52G14SE0012 52G/14SE-79 VALORA LAKE

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BEIDELMAN BAY PROPERTY

SOUTHWEST STURGEON LAKE AREA

PATRICIA MINING DIVISION

ONTARIO

S.J. Carryer, L.B. Staines,
Geologists,
Exploration Department,
Steep Rock Iron Mines Ltd.

October 1967
Steep Rock Lake, Ontario.

INDEX

BEIDELMAN BAY PROPERTY

SOUTHWEST STURGEON LAKE AREA

PATRICIA MINING DIVISION

SUMMARY AND CONCLUSIONS

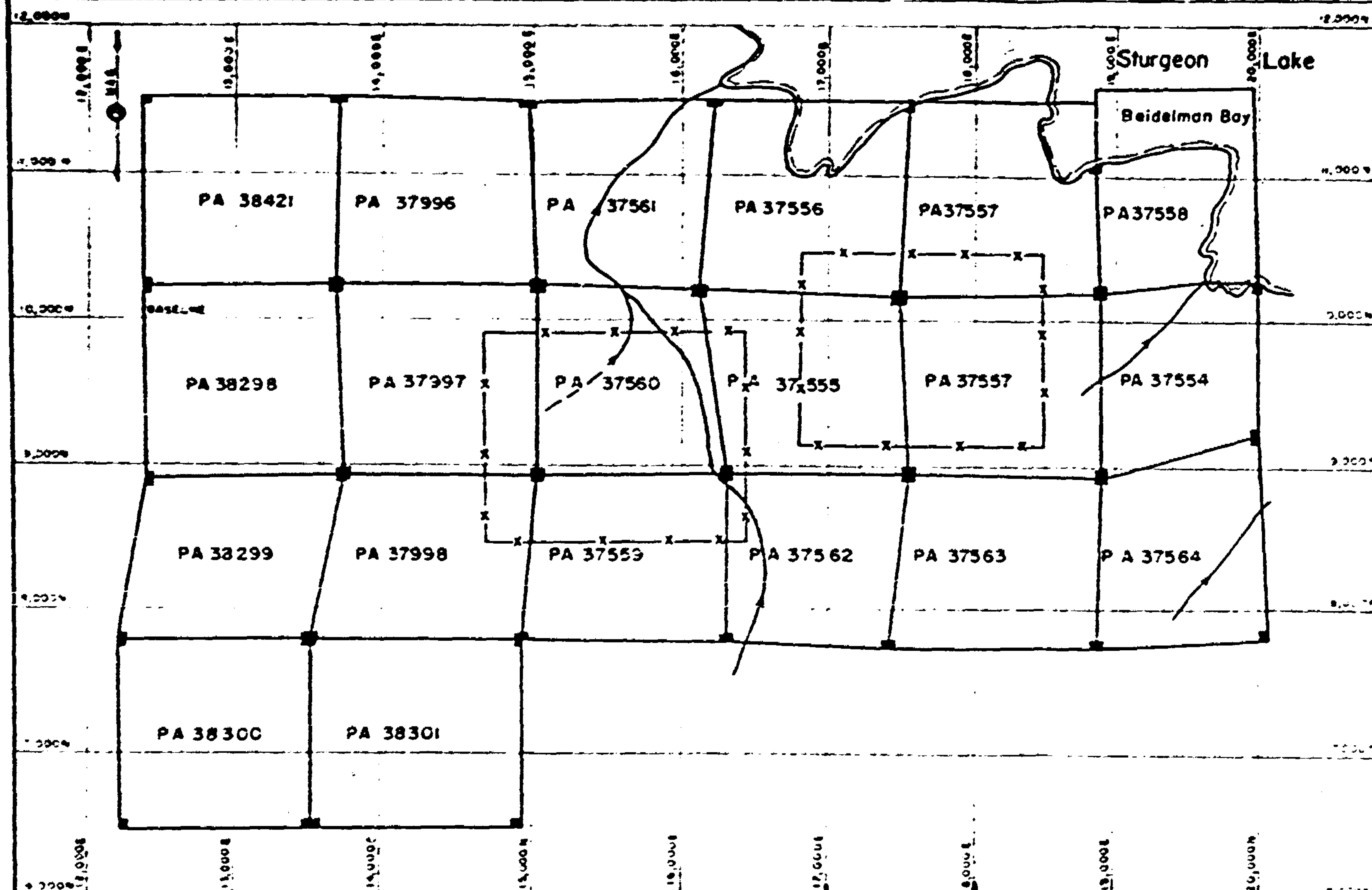
A programme of geological, geophysical and geochemical surveying, trenching and diamond drilling was carried out on the twenty claim property between July 1966 and August 1967.

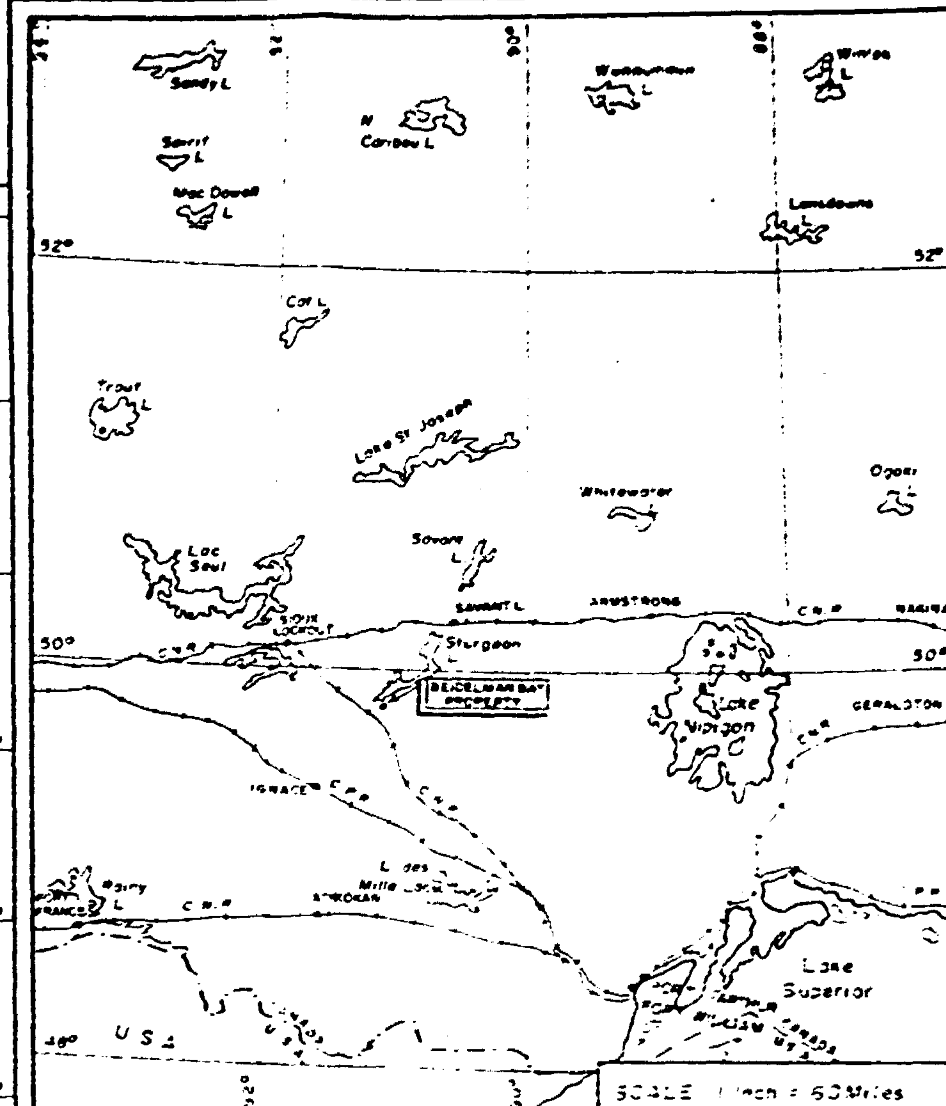
Two areas of disseminated copper mineralization designated as the Eastern and Western Areas were located. These areas were explored by detailed surveys and diamond drilling. No potential orebodies were located by this work.

The property is being held pending developments in this area.

RECOMMENDATIONS

If Steep Rock Iron Mines contemplates larger size drilling in the vicinity of this property then consideration should be given to deeper investigation in the Western Area. In particular the area about 92 - 94N on line 160E may warrant exploration to a greater depth than has now been investigated.





LEGEND

Lake Shore

Creek

Claim Lines with Claim Post

Areas of Detailed Investigation

N.T.S. REFERENCE 52-G/13

STEEP ROCK IRON MINES LIMITED

BEIDELMAN BAY PROPERTY, STURGEON LAKE, PATRICIA MIN. DIV.

LOCATION PLAN

DATE: December, 1967

SCALES: As shown

INTRODUCTION

An occurrence of chalcopyrite mineralization in the granite cropping out southwest of Beidelman Bay, Sturgeon Lake (N.T.S. Ref. 52-O-14) was discovered in June 1966 by the company employed prospector J. Gareau. During the summer of 1966, fifteen claims were staked in the area. During the winter of 1966 - 67 five further claims were staked to the west and southwest of the original group.

The claims are numbered Pa. 37553 - Pa. 37564 inclusive; Pa. 37996 - Pa. 37998 inclusive; Pa. 38298 - Pa. 39301 inclusive; and Pa. 38421. All claims except Pa. 38421 have been transferred to Steerola Explorations Limited.

Between July 1966 and August 1967 Steep Rock Iron Mines cut lines and conducted geological, geochemical, magnetometer, induced polarization and self potential surveys on the property. Trenching and diamond drilling was carried out within the two zones of sulphide mineralization delineated by these surveys.

The geological survey and initial trenching indicated that the mineralization was of widespread disseminated chalcopyrite in association with iron sulphides and minor molybdenite. No high grade concentrations of the minerals were located; consequently the exploration programme was aimed at locating a large low grade mineralized body.

Location and Access

The property extends south from the southwestern shore of Beidelman Bay, Sturgeon Lake (see location map). This area is covered by Ontario Department Mines Plan M-2266, Southwest Part of Sturgeon Lake, Patricia Mining Division, District of Kenora.

Highway 599 passes two miles west of the property and access by boat is possible from the several tourist lodges along the west shore of the lake. The old Darkwater Mine road from Valora which passes through the property is still negotiable by tractor. Sturgeon Lake provides unlimited landing for float planes but northeasterly winds often make the water too rough for landing.

Topography and Vegetation

Areas of gently to steeply undulating terrain are surrounded by flat low lying areas. These flat areas are characteristically swampy but in the northwest are often dry.

Apart from the swampy areas the forest cover is predominantly of mixed spruce and birch. For the main part the swamps support a growth of stunted spruce but in the wetter areas cedars with a dense alder undergrowth predominate.

Beaver exist in some of the bays and also in the lower part of the main swamp. These as well as game animals do not appear to be common in the area.

PREVIOUS WORK

Mapping by the Ontario Department of Mines in the area south of Beidelman Bay is reported by Graham (1930). He records outcroppings of a pink quartzose granite showing alterations of minor biotite to chlorite and introduction of black tourmaline.

No work has been recorded on previous claims staked in the area. However, Elliott (1965) notes that magnetometer and electromagnetic surveys have been conducted in what is now the Western Area of the Steerola claim group. A base line with cross lines at 200 foot intervals along which these surveys were probably conducted have been located.

During the geological survey a number of old trenches were found in the above area and in the northeastern corner of the group. The majority of these trenches expose quartz veins but five of them were put down in rock containing sulphide mineralization. Sites of two diamond drill holes were also located in the Western Area.

FIELD PROCEDURE

Linecutting

A base line was established by transit survey and chaining due west across the property. North-south lines perpendicular to this base line were cut at 400 foot intervals ind extended to the property boundaries. A transit survey along these boundaries established the deviation of the picket lines from the grid.

The baseline was assigned a latitude of 10,000N and pickets were marked at 100 foot chained intervals along the cross lines. Departures were assigned by establishing the eastern property boundary as 20,000E.

Intermediate north-south lines and some transverse drill section lines were later added to this grid.

After freeze-up the lines terminating at the lake shore were extended across the ice to the property boundary.

The linecutting completed is as follows:-

Cut and chained lines	11.99 miles
Boundary lines surveyed	2.12 miles
Lines chained on ice	0.69 miles
Total	14.80 miles

Geological Survey

Bed rock exposures were plotted on the grid from pace and compass measurement to the cut lines. Geological observations made during the initial survey covering the fifteen claim group have been recorded on a 1 inch = 200 foot scale plan (see Geological Plan). Detailed geological mapping in the two mineralized areas (see Location Map) are shown on two plans at a scale of 1 inch = 50 feet (see Detailed Geology, Western and Eastern areas). Where possible these observations of detail have also been recorded on the 1 inch = 200 feet scale plan.

Geochemical Survey

Observations of soil type and ground slope were made at 100 foot intervals along the north-south cut lines. Wherever present, samples of the B and C horizons of the glacially deposited or residual soils were taken. Samples were taken from as deep as possible in the horizon. Intermediate samples were taken in some places to check anomalous results. Soils derived from water laid sands were not sampled.

All samples were dried and sieved through 80 mesh screen. A cold analysis for Total Heavy Metals was made by the dithizone method. A further analysis for copper was made by Technical Services Limited using Hot Hydrachloric Acid extraction.

Results have been plotted on a plan of the property of scale 1 inch = 200 feet (see Geochemical Plan).

Magnetometer Survey

Measurements of the intensity of the vertical magnetic field were taken with a Sharpe Fluxgate magnetometer at 100 foot intervals along the base line and at 50 foot intervals along the cross lines. Where differences of more than 2000 gammas were noted between consecutive readings intermediate stations were established. To compensate for diurnal variation a base station was established at 196E on the base line and check readings made at this point at least three times daily during the survey.

In areas which were found to be anomalous intermediate lines were run to detail these anomalies (see Magnetometer Survey Plan). Two plans have been drawn to facilitate interpretation. Both are of scale 1 inch = 200 feet and show respectively the corrected gamma values for each station and the contours drawn from these values (see Magnetometer Survey Plan and Magnetometer Contour Plan).

Electromagnetic Survey

A Crone J.E.M. unit was used to check the I.P. and magnetic anomalies. Readings were taken at 50 foot intervals with 100 foot spacing between coils.

Induced Polarization Survey

A contract was let to McPhar Geophysics Limited to survey the property along the cut lines. The survey was carried out during January

1967 but was not completed due to weather and equipment problems. Results of this survey are presented in a separate report by the contractor (see Appendix I).

Self Potential Survey

A Sharpe VP-6 voltmeter was used to survey the two mineralised areas. A reconnaissance survey was also carried out on other parts of the property to check I.P. and magnetic anomalies.

In both cases a 400 foot reel of wire was used in a continuous traverse. Overlap between set-ups enabled corrections to be made to reduce errors. Within the mineralised areas a further check was made by closing traverses wherever possible. Readings were taken at 25 foot or 50 foot intervals depending on the relief of the self potential field.

Results for the mineralized areas have been plotted and contoured on plans at a scale of 1 inch = 50 feet. The reconnaissance traverses have been shown graphically at scales of 1 inch = 100 feet; 1 inch = 50 millivolts (see Self Potenti l Reconnaissance Plan).

Trenching

Within the Eastern Area a series of trenches were dug through the overburden to bedrock. After blasting to unweathered rock continuous channel samples were taken along each trench and the geology mapped in detail. Southeast of these trenches a number of 2 foot holes were drilled in the outcrops and blasted. Samples of the unweathered rock were taken from each hole and details of the geology noted. Analyses of the samples were made by Bell White Analytical Laboratories. The results of this work is recorded in Appendix II and shown on the Trenching Plan at a scale of 1 inch = 20 feet.

In the western area one trench 21 feet long was dug and sampled as above. Results are recorded in Appendix II. To facilitate the geological mapping of the area shallow holes were also blasted in 52 of the bedrock exposures.

Diamond Drilling

Eighteen holes totalling 2,165 feet of XRP3 (7/8") diamond drilling was done with the company owned drill. These holes were drilled to investigate the observed mineralization and the geophysical anomalies.

Core containing chalcopyrite mineralization was devided into samples of approximately 10 feet each. Analyses for copper and molybdenite were made by the Steep Rock Iron Mines' Laboratory. Assays for gold and silver and zinc analyses were carried out by Bell White Laboratories on some of the samples. One 30 element spectrographic analysis was done by Technical Service Laboratories on a weighted composite (10 grams per foot) from hole BB-6..

A portion of the pulps from all the samples is stored in the Exploration Department. Before the samples were made up, a 2 to 4 inch piece of core from each rock type intersected was taken from each hole. These representative samples have been labelled as to hole and footage and are stored with the pulps. Core which was considered unworthy of analysis was left at the drill site.

Core recovery was generally better than 95% but schist and, in two holes, sulphide bands reduced this recovery for limited sections. Drill logs and sections are included as Appendix III. Drill collars and a projection of the hole to the horizontal are shown on the detailed geological plans. Co-ordinates for the holes were calculated from chain and compass measurements made along two lines tied to the cut and chained grid.

GEOLOGY

Table of Formations

Cenozoic

Overburden - Glacial till and outwash sands.

Major Unconformity

Precambrian

Basic Intrusives - Dark schist and chlorite schist, diorite quartz diorite

Intrusive Contact

Acid Intrusives

Altered rocks - silicified and blue quartz eye granite sericitized granite

Unaltered Rocks

Feldspar granite
Quartz feldspar and feldspar porphyry
Granite
Granodiorite

Intrusive Contact

Granitized Greenstone - Breccia - granitized greenstone breccia.

Rock Descriptions

Breccia - a fine grained grey intermediate rock usually brecciated into angular or rounded pieces with inclusions and fragments of quartz diorite and the acid intrusive rocks. The size of the fragments range from 1/4 inch to several feet in diameter.

This rock is interpreted as being a brecciated granitized product of the intrusion of an acid pluton into a sequence of greenstone rocks.

Feldspar Porphyry - a fine grained dark grey rock with a varying percentage of medium to coarse grained (to 8 mm) phenocrysts and usually with some similar sized quartz phenocrysts. The ground mass contains minor tourmaline and pyrite and is often chloritic.

When the rock contains more than 10% quartz phenocrysts it is termed Quartz Feldspar Porphyry.

Granite - a grey or pale pink medium to coarse grained granite usually containing minor tourmaline biotite and pyrite. The biotite is often altered to chlorite. Minor compositional changes within this rock have produced Granodior te by increase in the mafic mineral content and elimination of pink feldspar.

Feldspar Granite - a medium to fine grained white granitic rock composed largely of white feldspar. Typically this rock contains blebs of chlorite. It occurs as bands within the granite.

Silicified Granite - a medium to coarse grained grey granitic rock which has been altered by moderate secondary silicification.

Blue Quartz Eye Granite - a medium to coarse grained grey granitic rock containing coarse grained (to 10 mm) porphroblasts of blue quartz.

It is probable that the silicified granite and blue quartz eye granite are related in that they are products of increasing silicification in the granite.

Sericitized Granite - a medium to coarse grained granitic rock in which sericite has replaced all of the mafic minerals, much of the feldspar and has eroded the quartz grains. This rock is probably an alteration product of the granite, silicified granite and blue quartz eye granite.

<u>Quartz Diorite</u> - a dark grey medium to fine grained rock containing medium grained (to 4 mm) phenocrysts of quartz. This rock is often granitic in texture.

<u>Diorite</u> - a black fine grained rock with fine and medium grained (to 3 mm) phenocrysts of white feldspar.

<u>Dark Schist</u> - a fine grained well foliated black rock. Separation of the mafic (hornblende and biotite) and felsic minerals into bands is often present. Alteration of the mafic minerals to chlorite has in some places produced <u>Chlorite Schist</u>.

<u>Structure</u>

The claim group is underlain largely by the granitic rocks which form part of an acid pluton. In the Western Area a remnant of greenstone is exposed. Brecciation and granitization of this rock has taken place; the structural relationship of this remnant to other greenstones in the area has not been determined.

The acid stock, fairly uniform in composition, crystallized as two texturally different components; the granite and the porphyries. Faulting and intense shearing is common along a predominantly northeast-southwest direction. These dislocations have been the mechanism by which the granite and porphyry have been brought into direct contact.

Contacts between the granite, silicified granite, blue quartz eye granite and sericitized granite are usually gradational.

The feldspar granite occurs as intrusive bands within the granite and probably formed from migrating feldspar rich solutions late in the sequence of crystallization.

The apparent northwest-southeast offset in the breccia exposed in the Western Area may be due to faulting but no evidence of associated shearing in this direction was observed.

Quartz veins following many of the more intense shear zones and faults indicate a second stage of silicification. This silicification is restricted to vein deposits.

ECONOMIC GEOLOGY

The initial geological survey indicated two zones of widespread disseminated chalcopyrite mineralization which were considered worthy of detailed investigation. Coincident I.P. , magnetometer and S.P. anomalies further delineated these zones. The widespread mineralization and the absence of high grade concentrations (less than 1% Cu) suggested that the exploration programme should be aimed at finding a low grade, large tonnage body which could be mined by open pit methods.

As none of the geophysical anomalies extended into the swamp separating the zones it is considered by the writers unlikely that rocks of economic interest crop out between them.

Eastern Area

This area lies mainly in the northwestern corner of claim Pa. 37553 and extends into the northeastern corner of claim Pa. 37555.

The silicified granite in this area often contains moderate sulphide mineralization. Pyrite and chalcopyrite are generally present, pyrrhotite is prominent locally.

In the unaltered granite surrounding the zone of silicification local concentrations of magnetite, pyrite, chalcopyrite and rarely pyrrhotite were observed. These minerals occur separately or in association (see Detailed Geological Plan).

One zone of economically interesting mineralization was observed. Diamond drill hole BB-1 intersected 48 feet averaging 0.58% Cu and diamond drill hole BB-2, 55 feet below, intersected 36 feet analysing 0.43% Cu. Trenching on strike to the east and hole BB-6 to the west show that this zone is too small to be of economic interest.

Generally the mineralized rock and core samples analysed contained about 0.2% Cu and less than 0.02% MoS_2. No gold or silver values of economic interest were found.

Western Area

This area lies in the southern portion of claim Pa.37560 and the northern part of Pa.37559. A zone of sulphide mineralization is associated with a 500 foot wide zone of silicified granite which strikes about N70°E. This zone has a gradational contact with the unaltered granite to the north and an intrusive contact with the older breccia to the south.

The mineralization consisting of pyrrhotite, pyrite and chalcopyrite with very minor molybdenite and rarely bornite is disseminated in the granite. Some sulphide occurs in the porphyry bands within the granite but is generally associated with the pervasive silicification in the granite and the older breccia, especially near their common contact. Later stage silicification in the form of narrow discontinuous irregular quartz stringers has some associated pyrrhotite, chalcopyrite, pyrite and molybdenite.

One sample across 5 feet of the trench analysed 0.60% Cu. The average for the 21 feet sampled was only 0.36% Cu. Diamond drill hole BB-12 intersected 21 feet of rock analysing 0.61% Cu including 5 feet of chlorite schist analysing 1.34% Cu. Diamond drill hole BB-15 intersected a zone of sericitized granites which analysed 0.51% Cu across 16 feet 7 inches. No other samples from this area analysed more than 0.5% Cu.

No economic concentrations of recoverable minerals of any significant volume were observed or indicated. This work does not, however, preclude the possibility of economic concentrations at greater depth.

EXPLORATION RESULTS

Geophysical Surveys

The induced polarization survey indicated "definite" anomalies on lines 152E, 156E, 160E and 172E (see Dwg. Misc. 4288, Appendix I). Numerous "possible" and "probable" anomalies were also located but after checking with S.P. (see S.P. Reconnaissance Plan) and comparison of the drilling results from the "definite" anomalies these I.P. anomalies were considered unworthy of further investigation.

The magnetometer survey indicated two strongly magnetic zones roughly coincident with the "definite" I.P. anomalies in the Western Area (see Geophysical Composite Plan). A number of smaller and more weakly anomalous zones were also located (see Magnetometer Contour Plan).

The Self Potential Surveys carried out in the Eastern and Western Areas indicated a number of moderate anomalies. In the Western Area the strongest anomaly (-300 Mv) occurs in the vicinity of the I.P. and magnetometer anomalies on line 160E (see Geophysical Composite Plan) with two weaker peaks (-200 Mv) in the adjacent area.

In the Eastern area an anomaly (-200 Mv) was located coinciding with the magnetic and I.P. anomalies on line 172E.

The E.M. survey did not indicate any conductors in the areas investigated.

Geochemical Survey

Results of the samples analysed (see Table I) were subjected to the standard statistical tests for recognition of anomalous values (Hawkes and Webb 1962). As the results for this property do not react satisfactorily to these tests other statistical tests were tried (Moroney 1951) without success. The writer suggests that within the area of this property geochemical anomalies can best be recognised by direct observation of the results plotted on a plan (see Geochemical Sample Plan).

The locations of the anomalous samples so recognized are on or close to exposures of rock containing copper mineralization. One exception is at 85 to 86N on line 156E but although these samples were decidedly anomalous (350, 227, 475 ppm Cu) they occur within a 100 foot wide area and could represent glacially transported mineralized float. The absence of geophysical anomalies in this area restricts the possibility that the anomalous samples are derived from mineralized outcrop.

Diamond Drilling

Eleven holes (BB-1 to 11) totalling 1392 feet were drilled to check the eastern zone of mineralization and the associated geophysical anomalies. Sufficient sulphide mineralization was found to explain these anomalies but as these minerals were largely pyrite and pyrrhotite with only minor chalcopyrite, the deposits are not of economic significance.

Six holes (BB-12 to 17) totalling 667 feet were drilled to investigate the western zone of mineralization and the associated geophysical anomalies. Again the pyrrhotite and other sulphide minerals present were in sufficient concentrations to explain the anomalies but were not of economic significance.

One hole (BB-18) was drilled to check the I.P. anomaly on line 152E. None of the core recovered contained sufficient mineral to explain this anomaly. Six feet of lost core (28' 2" to 34' 2") did produce considerable pyrite in the cuttings so that if this section represents a band of massive sulphides this could explain the anomaly.

REFERENCES

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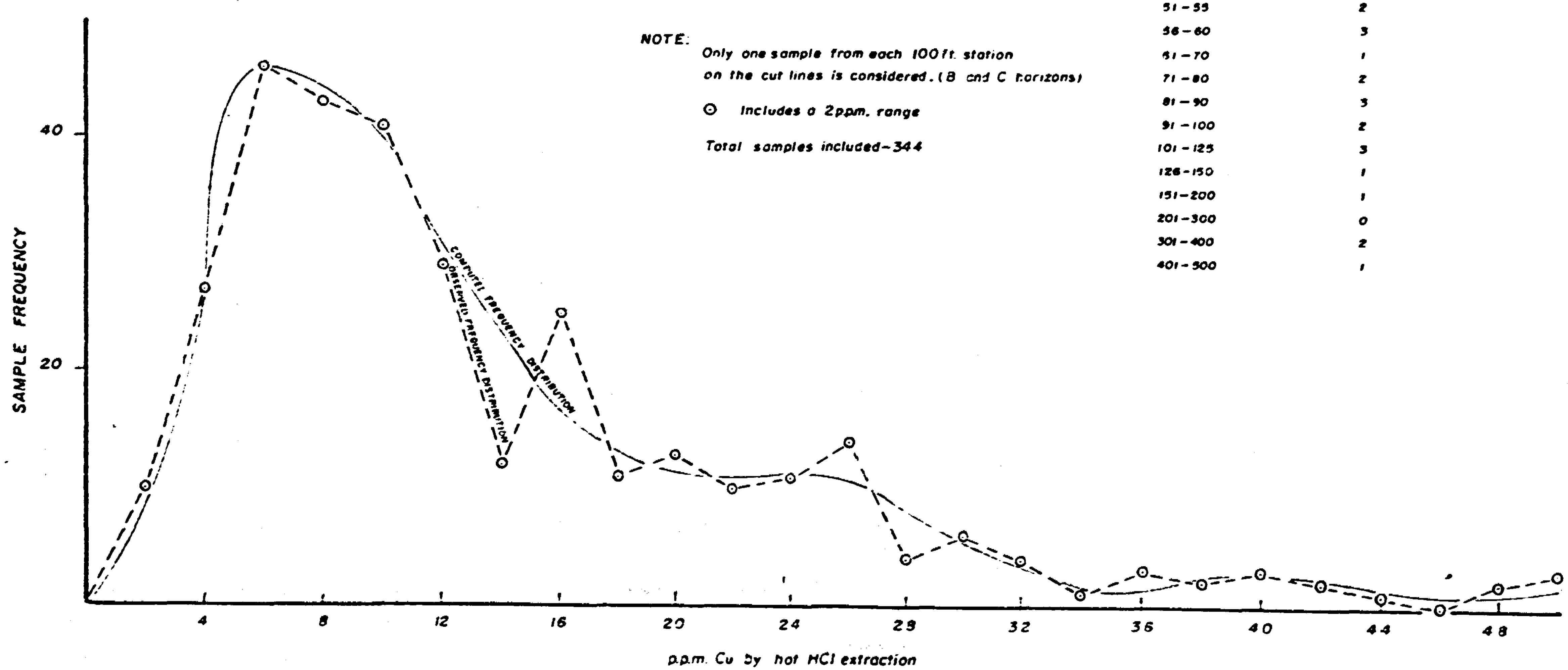
Geologists,
Exploration Department,
Steep Rock Iron Mines Ltd.

October 1967
Steep Rock Lake, Ontario.

TABLE 1 GRAPH OF GEOCHEMICAL SURVEY RESULTS



SAMPLES NOT SHOWN ON GRAPH

Interval ppm. Cu	Sample Frequence
51 – 55	2
56 – 60	3
61 – 70	1
71 – 80	2
81 – 90	3
91 – 100	2
101 – 125	3
126 – 150	1
151 – 200	1
201 – 300	0
301 – 400	2
401 – 500	1

S. J. CARRTER
NOVEMBER, 1967

APPENDIX I

McPHAR GEOPHYSICS LIMITED

REPORT ON

INDUCED POLARIZATION

AND RESISTIVITY SURVEY

ON THE

BEIDELMAN BAY PROPERTY

STURGEON LAKE AREA, ONTARIO

FOR

STEEP ROCK IRON MINES LTD.

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1. INTRODUCTION

At the request of Mr. W. G. Wahl, consultant for the Company, we have carried out a combined induced polarization-resistivity survey on a portion of the Beidelman Bay property on behalf of Steep Rock Iron Mines Limited. The property is situated at the southwest end of Sturgeon Lake in the Patricia Mining Division of northwestern Ontario.

According to information supplied by the Company, the property is largely underlain by granite although outcrops are scarce. Disseminated chalcopyrite and molybdenite have been found at several places in the central part of the grid. Four short holes were previously drilled near 100+00N on Line 176E but the results are not known to us. Apparently there is an extensive zone of disseminated chalcopyrite with minor pyrite and the purpose of the IP survey was to outline this zone.

North-south lines were run at 400 foot intervals using a 200 foot electrode separation and taking three readings (i. e. n = 1, 2 and 3.) In addition the line over the main showing was detailed using 100 foot electrode intervals. No strong anomalies were found; there are several weak but definite anomalies which appear to correlate from line to line and considering the nature of the known mineralization these are thought to be significant.

2. PRESENTATION OF RESULTS

The Induced Polarization and Resistivity results are shown on the following data plots in the manner described in the notes preceding this report.

Line 152E	200 foot spreads	Dwg. IP 2639-1
Line 156E	200 foot spreads	Dwg. IP 2639-2
Line 160E	200 foot spreads	Dwg. IP 2639-3
Line 164E	200 foot spreads	Dwg. IP 2639-4
Line 168E	200 foot spreads	Dwg. IP 2639-5
Line 172E	200 foot spreads	Dwg. IP 2639-6
Line 176E	200 foot spreads	Dwg. IP 2639-7
Line 176E	100 foot spreads	Dwg. IP 2639-8
Line 180E	200 foot spreads	Dwg. IP 2639-9
Line 196E	200 foot spreads	Dwg. IP 2639-10

Enclosed with this report is Dwg. Misc. 4266, a plan map of the grid at a scale of 1" = 200'. The definite and possible induced polarization anomalies are indicated by solid and broken bars respectively on this plan map as well as the data plots. These bars represent the surface projection of the anomalous zones as interpreted from the location of the transmitter and receiver electrodes when the anomalous values were measured.

Since the induced polarization measurement is essentially an averaging process, as are all potential methods, it is frequently difficult to exactly pinpoint the source of an anomaly. Certainly, no anomaly can be located with more accuracy than the spread length; i.e. when using 200' spreads the position of a narrow sulphide body can only be determined to lie between two stations 200' apart. In order to locate sources at some depth, larger spreads must be used, with a corresponding increase in the uncertainties of location. Therefore, while the center of the indicated anomaly probably corresponds fairly well with source, the length of the indicated anomaly along the line should not be taken to represent the exact edges of the anomalous material.

3. DISCUSSION OF RESULTS

The geophysical results are characterized by high resistivities and low background IP effects. On several parts of the grid considerable difficulty was encountered in making good contact with the ground, even with the use of brine around the current electrodes. This situation resulted in several delays and somewhat reduced progress of the survey. The field crew was additionally hampered by extremely cold weather.

No strong anomalies were encountered during the survey and in fact the test over the main showing gave only a very weak anomaly, even with 100 foot electrode intervals. Generally anomalies of this magnitude are not considered to be important but experience has shown that in some environments similar anomalies are of great significance. For example, the accompanying figure shows typical field results from a disseminated sulphide deposit in southern B. C. In this case the only metallic minerals are chalcopyrite, bornite and molybdenite. Even though they constitute less than 1.5% of the rock, the deposit is of definite economic interest.

Two rock specimens provided by the Company were tested in our laboratory for possible IP effects. One sample was a granite with several per cent magnetite and the second was granite with several per cent chalcopyrite. The magnetic sample gave a fairly high resistivity (1260) and a very low M. F. (2) whereas the copper bearing sample gave a low resistivity (100) and a moderately high M. F. (249). From this we would conclude that any extensive sulphide zone, comparable to the above specimen, would give rise to measurable IP effects.

__Line 152E__

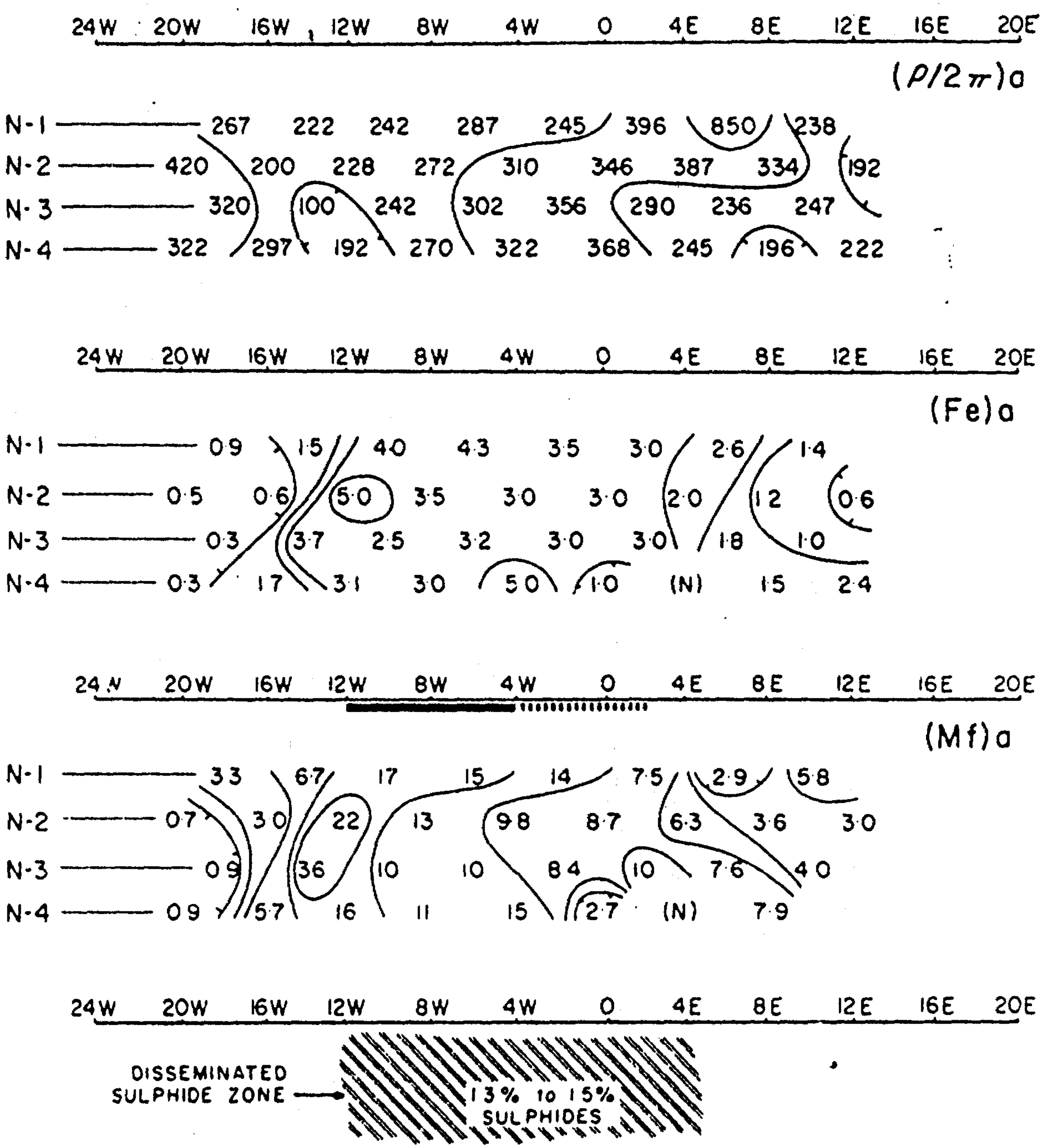
There is a definite anomaly, with some depth to the top, centered at 96N within a broad, weak zone extending from 98N to at least 92N. The anomaly is not strong but the magnitude is appreciably greater than that obtained over the showing on Line 176E. In addition there is a zone of very weak effects from 101N to 105N; this has been shown on the data plot and plan as a "possible" anomaly.

__Line 156E__

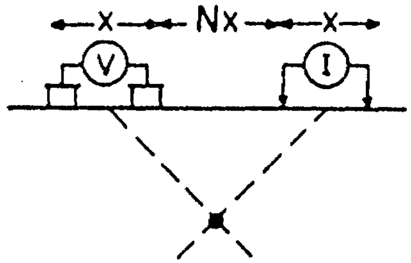
On this line there is a shallow, definite anomaly at 90N to 92N, with weaker extensions to about 89N and 95N. There are also

INDUCED POLARIZATION
AND
DRILLING RESULTS
FROM
BRENDA AREA
PEACHLAND, B.C.

LINE - 8S



FREQUENCIES - 0.31 & 5.0 CPS.



X EQUALS 400 FEET

possible shallow sources at 98N to 100N and 104N to 106N.

Line 160E

Here the definite anomaly is centered at 92N to 94N, with extensions to about 90N and 98N. This is the strongest anomaly on the grid and it seems to correlate with several copper occurrences.

Possible shallow, weak features are also present at 82N to 84N and 102N to 104N. These might be better evaluated with shorter electrode intervals.

Line 164E

The main anomaly is appreciably weaker on Line 164E. The results suggest a variable zone of above-background values from 84N to 104N, with minor increases at 84N to 86N and at 98N to 100N.

Line 168E

These results are similar to those on the preceding line.

Line 172E

A shallow, fairly definite anomaly occurs at 99N to 103N with a weaker extension well to the north. There is also a broad zone of above-background effects from 84N to 99N.

Line 176E

Using 200 foot electrode intervals there is only a possible weak anomaly over the showing at the Base Line. Similar or stronger effects were measured at 102N to 104N, 85N to [illegible] and 92N to 94N.

The latter feature may be in part caused by the telephone line although it did not seem to cause any interference on some of the other traverses.

Using 100 foot intervals there is a probable shallow anomaly at 99N to 101N, with a weaker extension to the south.

Line 180E

The data is incomplete on this traverse due to current electrode contact problems. The north half shows very low background IP effects and high resistivities. The low resistivity zone at 66N to 68N suggests the presence of an anomaly but the IP effects could not be measured accurately.

Line 196E

Only minor increases in the M.F. values were found on this line.

4. SUMMARY AND RECOMMENDATIONS

The test results over the showing on Line 176E gave only very weak effects using 200 foot intervals and a weak but recognizable anomaly using 100 foot intervals. This is generally the case when dealing with minor amounts of metallic minerals (i.e. less than 2%) in a tight or siliceous host rock. In special cases where the only metallic minerals are ore minerals, effects of this magnitude may be extremely important and hence there is justification for showing them as anomalies.

The distribution of anomalies on the accompanying plan indicates a well-defined zone extending from Line 176E to Line 152E, still open to the west. The strongest effects were measured on the three western lines so that if there is sufficient concentration of the ore minerals on Line 176E to be of economic interest, it seems reasonable to conclude that there is a greater volume and/or concentration on the western lines, particularly on Line 160E.

A second, but weaker, zone occurs on the south part of the grid from Line 164E to Line 160E.

A drill test should be carried out on the definite anomaly on Line 160E and if encouraging results are obtained the IP survey should be extended farther west.

McPHAR GEOPHYSICS LIMITED

Robert A. Bell.

Robert A. Bell,
Geologist.

Philip G. Hallof

Philip G. Hallof,
Geophysicist.

Dated: January 27, 1967

ASSESSMENT DETAILS

PROPERTY: Biedleman Bay — MINING DIVISION: Patricia

SPONSOR: Steep Rock Iron Mines Ltd. — PROVINCE: Ontario

LOCATION: Sturgeon Lake Area

TYPE OF SURVEY: Induced Polarization

OPERATING MAN DAYS:	47.5	DATE STARTED:	January 5, 1967
EQUIVALENT 8 HR. MAN DAYS:	71.5	DATE FINISHED:	January 21, 1967
CONSULTING MAN DAYS:	3	NUMBER OF STATIONS:	178
DRAUGHTING MAN DAYS:	7	NUMBER OF READINGS:	816
TOTAL MAN DAYS:	81.5	MILES OF LINE SURVEYED:	6.17

CONSULTANTS:
R. A. Bell, 50 Hemford Crescent, Don Mills, Ontario.
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R. Foster, 12 Pleasant Street, Livermore Falls, Maine, U.S.A.

3 Helpers - supplied by client

DRAUGHTSMEN:
E. Helkio, 102 Goodwood Park Court, Apt. 706, Toronto 13, Ontario.
S. Woods, Apt. 401, 1222 York Mills Road, Don Mills, Ontario.
N. Lade, Apt. 503, 35 Esterbrooke Ave., Willowdale, Ontario.

McPHAR GEOPHYSICS LIMITED

Robert A. Bell,
Geologist.

Dated: April 3, 1967

REPORT ON
INDUCED POLARIZATION
AND RESISTIVITY SURVEY
ON THE
BEIDELMAN BAY PROPERTY
STURGEON LAKE AREA, ONTARIO
FOR
STEEP ROCK IRON MINES LTD.

McPHAR GEOPHYSICS LIMITED

NOTES ON THE THEORY OF INDUCED POLARIZATION AND THE METHOD OF FIELD OPERATION

Induced Polarization as a geophysical measurement refers to the blocking action or polarization of metallic or electronic conductors in a medium of ionic solution conduction.

This electro-chemical phenomenon occurs wherever electrical current is passed through an area which contains metallic minerals such as base metal sulphides. Normally, when current is passed through the ground, as in resistivity measurements, all of the conduction takes place through ions present in the water content of the rock, or soil, i.e. by ionic conduction. This is because almost all minerals have a much higher specific resistivity than ground water. The group of minerals commonly described as "metallic", however, have specific resistivities much lower than ground waters. The induced polarization effect takes place at those interfaces where the mode of conduction changes from ionic in the solutions filling the interstices of the rock to electronic in the metallic minerals present in the rock.

The blocking action or induced polarization mentioned above, which depends upon the chemical energies necessary to allow the ions to give up or receive electrons from the metallic surface, increases with the time that a d.c. current is allowed to flow through the rock; i.e. as ions pile up against the metallic interface the resistance to current flow increases. Eventually, there is enough polarization in the form of excess ions at the interfaces to effectively stop all current flow through the metallic particle. This polarization takes place at each of the infinite number of solution-metal interfaces in a mineralized rock.

When the d.c. voltage used to create this d.c. current flow is cut off, the Coulomb forces between the charged ions forming the polarization cause them to return to their normal position. This movement of charge creates a small current flow which can be measured on the surface of the ground as a decaying potential difference.

From an alternate viewpoint it can be seen that if the direction of the current through the system is reversed repeatedly before the polarization occurs, the effective resistivity of the system as a whole will change as the frequency of the switching is changed. This is a consequence of the fact that the amount of current flowing through each metallic interface depends upon the length of time that current has been passing through it in one direction.

The values of the "metal factor" or "M.F." are a measure of the amount of polarization present in the rock mass being surveyed. This parameter has been found to be very successful in mapping areas of sulphide mineralization, even those in which all other geophysical methods have been unsuccessful. The induced polarization measurement is more sensitive to sulphide content than other electrical measurements because it is much more dependent upon the sulphide content. As the sulphide content of a rock is increased, the "metal factor" of the rock increases much more rapidly than the resistivity decreases.

Because of this increased sensitivity, it is possible to locate and outline zones of less than 10% sulphides that can't be located by E. M. Methods. The method has been successful in locating the disseminated "porphyry copper" type mineralization in the Southwestern United States.

Measurements and experiments also indicate that it should be possible to locate most massive sulphide bodies at a greater depth with induced polarization than with E. M.

Since there is no I. P. effect from any conductor unless it is metallic, the method is useful in checking E. M. anomalies that are suspected of being due to water filled shear zones or other ionic conductors. There is also no effect from conductive overburden, which frequently confuses E. M. results. It would appear from scale model experiments and calculations that the apparent metal factors measured over a mineralized zone are larger if the material overlying the zone is of low resistivity.

Apropos of this, it should be stated that the induced polarization measurements indicate the total amount of metallic constituents in the rock. Thus all of the metallic minerals in the rock, such as pyrite, as well as the ore minerals chalcopyrite, chalcocite, galena, etc. are responsible for the induced polarization effect. Some oxides such as magnetite, pyrolusite, chromite, and some forms of hematite also conduct by electrons and are metallic. All of the metallic minerals in the rock will contribute to the induced polarization effect measured on the surface.

In the field procedure, measurements on the surface are made in a way that allows the effects of lateral changes in the properties of the ground to be separated from the effects of vertical changes in the properties. Current is applied to the ground at two points a distance (X) apart. The potentials are measured at two other points (X) feet apart, in line with the current electrodes. The distance between the nearest current and potential electrodes is an integer number (N) times the basic distance (X).

The measurements are made along a surveyed line, with a constant distance (NX) between the nearest current and potential electrodes. In most surveys, several traverses are made with various values of (N); i. e. (N) = 1, 2, 3, 4, etc. The kind of survey required (detailed or reconnaissance) decides the number of values of (N) used.

In plotting the results, the values of the apparent resistivity and the apparent metal factor measured for each set of electrode positions are plotted at the intersection of grid lines, one from the center point of the current electrodes and the other from the center point of the potential electrodes. The resistivity values are plotted above the line and the metal factor values below. The lateral displacement of a given value is determined by the location along the survey line of the center point between the current and potential electrodes. The distance of the value from the line is determined by the distance (NX) between the current and potential electrodes when the measurement was made.

The separation between sender and receiver electrodes is only one factor which determines the depth to which the ground is being sampled in any particular measurement. These plots then, when contoured, are not section maps of the electrical properties of the ground under the survey line. The interpretation of the results from any given survey must be carried out using the combined experience gained from field, model and theoretical investigations. The position of the electrodes when anomalous values are measured must be used in the interpretation.

In the field procedure, the interval over which the potential differences are measured is the same as the interval over which the electrodes are moved after a series of potential readings has been made. One of the advantages of the induced polarization method is that the same equipment can be used for both detailed and reconnaissance surveys merely by changing the distance (X) over which the electrodes are moved each time. In the past, intervals have been used ranging from 100 feet to 1000 feet for (X). In each case, the decision as to the distance (X) and the values of (N) is largely determined by the expected size of the mineral deposit being sought, the size of the expected anomaly and the speed with which it is desired to progress.

The diagram in Figure 1 below demonstrates the method used in plotting the results. Each value of the apparent resistivity and the apparent "Metal factor" is plotted and identified by the position of the four electrodes when the measurement was made. It can be seen that the values measured for the larger values of (n) are plotted farther from the line indicating that the thickness of the layer of the earth that is being tested is greater than for the smaller values of (n); i. e. the depth of the measurement is increased.

METHOD USED IN PLOTTING DIPOLE DIPOLE
INDUCED POLARIZATION AND RESISTIVITY RESULTS

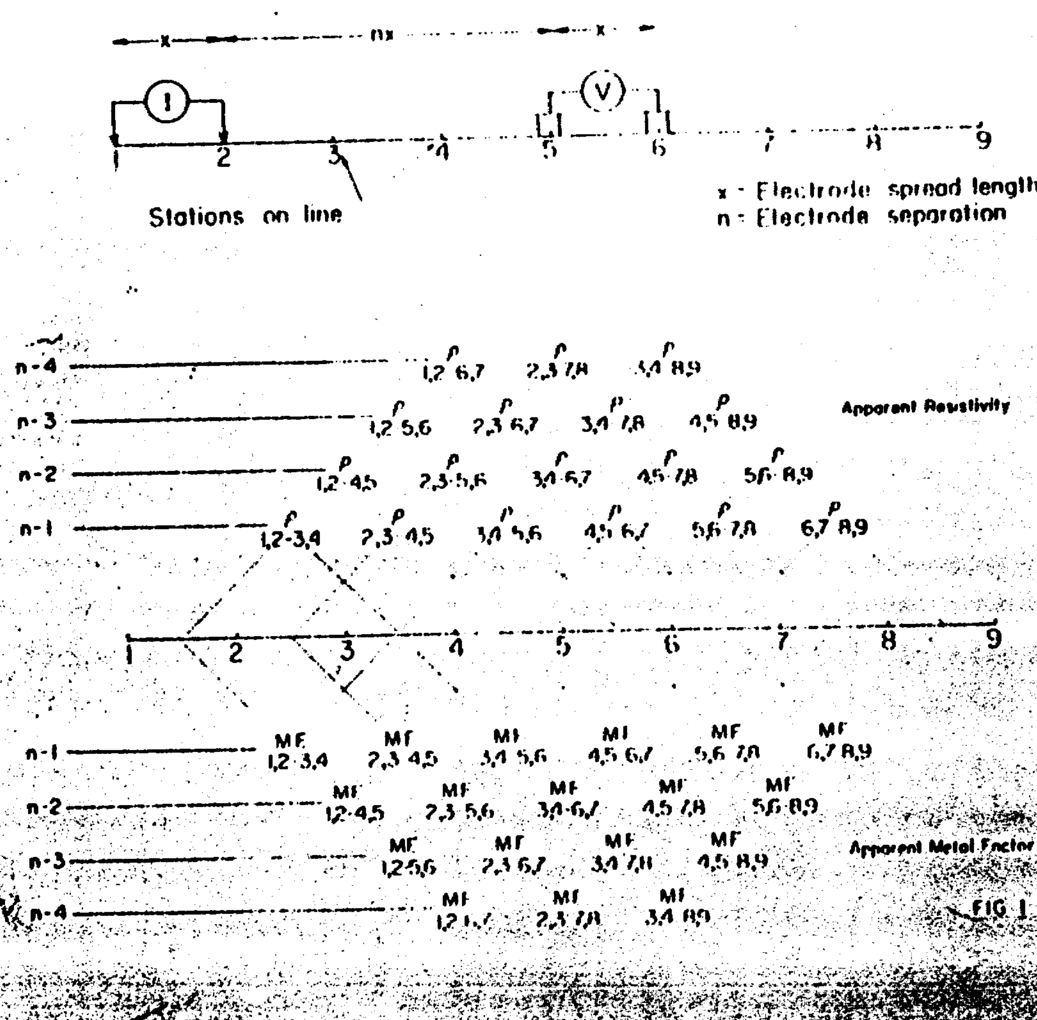

FIG 1

APPENDIX II

DESCRIPTION OF TRENCHES

Eastern Area

Measurements from north end of each trench.

TRENCH A - 39 feet

0' - 4.5' Sheared quartz-feldspar porphyry - fine grained dark grey rock with phenocrysts of quartz and feldspar. Minor pyrite is disseminated through the rock. Chlorite has been developed in association with the moderately strong shearing.

4.5' - 39' Silicified Granite - blue-grey medium grained granite showing pervasive silicification. Some narrow quartz veins are present. Chalcopyrite and pyrite are disseminated throughout and in more places have been concentrated into narrow stringers. Minor molybdenite is sometimes present.

	Cu%	MoS_2%	Ag oz.	Au oz.
m 0' - 4.5'	0.01	0.026	Tr.	Tr.
4.5' - 8'	0.16	0.016	0.11	0.005
8' - 17'	0.81	0.035	0.38	Tr.
	0.85	0.036	-	-
17' - 26'	0.82	0.031	0.43	Tr.
26' - 33'	0.57	0.028	0.23	Tr.
	0.38	0.027	-	-
33' - 39'	0.73	0.031	0.32	0.01

TRENCH B - 7 feet

0' - 7' Silicified Granite as 4.5' - 39' Trench A with 2 - 5% chalcopyrite and pyrite.

	Cu%	MoS_2%	Ag oz.	Au oz.
0' - 4'	0.29	0.017	-	-
4' - 7'	0.23	0.024	0.06	Tr.

TRENCH B[1] - 3 feet

Silicified Granite - as 4.5' - 39' Trench A with 2 - 5% chalcopyrite and pyrite.

Cu%	MoS_2%
0.25	0.033

App. II

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TRENCH C - 23.5 feet

0' - 23.5' **Silicified Granite** - as for 4.5' - 39' Trench A, with 2 - 5% sulphides disseminated through the rock. Chalcopyrite and pyrite throughout with pyrrhotite at north end decreasing towards the south. Occasional quartz veins are present.

	Cu%	MoS_2%	Ag oz.	Au oz.
0' - 8'	0.42	0.028	0.18	Tr.
8' - 16'	0.25	0.027	0.10	Tr.
16' - 23.5'	0.18	0.028	0.05	Tr.

TRENCH D - 85 feet

0' - 13' **Silicified Granite** - fine to medium grained grey granite with pervasive silicification. Moderately sheared with about 1% sulphides disseminated through the rock. Chalcopyrite and pyrite are present with minor bornite and molybdenite in some places.

13' - 55' **Quartz-feldspar porphyry** - as 0' - 4.5' in Trench A. Strongly sheared at 13' decreasing along the trench. Minor pyrite is disseminated through the rock.

55' - 85' As 13' - 55' with weak shearing only - not sampled.

	Cu%	MoS_2%	Ag oz.	Au oz.
0' - 4'	0.24	0.019	0.18	Tr.
4' - 9'	0.22	0.029	-	-
9' - 13'	0.07	0.023	0.05	Tr.
13' - 24'	0.01	0.013	-	-
24' - 40'	0.01	0.022	Tr.	N/f
40' - 55'	0.01	0.012	-	-

TRENCH E - 13 feet

0' - 13' **Silicified Granite** - moderately silicified grey granite with 1 - 2% sulphides disseminated through the rock. Chalcopyrite, pyrite and minor molybdenite were recognized.

Cu%	MoS_2%	Ag oz.	Au oz.
0.14	0.05	0.09	Tr.

TRENCH E[1] - 7 feet

0' - 7' **Granite** - weakly silicified grey granite. Minor chalcopyrite and pyrite are disseminated through the rock.

Cu%	MoS_2%	Ag oz.	Au oz.
0.06	0.024	0.04	Tr.

12

TRENCH F - 25.5 feet

0'	-	1'	Dark Schist - well foliated black micaceous schist. No sulphides observed.
1'	-	1.5'	Silicified Granite - as 0' - 13' in Trench E. 1% sulphides occurring as chalcopyrite, pyrite and minor molybdenite are disseminated throughout the rock.
1.5'	-	2.5'	Dark Schist - as for 0' - 1'.
2.5'	-	25.5'	Silicified Granite - as for 4.5' - 39' in Trench A. 1% disseminated sulphides occur as chalcopyrite and pyrite.

			Cu%	MoS_2%	Ag oz.	Au oz.
0'	-	10'	0.11	0.040	-	-
10'	-	18'	0.07	0.017	0.06	0.003
18'	-	25.5'	0.13	0.055	-	-

TRENCH G - 97 feet

0'	-	46'	Granite - medium grained grey granite containing occasional grains of pyrite and chalcopyrite. 0' - 42' not sampled.
47'	-	48'	Dark Schist - as 0' - 1' in Trench F.
48'	-	87'	Granite - as for 0' - 46' but some weak pervasive silicification is noticeable.
87'	-	89'	Shear Zone - well sheared granitic rock.
89'	-	97'	Silicified Granite - as 0' - 18' in Trench E with minor chalcopyrite and pyrite disseminated through the rock.

			Cu%	MoS_2%	Ag oz.	Au oz.
42'	-	62.5'	0.06	0.021	Tr.	Tr.
62.5'	-	86.5'	0.06	0.039	Tr.	Tr.
86.5'	-	97'	0.05	0.033	0.12	Tr.
Pit 9			0.05	0.015		
10			0.23	0.028		
11			0.11	0.035		

App ?

19

WESTERN AREA

Measurements from south end of trench.

TRENCH H - 21 feet

0' - 0' 4"	Chlorite Schist - with schistosity dipping at 75° to the north.
0' 4" - 1' 0"	Quartz Tourmaline Vein - well mineralized with 5% pyrite, chalcopyrite and pyrrhotite, dipping 75° north.
1' 0" - 21' 0"	Silicified Granite - pale bluish grey medium grained granite with pervasive silicification, mineralized with about 3% sulphides as pyrrhotite, pyrite and chalcopyrite.

	Cu%	MoS_2%
0' - 5'	.60	.003
5' - 10'	.24	.004
10' - 15'	.39	.002
15' - 21'	.24	.002

APP. II

—20

APPENDIX III

SEE ACCOMPANYING MAP(S) IDENTIFIED AS

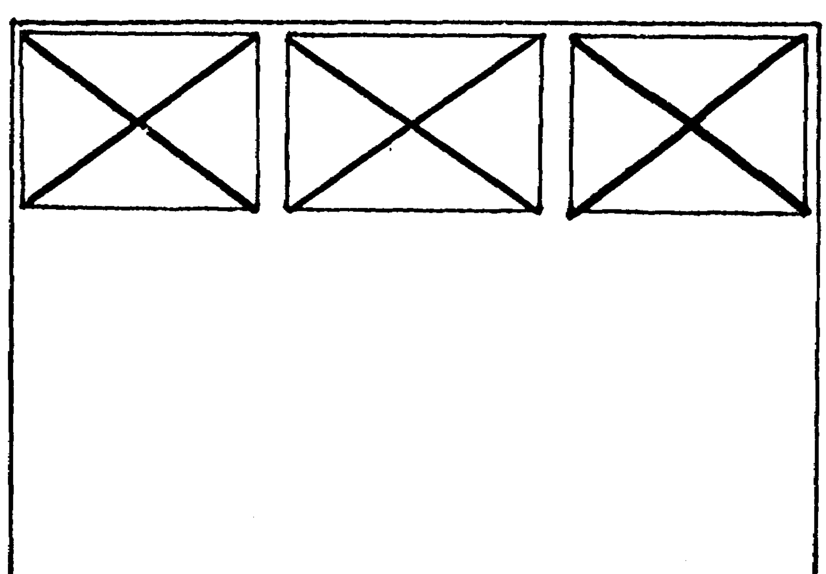
52G14SE0012 52G/14SE-79 VALORA LAKE

900

52G/14SE-0079 #1-3

LOCATED IN THE MAP CHANNEL IN THE FOLLOWING SEQUENCE

(X)



FOR ADDITIONAL

INFORMATION

SEE MAPS:

52G/14SE-0079 #4-14

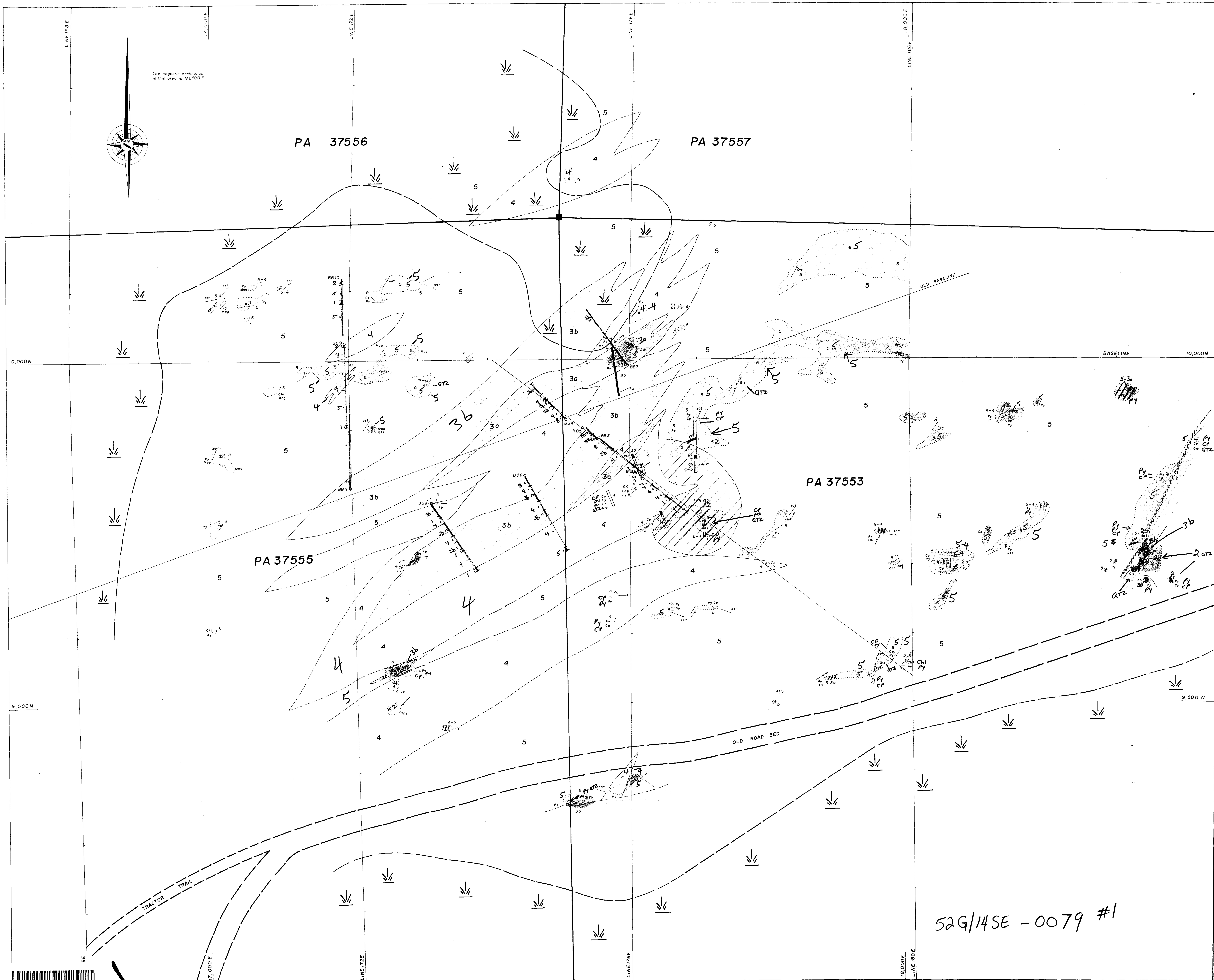


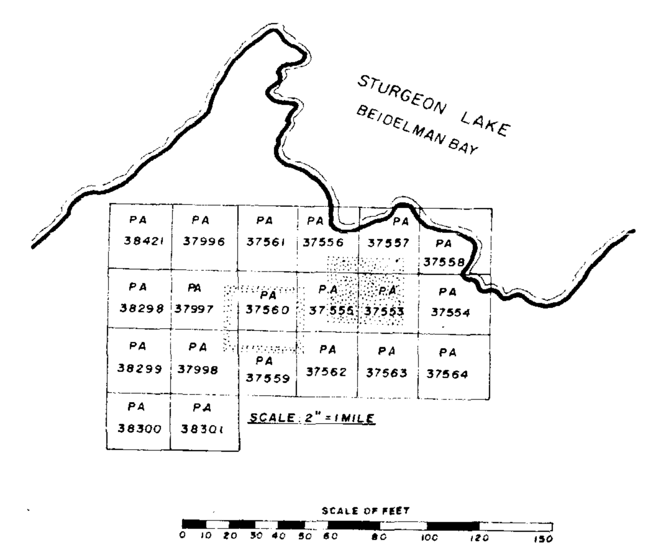
TABLE OF FORMATIONS

1 Dark Schist; a: Chlorite Schist
2 Quartz Diorite; a: Diorite
3a/3b a: Quartz Feldspar Porphyry; b: Feldspar Porphyry
4 Silicified Granite; a: Blue Quartz Eye Granite
5 Granite; a: Sericitized Granite; b: Granodiorite
6 Feldspar Granite
7 Breccia
8 Overburden

LEGEND

Mo	Molybdenite
Cp	Chalcopyrite
Py	Pyrite
Pr	Pyrrhotite
Mag	Magnetite
Chl	Chlorite
Qtz	Quartz

- Jointing vertical dip
- Jointing direction with dip
- Bedding direction with dip
- Shearing direction with dip
- Angular blocks
- Shear zone
- Fault
- Outcrop exposure
- Geological contact
- Pit
- Trench
- Diamond Drill hole
- Cut and chained lines
- Claim lines with post
- Outline of surface features
- Swamp



EASTERN PART OF TWO PARTS

N.T.S. REFERENCE 52-G/14

STEEP ROCK IRON MINES LTD.

BEIDELMAN BAY PROPERTY, STURGEON LAKE, PATRICIA MIN. DIV.

DETAILED GEOLOGY

DATE: October 24, 1967
SCALE: 1 Inch = 50 Feet
S. J. CARRIER, Geologist

52G/14SE -0079 #1

200

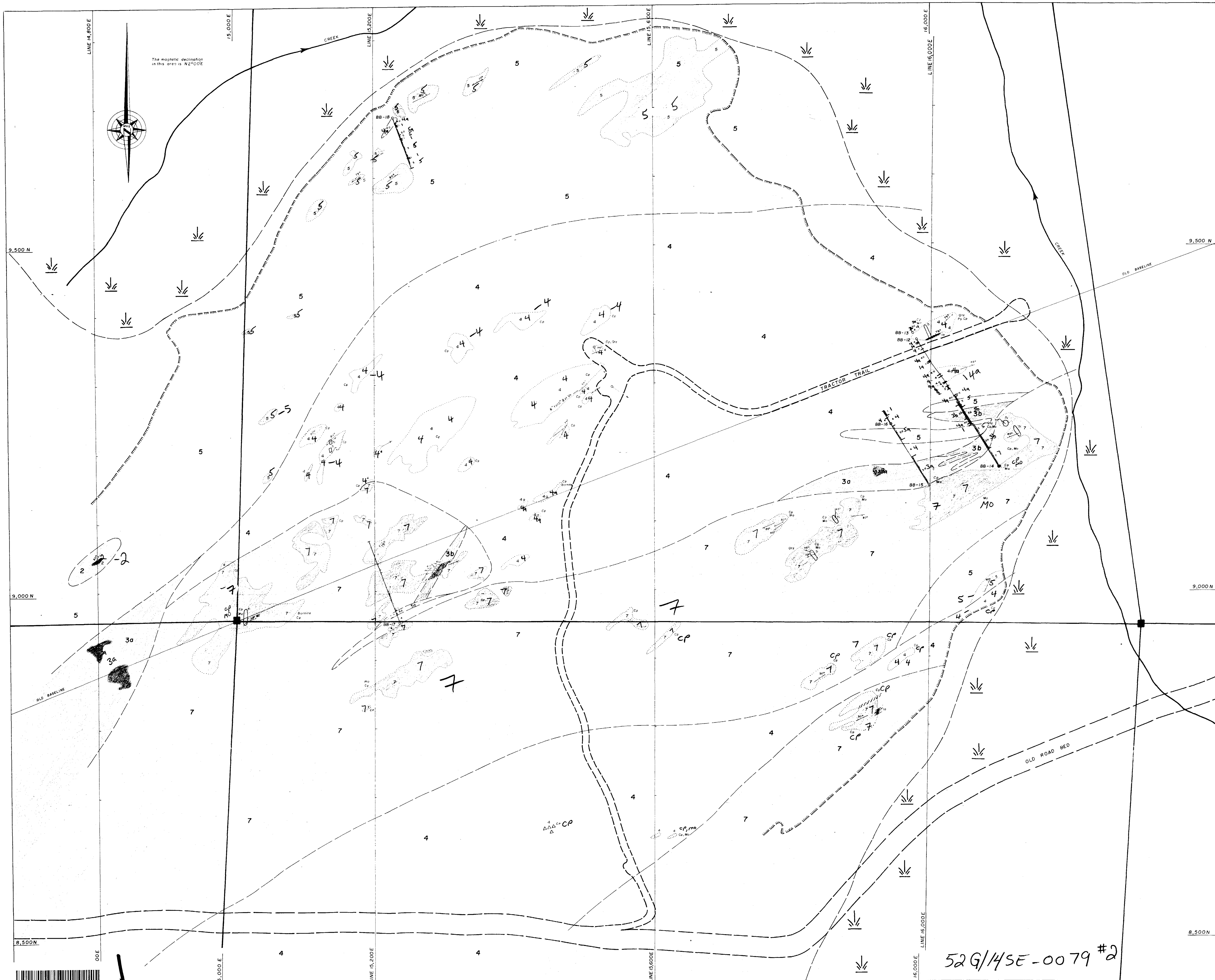


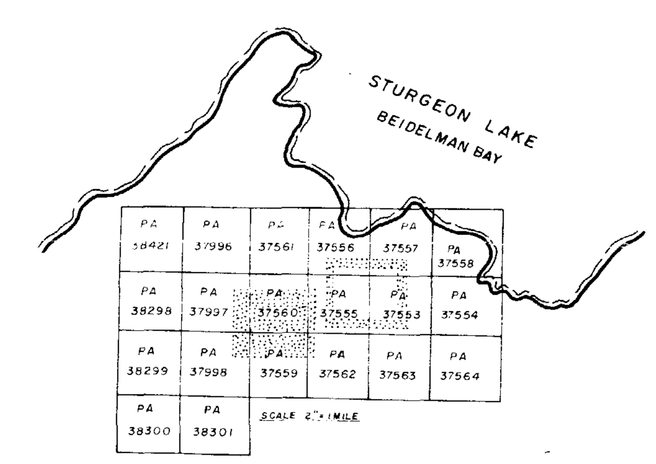
TABLE OF FORMATIONS

1 Dark Schist, a: Chlorite Schist
2 Quartz Diorite, a: Diorite
3/3b a: Quartz Feldspar Porphyry; b: Feldspar Porphyry
4 Silicified Granite; a: Blue Quartz Eye Granite
5 Granite; a: Sericitized Granite; b: Granodiorite
6 Feldspar Granite
7 Breccia
8 Overburden

LEGEND

Mo	Molybdenite
Cp	Chalcopyrite
Py	Pyrite
Pr	Pyrrhotite
Mag	Magnetite
Chl	Chlorite
Qtz	Quartz

Jointing vertical dip
Jointing direction with dip
Bedding direction with dip
Shearing direction with dip
Angular blocks
Shear zone
Fault
Outcrop exposure
Geological contact
Pit
Trench
Diamond Drill hole
Cut and chained lines
Claim lines with post
Outline of surface features
Swamp



SCALE OF FEET
0 10 20 30 40 50 60 80 100 120 150

WESTERN PART OF TWO PARTS

N.T.S. REFERENCE 52-G/14

STEEP ROCK IRON MINES LTD.

BEIDELMAN BAY PROPERTY, STURGEON LAKE, PATRICIA MIN. DIV.

DETAILED GEOLOGY

DATE: September 21, 1967 S.S.S.
SCALE: 1 Inch = 50 Feet
APP: L. B. STAINES

52G/14SE-0079 #2

210

52G14SE0612 52G/14SE-79 VALORA LAKE

STEEP ROCK IRON MINES LTD.
BEIDELMAN BAY PROPERTY, STURGEON LAKE, PATRICIA MIN. DIV.
MAGNETOMETER SURVEY
(FLUXGATE)
DATE: JANUARY, 1967
SCALE: 1 INCH = 200 FEET
S.J. Cerryer, Geologist
N.T.S. REFERENCE 52-G/14
52G/14SE-0079 #3
LEGEND
Outline of Surface Features
Swamp
Creek
Shore Line
Base of Slope
Old Road Bed
Claim Lines with Post
Cut Lines with Measured Stations
Stations on Paced Line
Readings in Gammas
The magnetic declination in this area is N2°00'E
STURGEON LAKE
BEIDELMAN BAY
Campsite
PA 38421
PA 37996
PA 37561
PA 37556
PA 37557
PA 37558
PA 38298
PA 37997
PA 37560
PA 37555
PA 37553
PA 37554
PA 38299
PA 37998
PA 37559
PA 37562
PA 37563
PA 37564
PA 38300
PA 38301
13,000 E
14,000 E
15,000 E
16,000 E
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20,000 E
11,000 N
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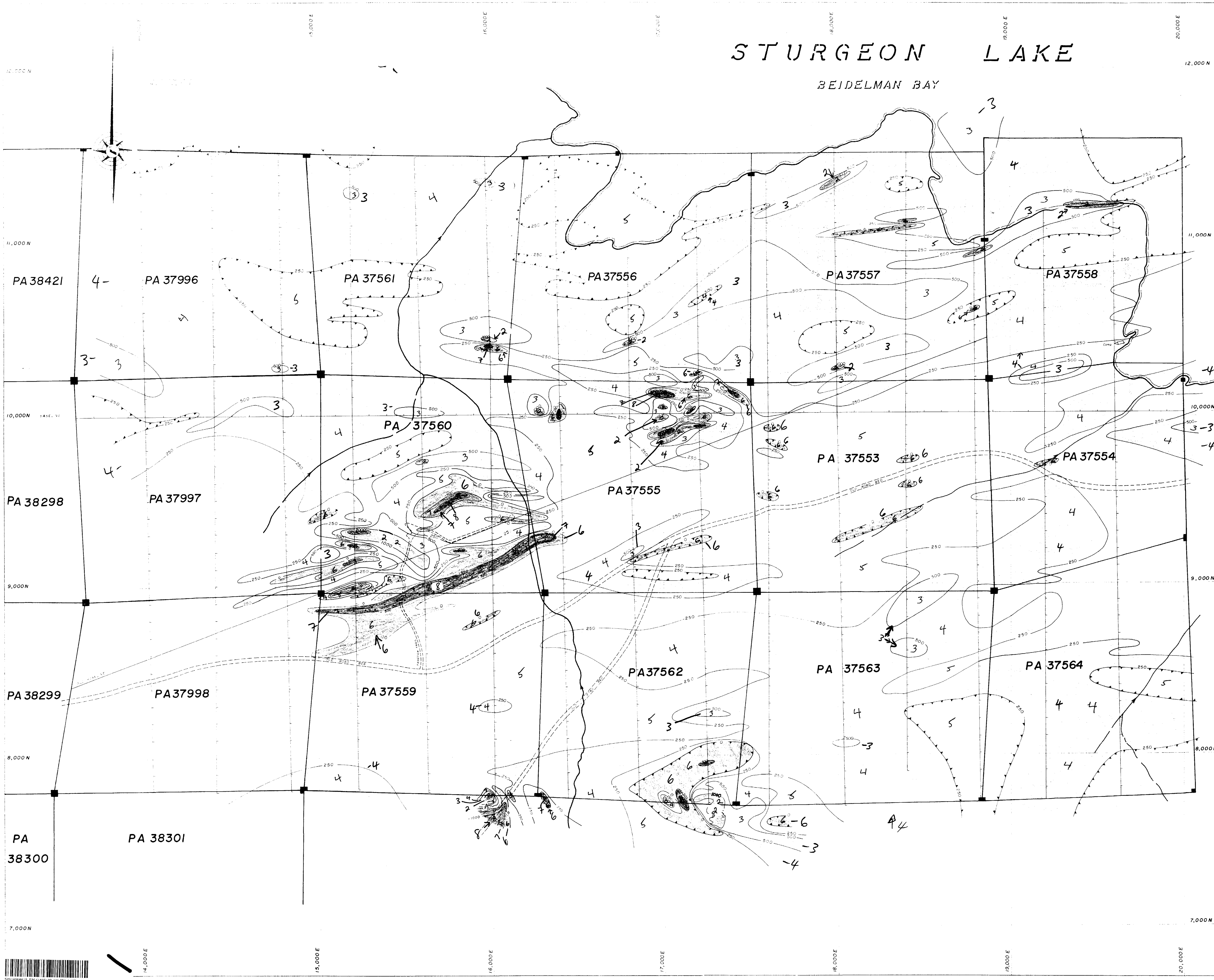
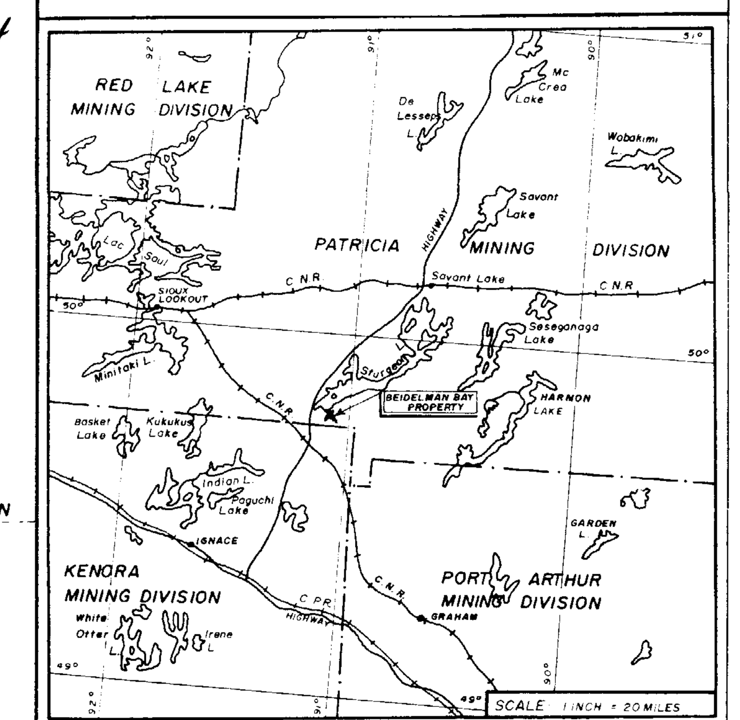
9,000 N
8,000 N
7,000 N
220

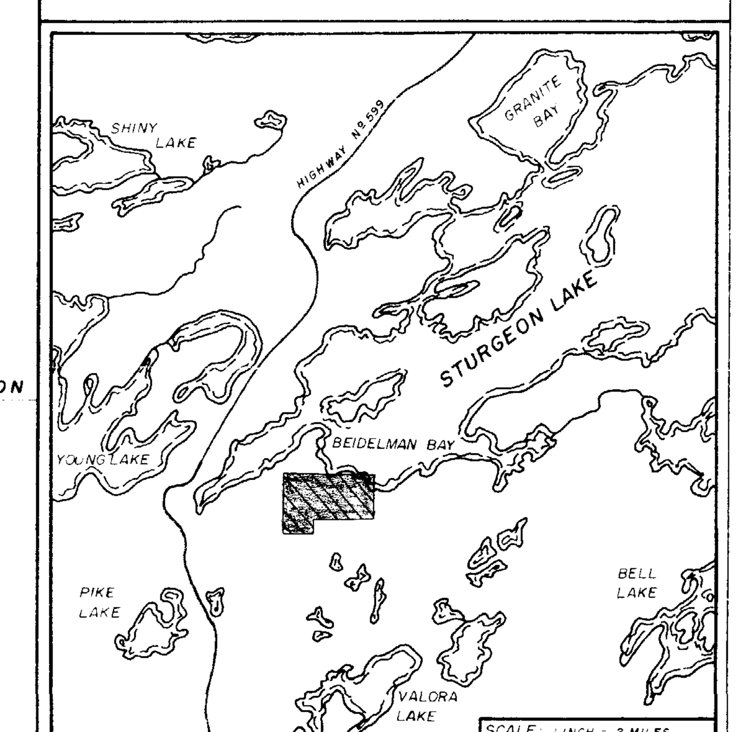


LEGEND

- Cut Lines with Measured Stations
- Claim Lines with Corner Post
- Shore Line
- Creek
- Magnetic Depression

1		Greater than 2,000 gammas
2		1,000 gammas to 2,000 gammas
3		500 gammas to 1,000 gammas
4		250 gammas to 500 gammas
5		0 gammas to 250 gammas
6		-500 gammas to 0 gammas
7		-1,000 gammas to -500 gammas
8		Less than -1,000 gammas





52G/14SE-0079 #4

SCALE OF FEET

N.T.S. REFERENCE 52-G/14

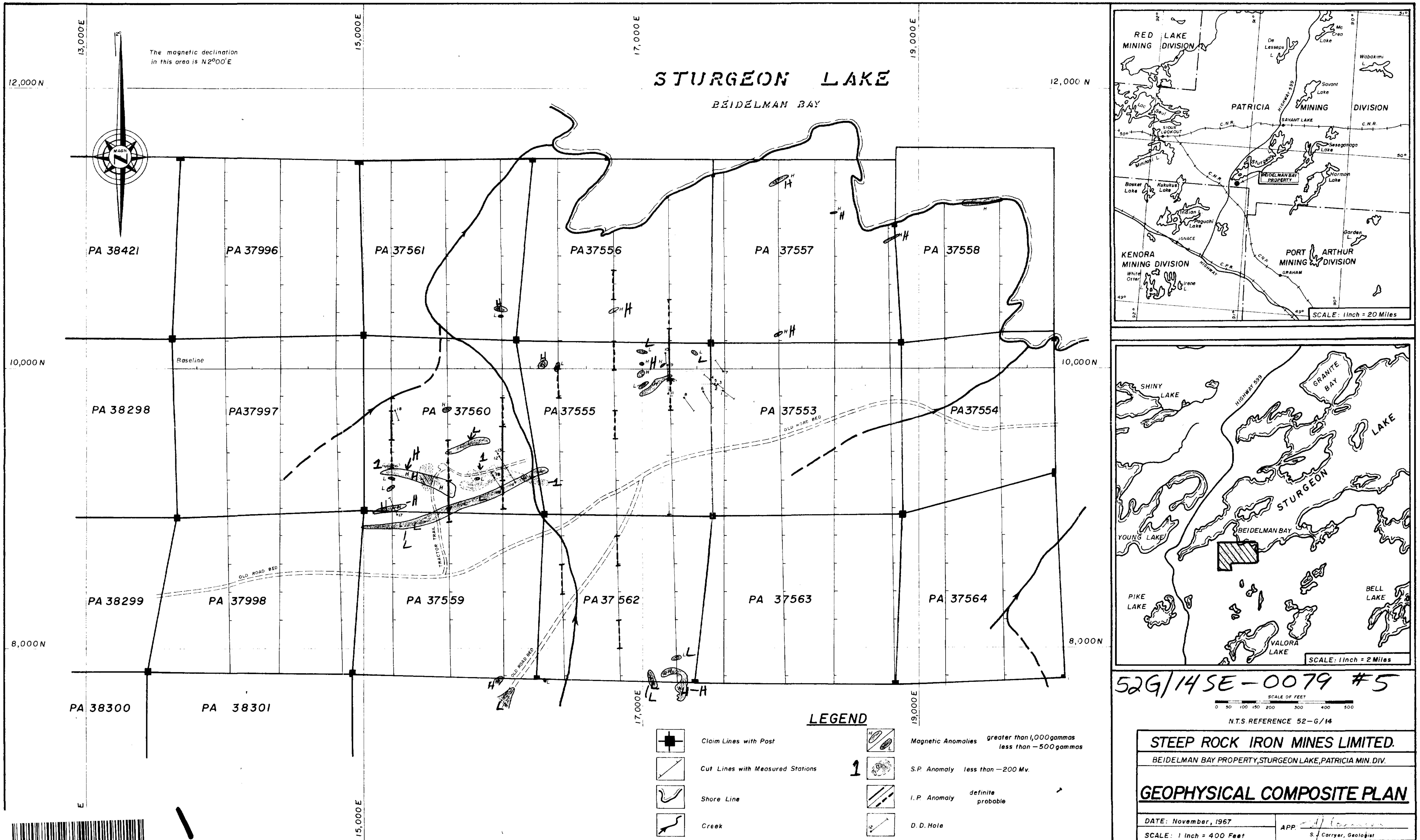
STEEP ROCK IRON MINES LTD.

BEIDELMAN BAY PROPERTY, STURGEON LAKE, PATRICIA MIN. DIV.

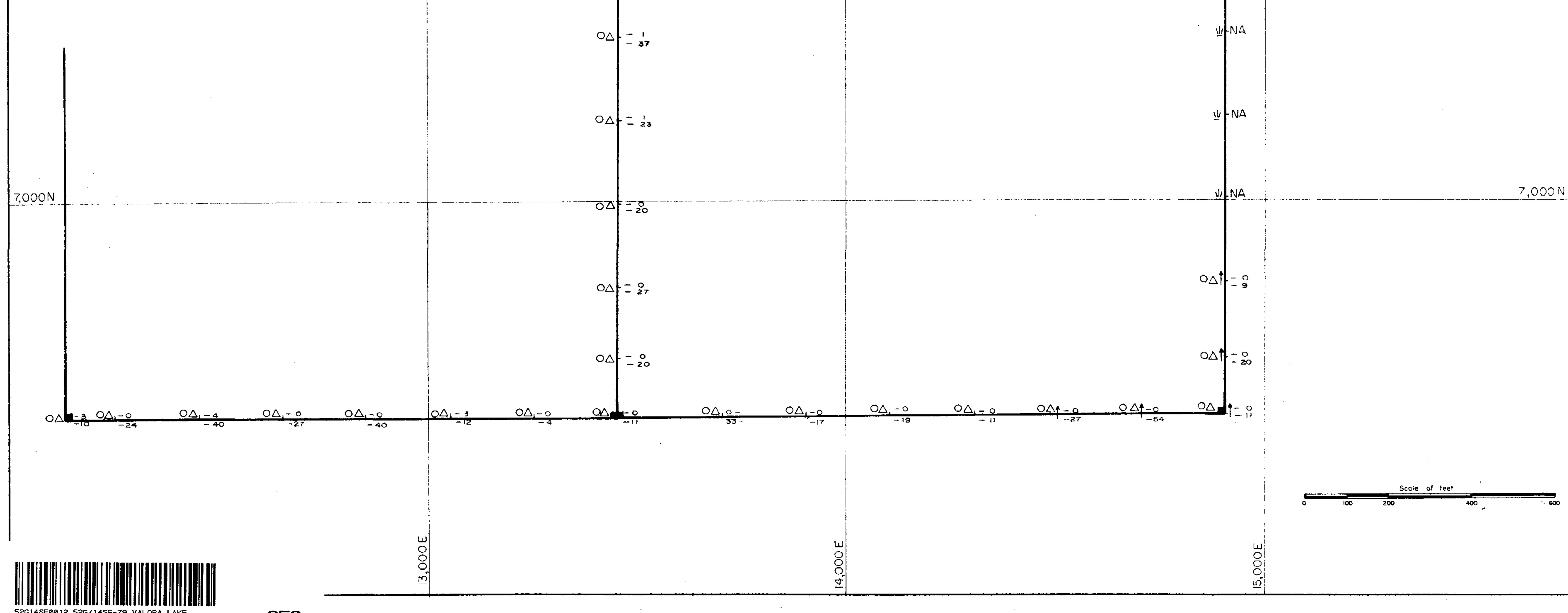
MAGNETOMETER CONTOUR PLAN

(FLUXGATE)

DATE	September, 1967	APP.	
SCALE	1 Inch = 200 Feet		S. J. Gehyer, Geologist



STURGEON LAKE
BEIDELMAN BAY
The magnetic declination in this area is N2°00'E
12,000 N
10,000 N
8,000 N
13,000 E
15,000 E
17,000 E
19,000 E
Baseline
OLD ROAD BED
TRACTOR TRAIL
PA 38421
PA 37996
PA 37561
PA 37556
PA 37557
PA 37558
PA 38298
PA 37997
PA 37560
PA 37555
PA 37553
PA 37554
PA 38299
PA 37998
PA 37559
PA 37 562
PA 37563
PA 37564
PA 38300
PA 38301
LEGEND
Claim Lines with Post
Cut Lines with Measured Stations
Shore Line
Creek
Magnetic Anomalies greater than 1,000 gammas less than -500 gammas
S.P Anomaly less than -200 Mv.
I.P Anomaly definite probable
D.D. Hole
RED LAKE MINING DIVISION
PATRICIA MINING DIVISION
KENORA MINING DIVISION
PORT ARTHUR MINING DIVISION
BEIDELMAN BAY PROPERTY
HIGHWAY 599
C.N.R.
C.P.R.
SCALE: 1 Inch = 20 Miles
SHINY LAKE
GRANITE BAY
STURGEON LAKE
BEIDELMAN BAY
YOUNG LAKE
PIKE LAKE
BELL LAKE
VALORA LAKE
SCALE: 1 Inch = 2 Miles
52G/14SE-0079 #5
SCALE OF FEET
0 50 100 150 200 300 400 500
N.T.S REFERENCE 52-G/14
STEEP ROCK IRON MINES LIMITED.
BEIDELMAN BAY PROPERTY, STURGEON LAKE, PATRICIA MIN. DIV.
GEOPHYSICAL COMPOSITE PLAN
DATE: November, 1967
SCALE: 1 Inch = 400 Feet
APP.
S.J. Carryer, Geologist
52G14SE0012 52G/14SE-79 VALORA LAKE
240



SOIL TYPE

- L Loam
- S Silt
- .. Sand
- :: Outwash sand
- o Gravel
- O Boulders
- Δ Till
- H Humus (dry)
- Swamp (wet humus)
- Oc. Outcrop

TOPOGRAPHY

Slope in direction indicated.

- Flat.
- Gentle.
- Moderate.
- Steep.
- Cut lines.

SAMPLE RESULTS

- NA Not analysed.
- — Not sampled
- ( ) Check sample results

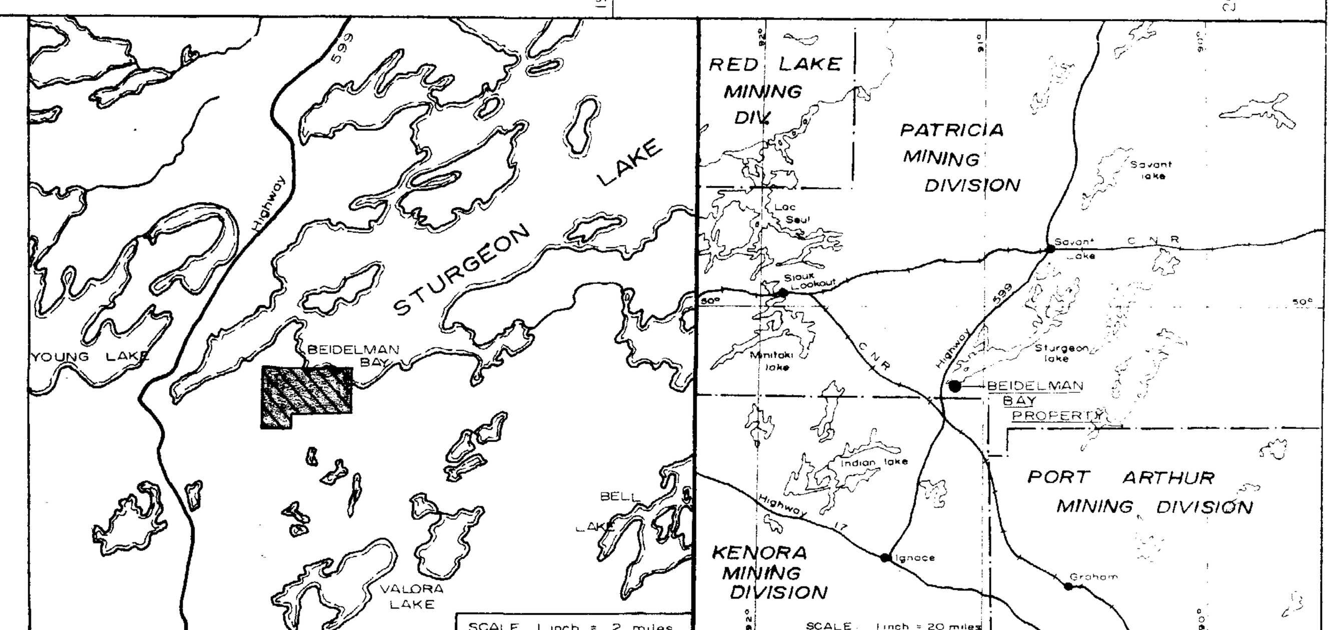
OΔ 2 0 / 34 21

'B' horizon – T.H.M. in p.p.m. by cold citrate extraction.
'C' " – " " " " " " "
'C' horizon – Cu in p.p.m. by hot HCl extraction.
'B' " – " " " " " " "

NOTE – all analyses on the minus 80 mesh fraction.

52G/14SE-0079 #6

NTS Ref. 52-G-14



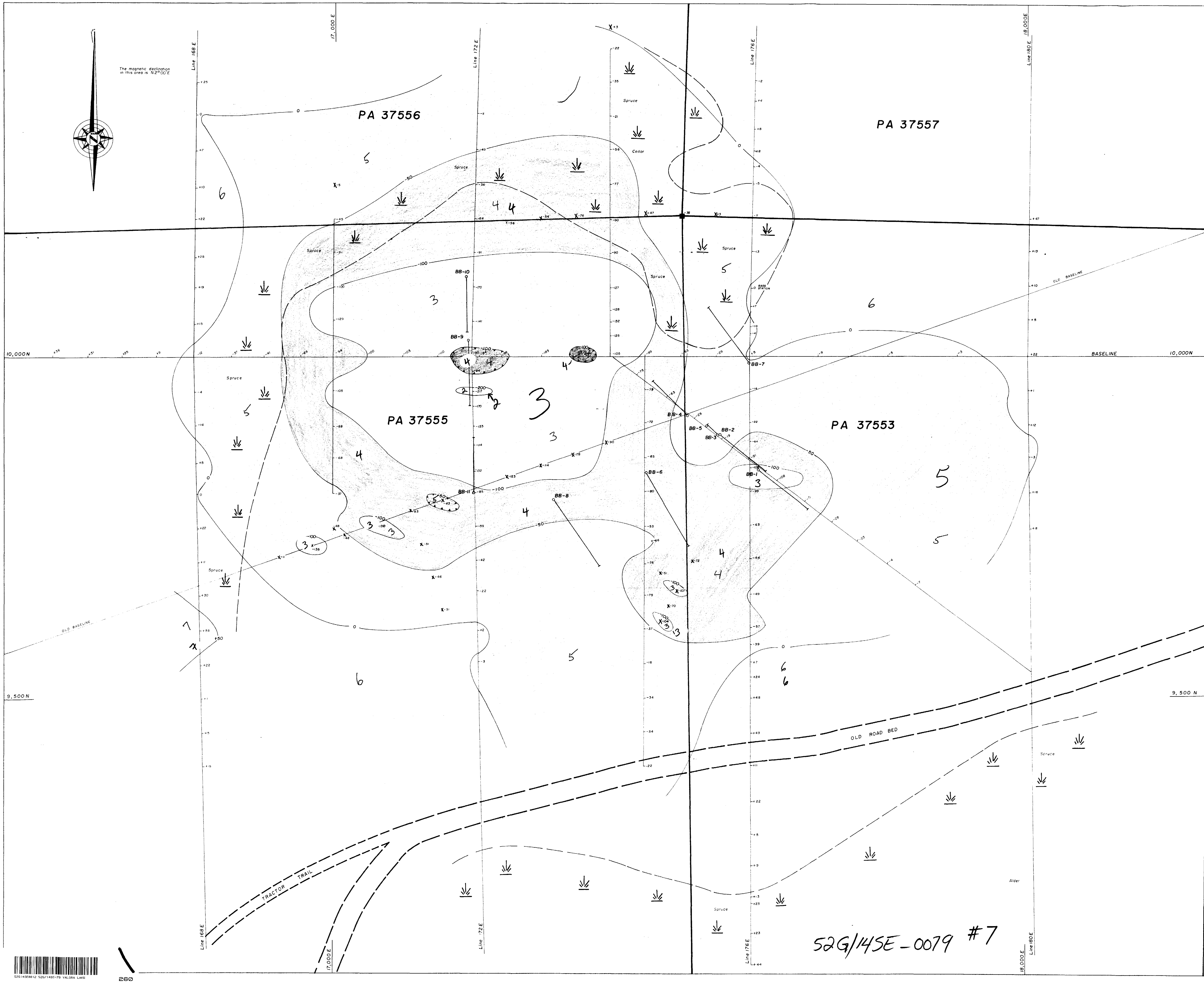
STEEP ROCK IRON MINES LTD.

BEIDELMAN BAY PROPERTY, STURGEON LAKE, PATRICIA MIN. DIV.

GEOCHEMICAL PLAN

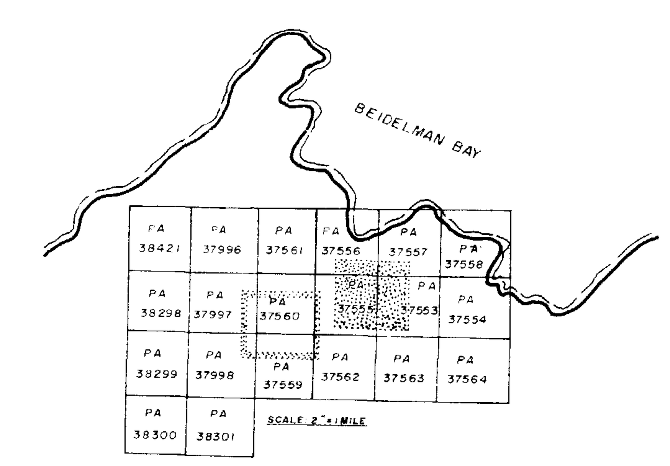
DATE: NOV. 1967
SCALE: 1 inch = 200 feet
APP: S. J. Carryer Geologist

52G14SE0012 52G/14SE-79 VALORA LAKE



SELF POTENTIAL IN MILLIVOLTS (MV)

1 LESS THAN -300 MV
2 -200 MV to -300 MV
3 -100 MV to -200 MV
4 -50 MV to -100 MV
5 0 to -50 MV
6 +50 MV to 0
7 GREATER THAN +50 MV



SCALE OF FEET
0 10 20 30 40 50 60 80 100 120 150

EASTERN PART OF TWO PARTS

N.T.S. REFERENCE 52-G/14

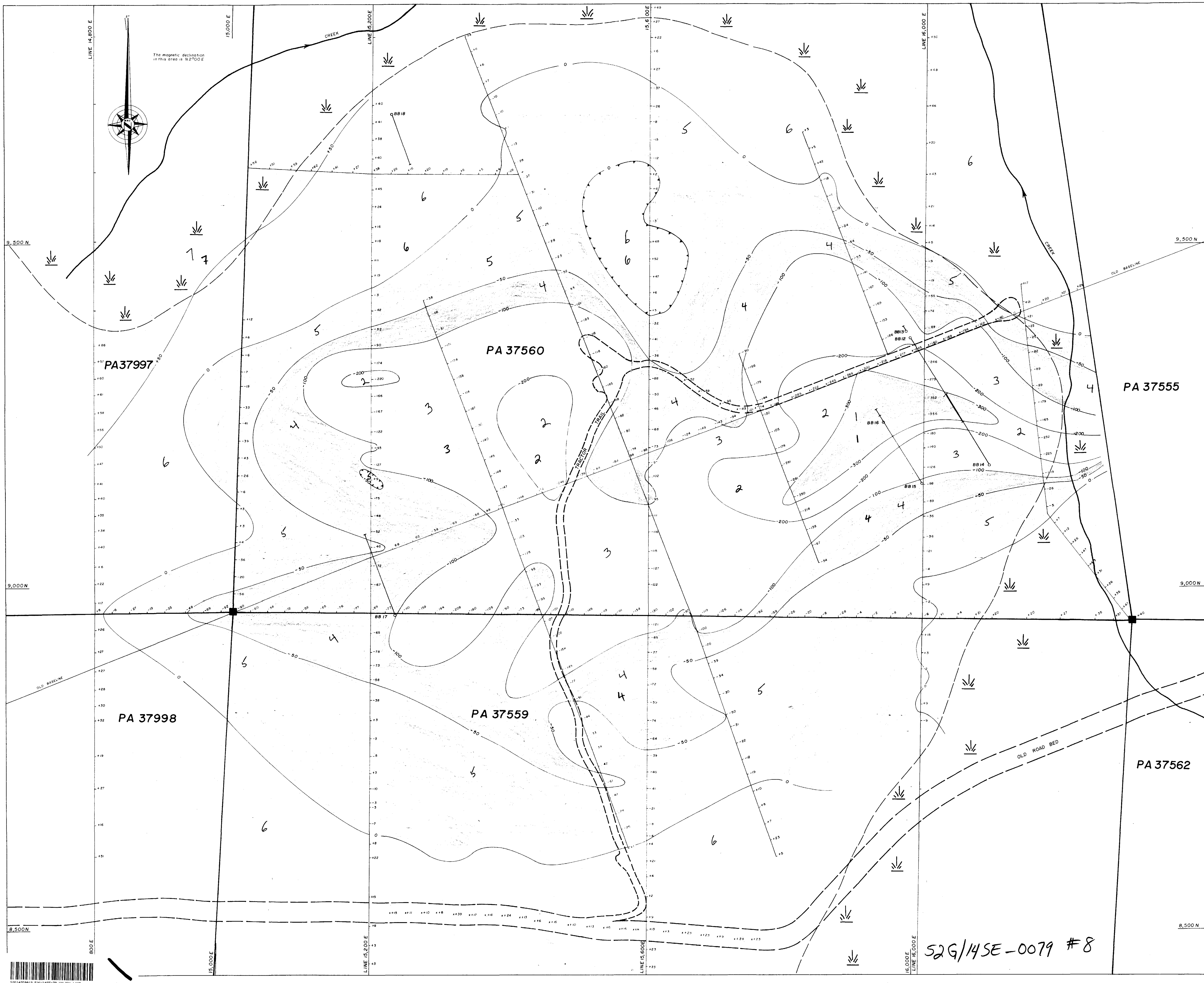
STEEP ROCK IRON MINES LTD.

BEIDELMAN BAY PROPERTY, STURGEON LAKE, PATRICIA MIN. DIV.

SELF POTENTIAL SURVEY

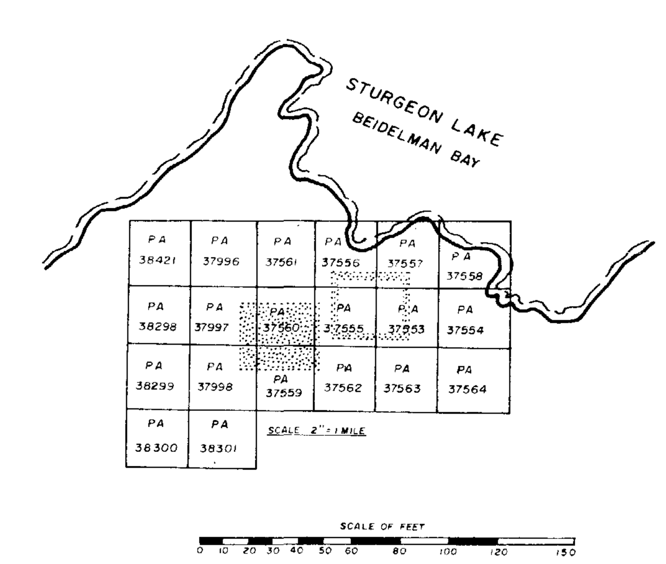
DATE: September 14, 1967 S.S.S.
SCALE: 1 Inch = 50 Feet
APP: A. T. Avison
A. T. AVISON, Geologist

260



SELF POTENTIAL IN MILLIVOLTS (MV)

1 LESS THAN −300 MV
2 −200 MV to −300 MV
3 −100 MV to −200 MV
4 −50 MV to −100 MV
5 0 to −50 MV
6 +50 MV to 0
7 GREATER THAN +50 MV



WESTERN PART OF TWO PARTS

N.T.S. REFERENCE 52-G/14

STEEP ROCK IRON MINES LTD.

BEIDELMAN BAY PROPERTY, STURGEON LAKE, PATRICIA MIN. DIV.

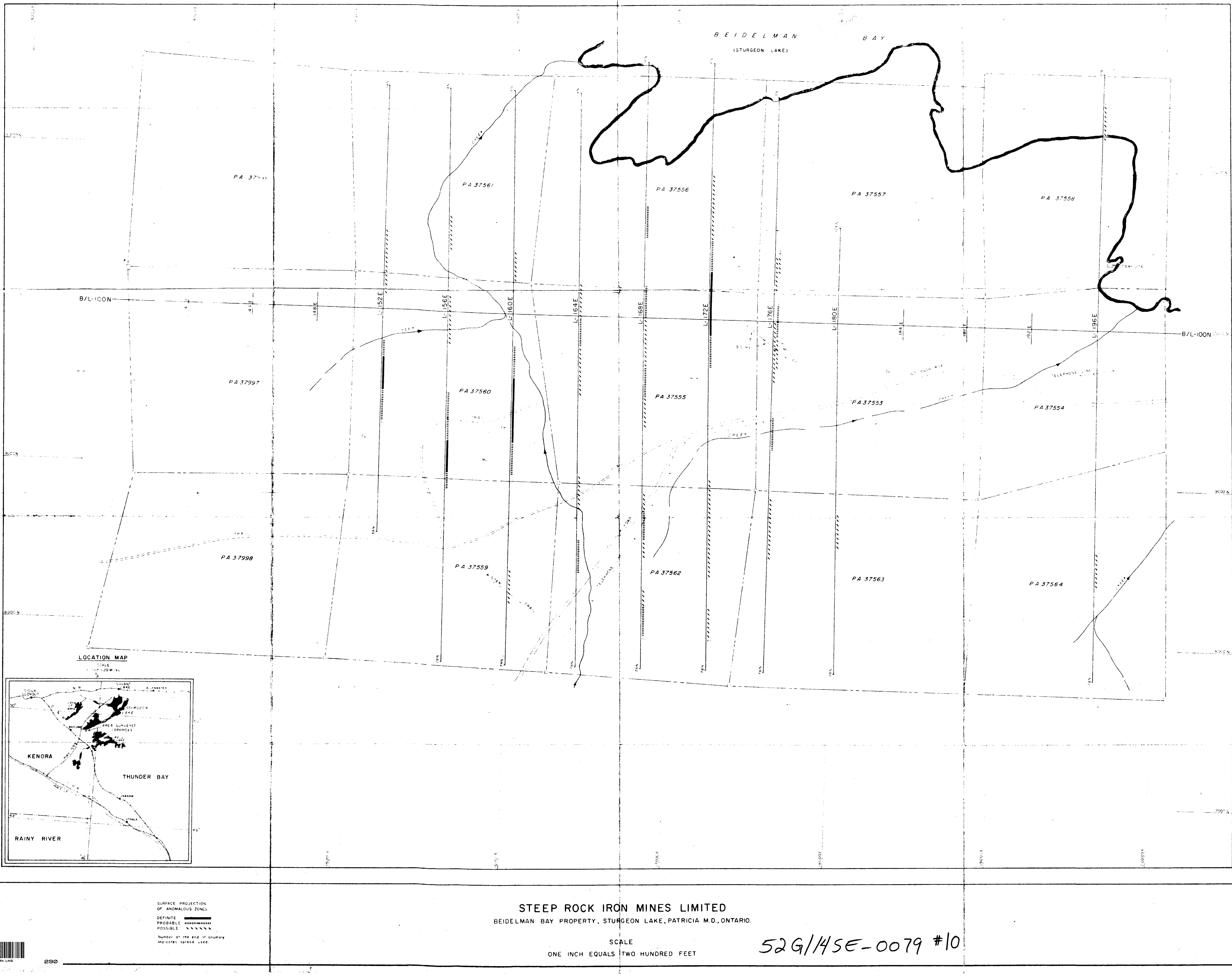
SELF POTENTIAL SURVEY

DATE: September 11, 1967
SCALE: 1 inch = 50 Feet
APP.: S. J. CARRYER, Geologist

270


STEEP ROCK IRON MINES LTD.
BEIDELMAN BAY PROPERTY, STURGEON LAKE, PATRICIA MIN. DIV.
RECONNAISSANCE SELF POTENTIAL PROFILES
DATE: August 30, 1967
SCALE: Horz. 1"=100' Vert. 1"=50 MV.
APP:
S. J. Carryer, Geologist
N.T.S. REFERENCE 52-G/14
READINGS IN MILLIVOLTS PLOTTED 1"=50MV USING
CUT LINES WITH MEASURED STATIONS AS ZERO LINE
STURGEON LAKE
BEIDELMAN BAY
PA 37559
PA 37562
PA 37563
LINE 160E
LINE 164E
LINE 168E
LINE 172E
LINE 176E
SOUTH CLAIM LINE
52G/14SE-0079 #9
280

McPHAR GEOPHYSICS LIMITED
INDUCED POLARIZATION AND RESISTIVITY SURVEY
PLAN MAP



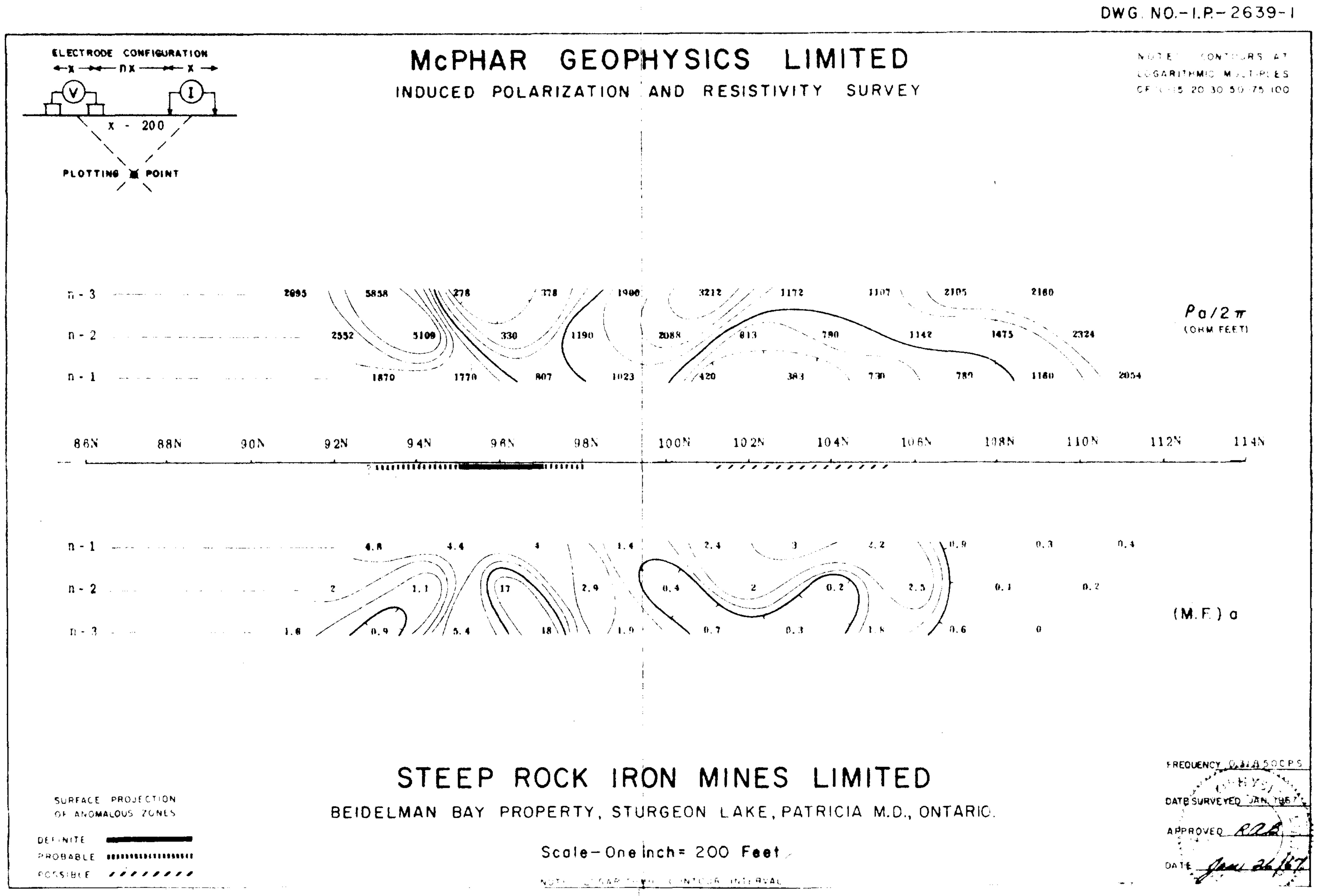
SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE
Number at the end of anomaly indicates spread used.

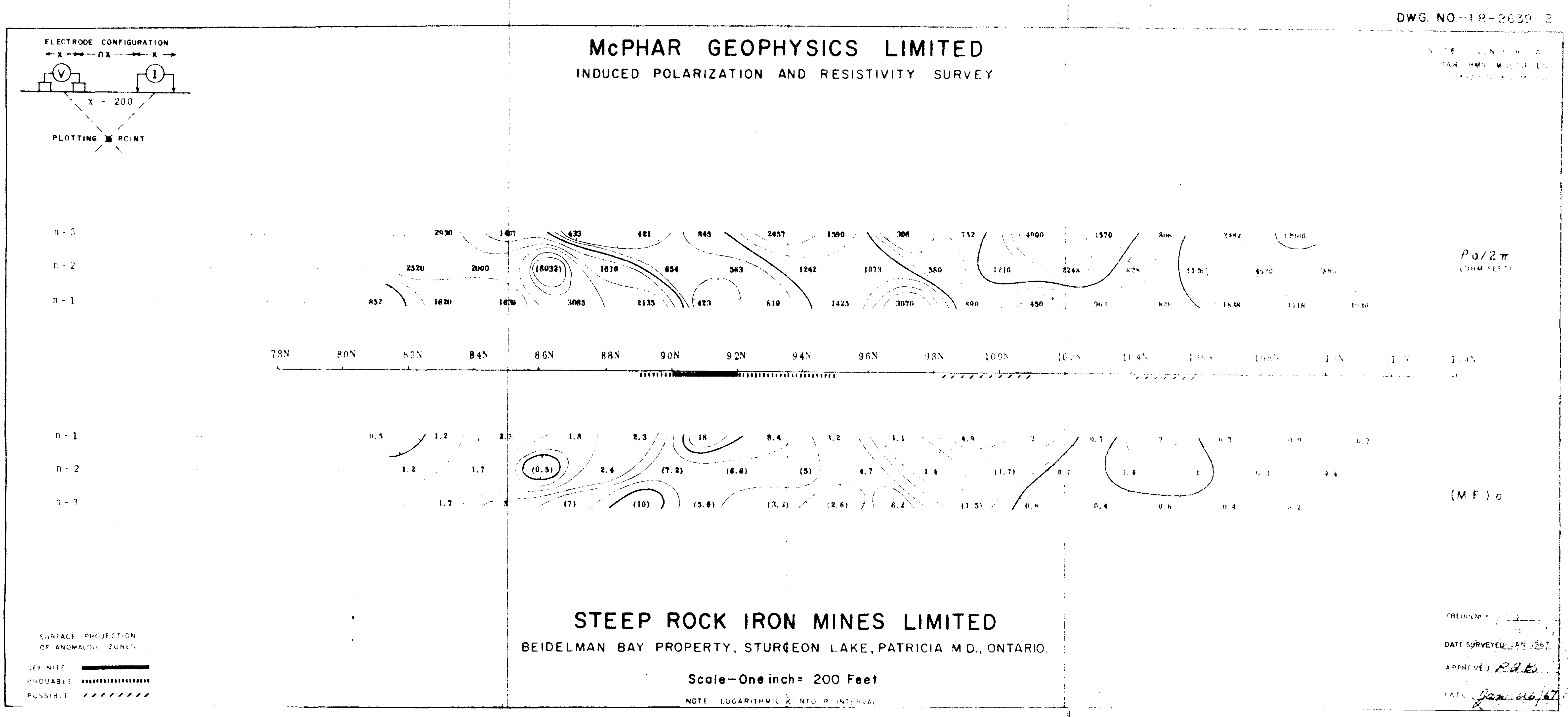
STEEP ROCK IRON MINES LIMITED
BEIDELMAN BAY PROPERTY, STURGEON LAKE, PATRICIA M.D., ONTARIO.

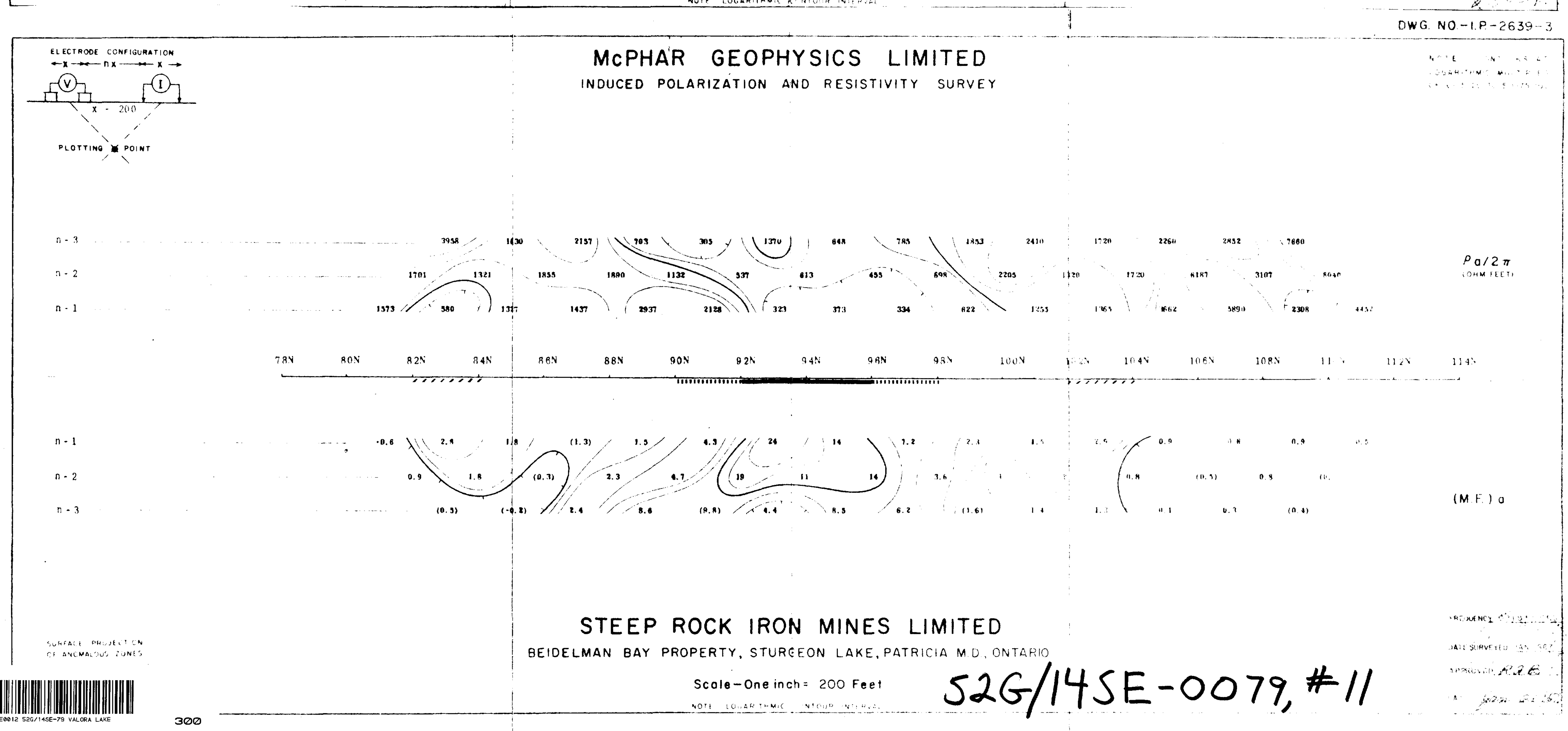
SCALE
ONE INCH EQUALS TWO HUNDRED FEET

52G/14SE-0079 #10

DWG. MISC. 4288





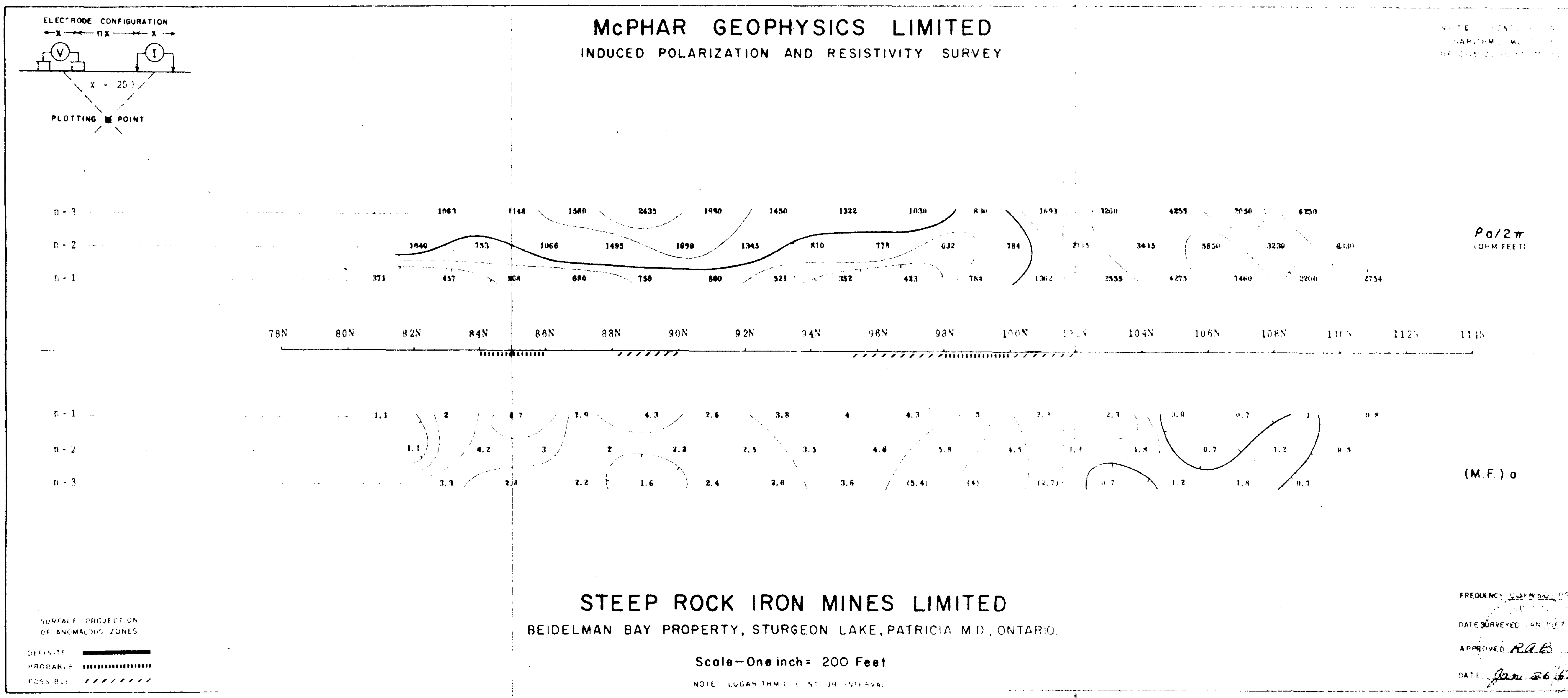


52G/14SE-0079, #11

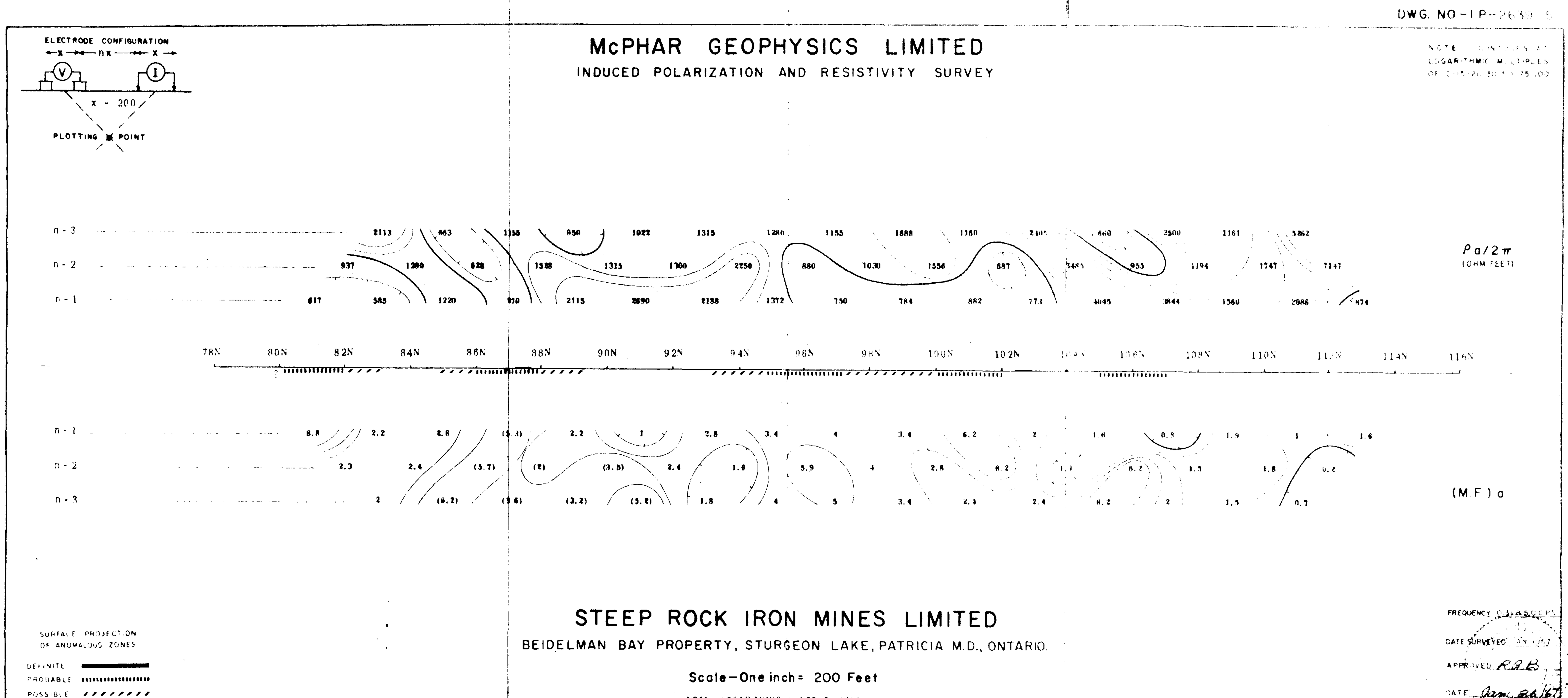
52G14SE0012 52G/14SE-79 VALORA LAKE

300

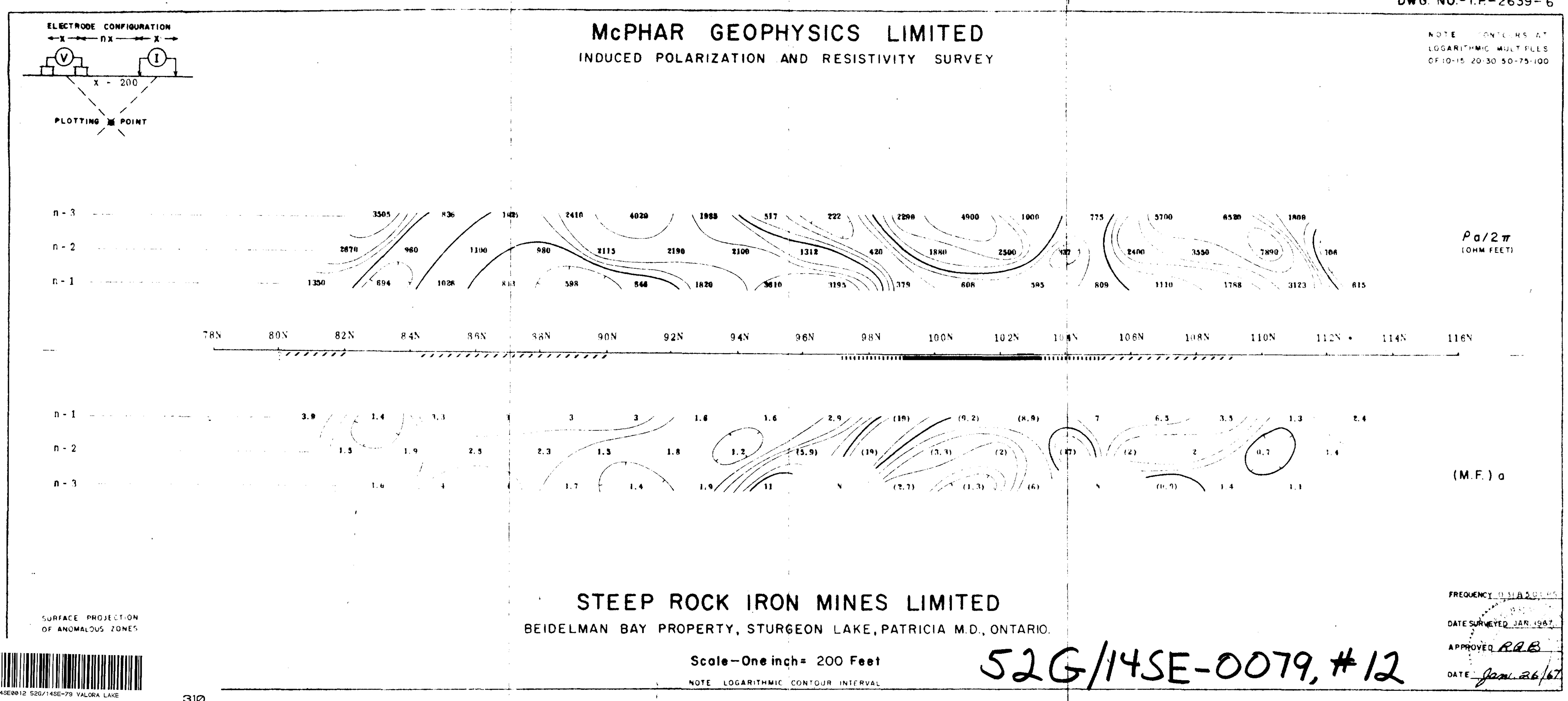
DWG. NO.-I.P.-2639-4



DWG. NO.-I.P.-2639-5



DWG. NO.-I.P.-2639-6



52G/14SE-0079, #12

310

DWG. NO - I.P.-2639-7

ELECTRODE CONFIGURATION

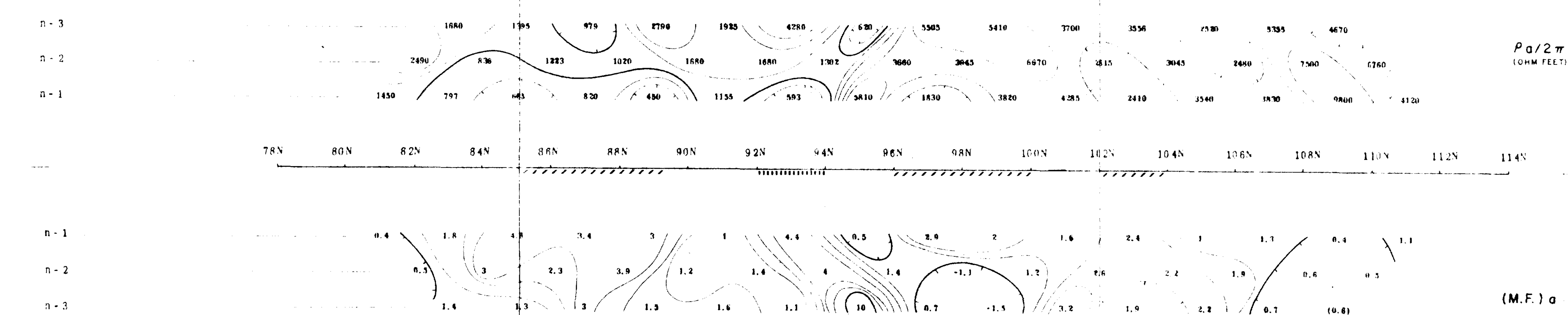
x - 200

PLOTTING POINT

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY

NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10, 15, 20, 30, 50, 75, 100



LINE NO - 176E

STEEP ROCK IRON MINES LIMITED

BEIDELMAN BAY PROPERTY, STURGEON LAKE, PATRICIA M.D., ONTARIO.

Scale - One inch = 200 Feet

NOTE: LOGARITHMIC CONTOUR INTERVAL

SURFACE PROJECTION OF ANOMALOUS ZONES

DEFINITE

PROBABLE

POSSIBLE

FREQUENCY

DATE SURVEYED JAN. 1967

APPROVED R.A.B.

DATE Jan. 26/67

DWG. NO. - I.P. 2639-8

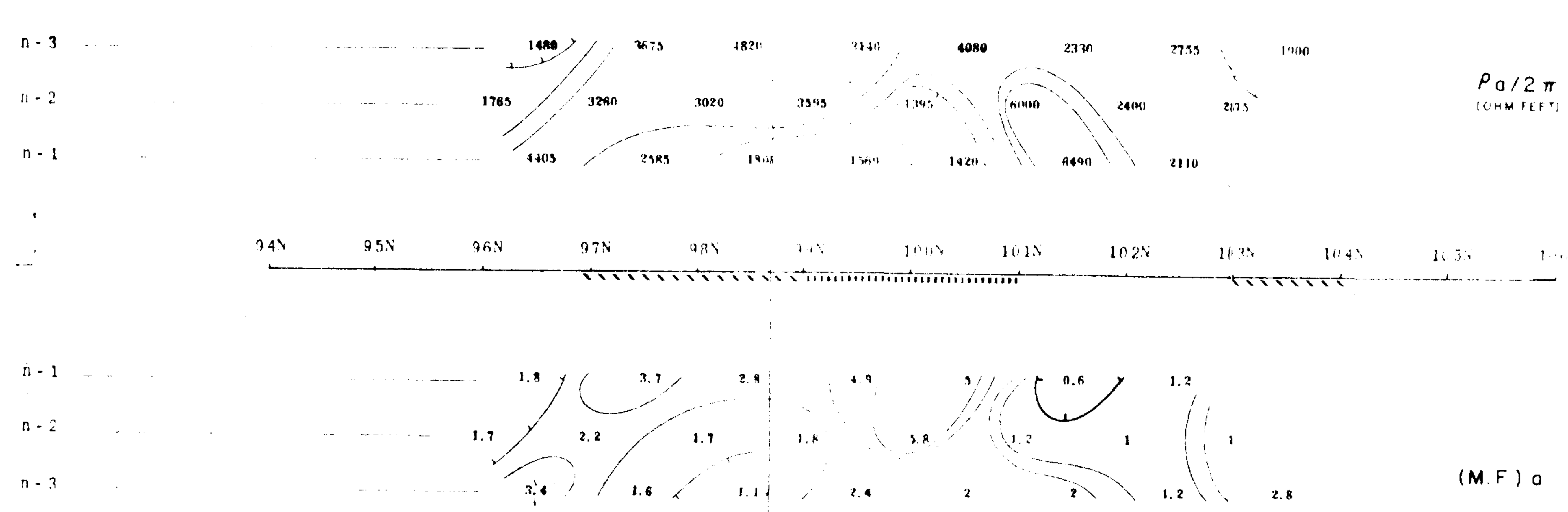
ELECTRODE CONFIGURATION

x - 100

PLOTTING POINT

McPHAR GEOPHYSICS LIMITED

INDUCED POLARIZATION AND RESISTIVITY SURVEY



LINE NO - 176E

STEEP ROCK IRON MINES LIMITED

BEIDELMAN BAY PROPERTY, STURGEON LAKE, PATRICIA M.D., ONTARIO.

Scale - One inch = 100 Feet

SURFACE PROJECTION OF ANOMALOUS ZONES

FREQUENCY

DATE SURVEYED

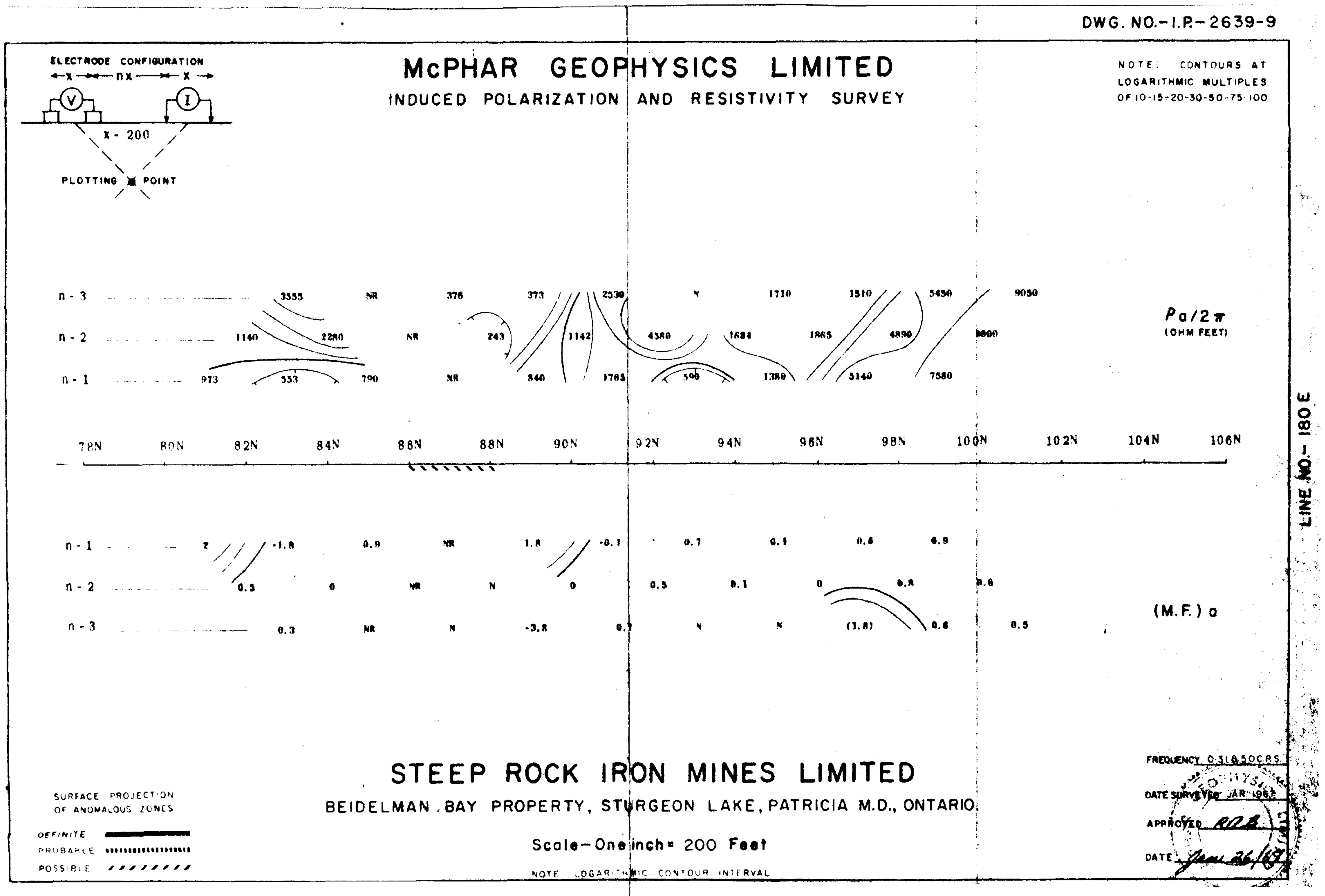
APPROVED R.A.B.

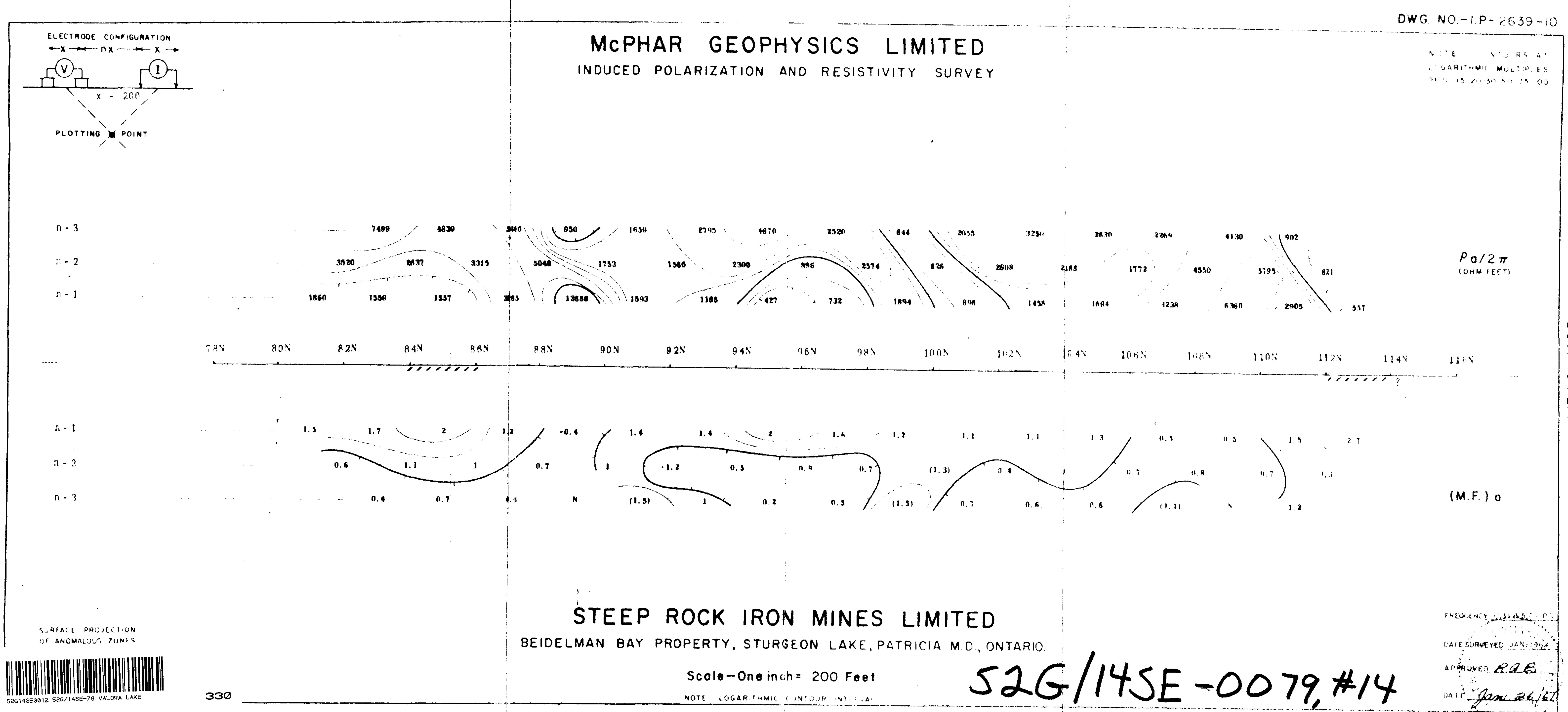
DATE Jan. 26/67

52G14SE0012 52G/14SE-79 VALORA LAKE

320

52G/14SE-0079, #13


DWG. NO.-I.P.-2639-9
ELECTRODE CONFIGURATION
x - 200
PLOTTING POINT
McPHAR GEOPHYSICS LIMITED
INDUCED POLARIZATION AND RESISTIVITY SURVEY
NOTE: CONTOURS AT LOGARITHMIC MULTIPLES OF 10-15-20-30-50-75-100
n - 3
n - 2
n - 1
Pa/2π (OHM FEET)
78N 80N 82N 84N 86N 88N 90N 92N 94N 96N 98N 100N 102N 104N 106N
LINE NO.- 180 E
(M.F.) a
STEEP ROCK IRON MINES LIMITED
BEIDELMAN BAY PROPERTY, STURGEON LAKE, PATRICIA M.D., ONTARIO
Scale-One inch= 200 Feet
NOTE LOGARITHMIC CONTOUR INTERVAL
SURFACE PROJECTION OF ANOMALOUS ZONES
DEFINITE
PROBABLE
POSSIBLE
FREQUENCY 0.31 & 5.0 C.P.S.
DATE SURVEYED JAN 1967
APPROVED R.A.B.
DATE Jan 26/67


DWG. NO.-I.P.-2639-10
ELECTRODE CONFIGURATION
x - 200
PLOTTING POINT
McPHAR GEOPHYSICS LIMITED
INDUCED POLARIZATION AND RESISTIVITY SURVEY
n - 3
n - 2
n - 1
Pa/2π (OHM FEET)
78N 80N 82N 84N 86N 88N 90N 92N 94N 96N 98N 100N 102N 104N 106N 108N 110N 112N 114N 116N
LINE NO.- 196 E
(M.F.) a
STEEP ROCK IRON MINES LIMITED
BEIDELMAN BAY PROPERTY, STURGEON LAKE, PATRICIA M.D., ONTARIO
Scale-One inch= 200 Feet
SURFACE PROJECTION OF ANOMALOUS ZONES
DATE SURVEYED JAN 1967
APPROVED R.A.B.
DATE Jan 26/67
52G/14SE-0079, #14
330