2. I am a Consulting Geological Engineer and a registered member in good standing of the Association of Professional Engineers of British Columbia and of the Association of Professional Engineers of Yukon Territory.
3. From February 1948 until December 1965 I have been engaged continuously in mining and exploration geology in the employ of Cominco Limited. As a Senior Exploration Geologist, I have worked extensively both in Eastern and Western Canada.
4. I have personally examined the claims which are the subject of this report as well as a number of other showings in the general area.
5. I have not received, nor do I expect to receive or acquire, directly or indirectly, any interest in any of the properties or securities of Trans Yukon Exploration Ltd.


Respectfully submitted,



P.H. Sevensma, Ph.D., P.Eng.

February 20, 1968
Vancouver, B.C.



LEGEND

Area covered by Airborne Survey. 

Claim held as at Jan. 26, 1968. 

LINDSAY GROUP

Trans Yukon Exploration Ltd.
Whitehorse M.D.-Y.T.

P. H. Sevensma Consultants Ltd. — Vancouver B.C.

Feb 1968, 105-C-14,


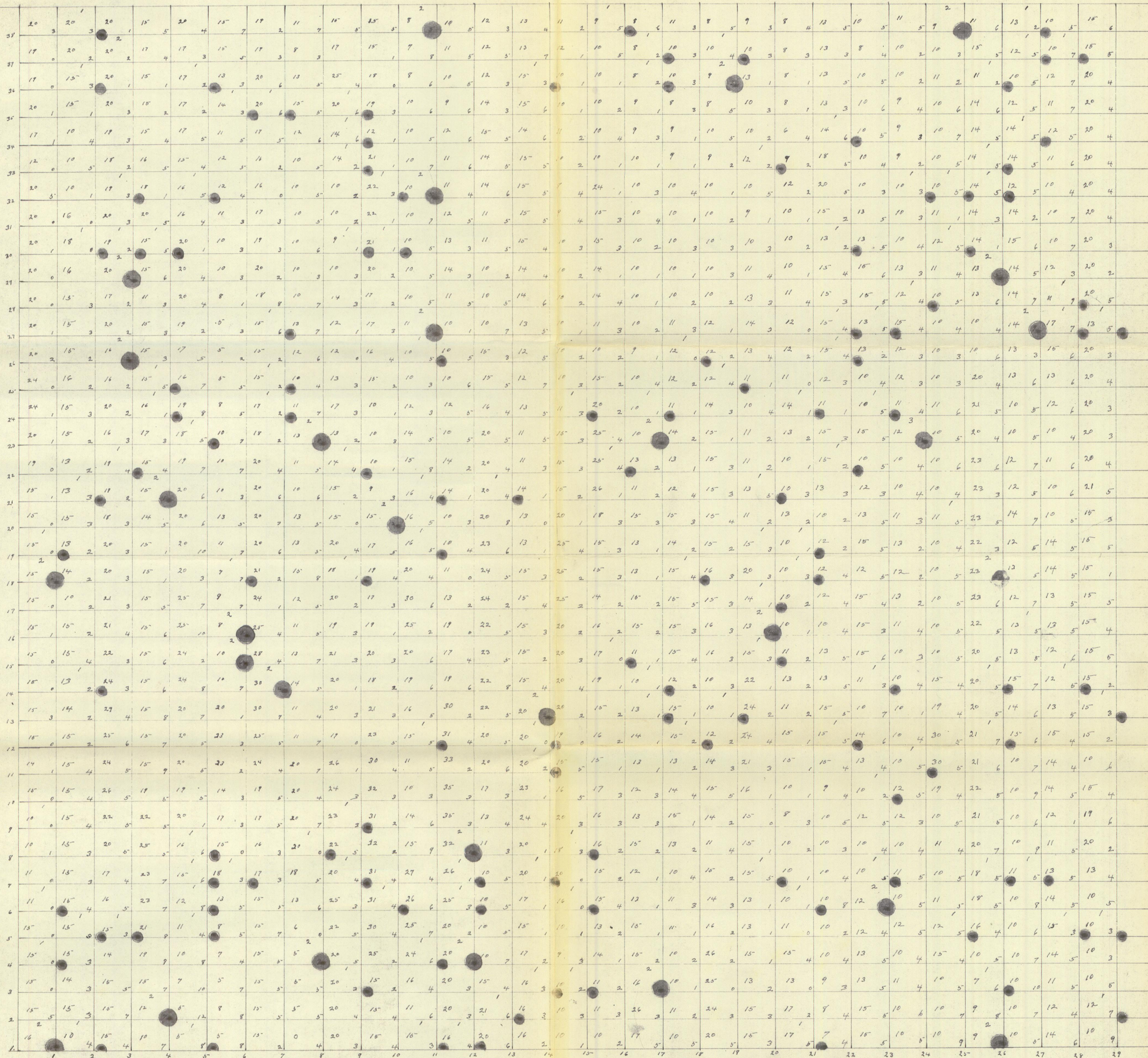
SCALE  1 Mile

FIG. 1



2
 3
 ELECTROMAGNETIC
 RADIOACTIVITY IN UNITS OF .001 MA/HR.
 MAGNETOMETER UNITS OF 100 GAMMAS

AIRBORNE GEOPHYSICAL RECONNAISSANCE LINDSAY GROUP YUKON JANUARY 26, 1968
 GRID SCALE: 1000 FEET TO 1 INCH
 CANADA PAT. NO. 758308 (1967)

0.002 MA/HR. RADIOACTIVITY

WATERTON AERONAUTICS & EXPLORATIONS LTD. Fig 2

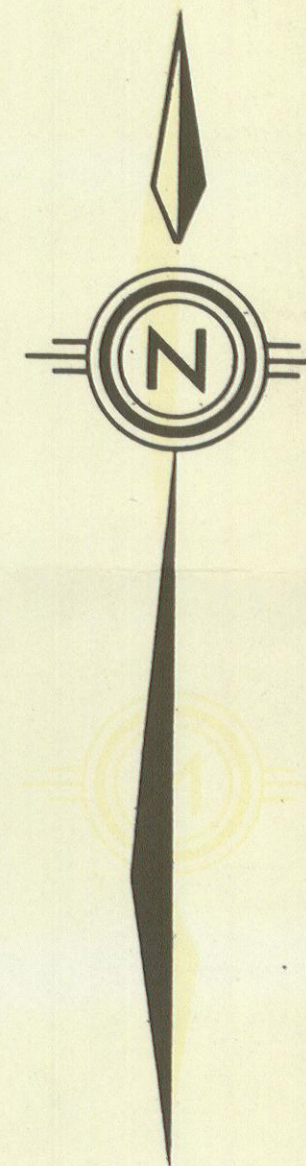
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Baseline

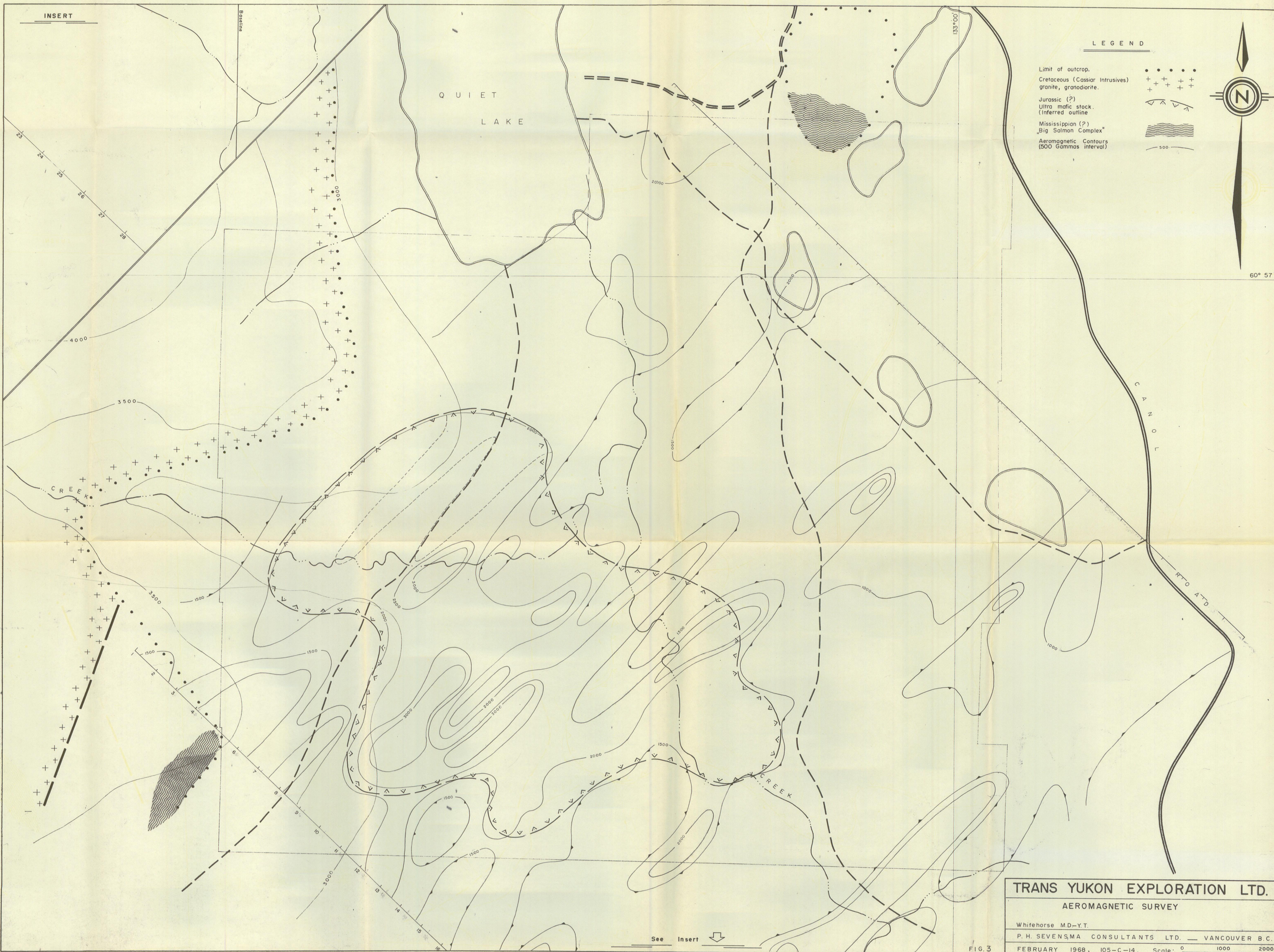
QUIET
LAKE

LEGEND

- Limit of outcrop.
- Cretaceous (Cassiar Intrusives) granite, granodiorite.
- Jurassic (?) Ultra mafic stock. (Inferred outline)
- Mississippian (?) "Big Salmon Complex"
- Aeromagnetic Contours (500 Gammas interval)



60° 57'



TRANS YUKON EXPLORATION LTD.
AEROMAGNETIC SURVEY

Whitehorse MD-Y.T.
 P. H. SEVENŠMA CONSULTANTS LTD. — VANCOUVER B.C.
 FEBRUARY 1968, 105-C-14, Scale: 0 1000 2000

FIG. 3

See Insert

INSERT

Baseline

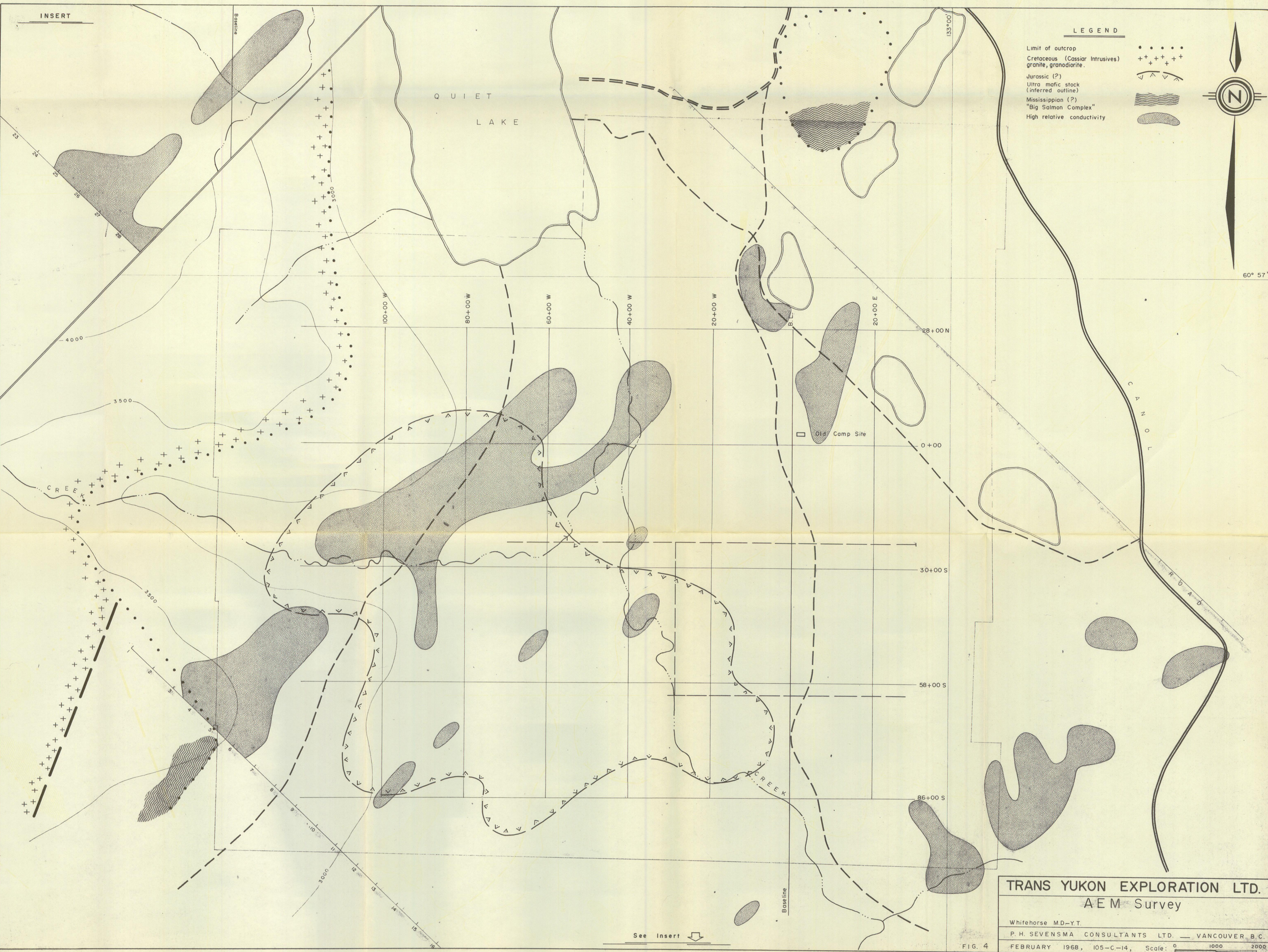
QUIET
LAKE

LEGEND

- Limit of outcrop
- Cretaceous (Cassiar Intrusives) granite, granodiorite
- Jurassic (?)
- Ultra mafic stock (inferred outline)
- Mississippian (?)
- "Big Salmon Complex"
- High relative conductivity



60° 57'

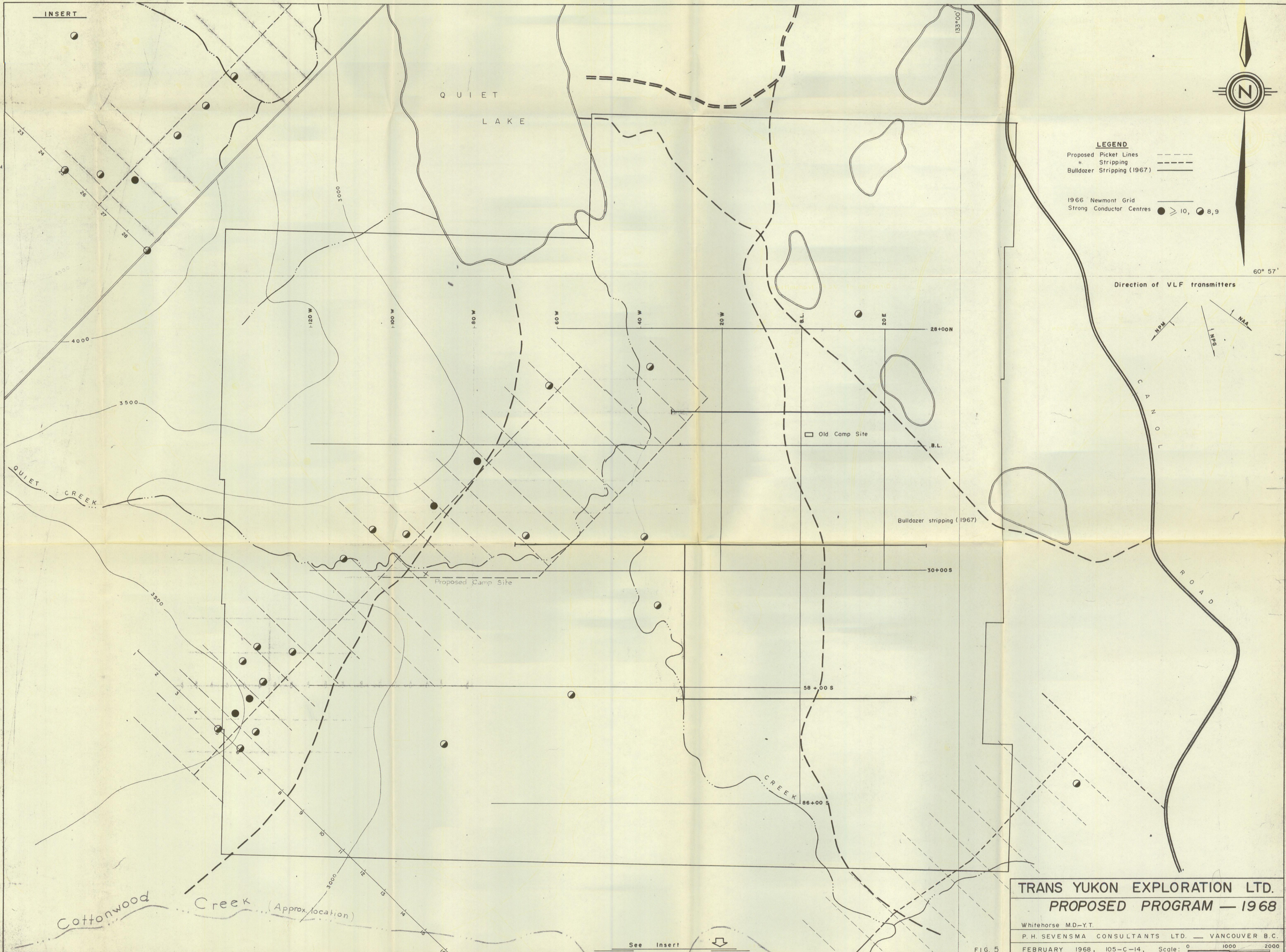


TRANS YUKON EXPLORATION LTD.
AEM Survey

Whitehorse M.D.-Y.T.
 P. H. SEVENSMA CONSULTANTS LTD. — VANCOUVER B.C.
 FEBRUARY 1968, 105-C-14, Scale: 0 1000 2000

FIG. 4

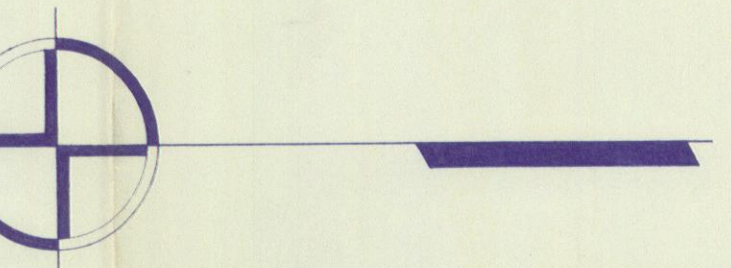
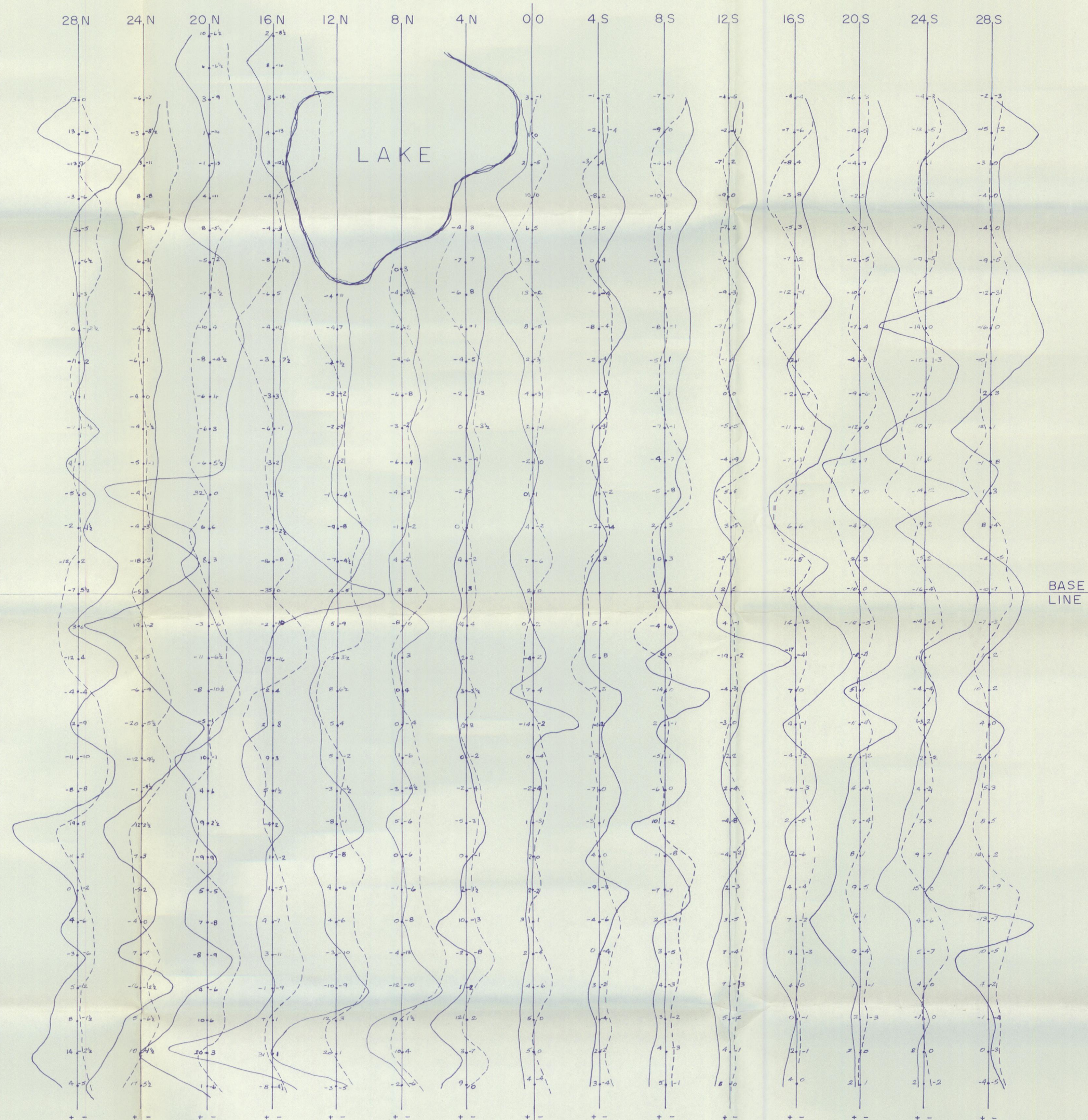
See insert



TRANS YUKON EXPLORATION LTD.
PROPOSED PROGRAM — 1968

Whitehorse MD-Y.T.
 P. H. SEVENEMA CONSULTANTS LTD. — VANCOUVER B.C.
 FEBRUARY 1968, 105-C-14, Scale: 0 1000 2000

FIG. 5



ATLAS EXPLORATIONS LTD.
 GROUND ELECTROMAGNETIC SURVEY
 VALUES AND PROFILES

J. LINDSAY PROPERTY
 QUIET LAKE AREA (Y.T.)

INSTRUMENT : RONKA EM 16
 OPERATORS : R. VOGWILL, V. PRATIOU.
 DATE DRAWN : AUGUST 1967
 DRAWN BY : R. VOGWILL.

SCALE : 1" = 400'
 1/10" = 2% RES. IN DIP ANGLE

ALL READINGS TAKEN FACING TOWARDS N 70° E