010

GEOCHEMICAL SURVEY

on the property of

CANADIAN ARROW MINES LIMITED

Halliday Township, Ontario

Timmins, Ontario,
December 24, 1970.

R. J. Bradshaw, P. Eng.,
Consulting Geologist.

INTRODUCTION

In conjunction with geological mapping, a programme of soil sampling was carried out on the Halliday Township property of Canadian Arrow Mines Limited.

This work was undertaken during the period October 26 to November 15, 1970, and is part of a programme to evaluate the base metal potential of the property.

PROPERTY, LOCATION AND ACCESS

The property consists of 38 contiguous claims located in Halliday Township, Ontario, numbered as follows: L 293567 to L 293576, inclusive; L 293396 to L 293400, inclusive; L 291995 to L 292001, inclusive; L 255462 to L 255464, inclusive; L 255466 to L 255468, inclusive; L 255472 to L 255478, inclusive; L 278569, L 278574, and L 292014.

Approximately 45 miles south of Timmins, Ontario, the property is situated in the northeast sector of Halliday Township.

The property is accessible by road or aircraft. By gravel road, it is 60 miles south from Timmins or 37 miles west from Matachewan. By aircraft, it is 40 miles from South Porcupine Lake to Campbell Lake on the property.

PREVIOUS WORK

The previous work carried out on the property and in the immediate area is well described in the geological report by Shield Geophysics Limited, dated December 24, 1970.

Probably the most important work was the conventional prospecting by Messrs. Larche and Rousseau leading to the discovery of two zinc-lead-silver occurrences on the property. These occurrences are described in the above mentioned geological report.

TOPOGRAPHY AND GENERAL GEOLOGY

Rock exposure comprises between 5 and 10 per cent of the grid area. A relief of up to 50 feet is present in a few areas. Otherwise the terrain is generally flat.

Approximately one-third of the area is covered by cedar-balsam-tag alder swamp. A virgin forest of red and white pine, cedar, birch, balsam and some spruce covers the remaining land area. The various streams and ponds on the property drain to the north into Campbell Lake.

The clay, sand and glacial deposits on the property are largely of glacial origin.

The geology of the property is described in the report by Shield Geophysics Limited, dated December 24, 1970. In general, the property is largely underlain by felsic volcanics including flows, tuffs and agglomerates. Shearing and schistosity is well developed in a northeasterly direction.

ECONOMIC GEOLOGY

As described in the geological report the property is a base metal prospect. Zinc-lead-silver mineralization has been found at two locations. At and within a few hundred feet of the base line at Station 0 is located the North Showing. The mineralization is present

in felsic volcanic rocks with varying textural and structural characteristics. To the southeast, about a half mile, a second seemingly less prominent occurrences, termed the South Showing, is present near Line 8 East, Station 30 South. Here, as described in the geological report the mineralization is present in a massive olive coloured rhyolite.

SURVEY RESULTS AND INTERPRETATION

The survey method is described in the Appendix to this report. The survey data is plotted and contoured on the accompanying maps at a scale of one inch to one hundred feet.

There are two areas on the property which are anomalous; a general area in the north-centre sector and a more specific area to the southeast. Both areas are related to base metal occurrences.

The north-central area consists of a series of zinc and copper anomalies between Lines 20W and 10E, a length of 3000 feet and between Stations 4N to 10S, a width of 1400 feet. Significantly, the length corresponds to the expected strike of the rocks. Within this area, copper anomalies are distributed along the shore of Two Lodge Lake and to the northeast in a related topographic low. The zinc anomalies have a less apparent relationship. They are mainly distributed northwest and northeast of the copper anomalies with or without related zinc highs. A zinc high, however, is situated immediately adjacent to the North Showing. The anomaly pattern suggests that the copper-zinc source may be within the topographic low trending northeasterly which is part of Two Lodge Lake.

The southeast area is characterized by one well defined zinc anomaly about 800 feet long and 200 feet wide several hundred feet southeast of Teddy Lake. Not only does the trend of the anomaly correspond with the strike of the rocks but the anomaly overlies the South Showing. It is most likely, therefore, that the source of the anomaly is zinc mineralization in rocks in the vicinity of the mineral showing.

CONCLUSIONS

Two anomalous areas have been indicated by the geochemical survey. In the centre of the property an area 3000 feet long and 1400 feet wide is characterized by several copper and zinc highs. The North Showing is spatially, if not genetically, related to this area. The source of copper appears to be below a topographic low marked by Two Lodge Lake. About a half mile to the southeast over the South Showing is located the other anomaly. Zinc unrelated to copper over a length of 800 feet and a width of 200 feet forms this anomaly. The well defined spatial relationship between the zinc anomaly and the South Showing indicates that the source of zinc is in the rocks below the anomaly.

To more effectively evaluate these anomalies and other areas within the grid, it is necessary that additional work be done prior to drilling.

RECOMMENDATIONS

To outline the anomalous zones in greater detail, it is proposed that samples in the vicinity of the anomalies be analyzed for zinc and copper. The cost of the analyses and redraughting is

estimated at $200.

Also, it is recommended that the present grid and intervening water-covered areas be covered by magnetic and electromagnetic surveys. Magnetic or electromagnetic anomalies may be so related to the geochemical anomalies that a drilling programme can be more effectively planned. Also, results from coverage of this limited area of the property will indicate the feasibility of coverage on the remaining portion of the property. Finally, the magnetic survey may assist in the geological interpretation of the property. The cost of this work is estimated at $2000.

There are geological conditions which may be designated for drilling at this time. However, a better determination of the scope and cost of the drill programme is expected on consideration of all field data. It is, therefore, proposed that an outline of the drill programme await the results of the geochemical analyses and geophysical work.

Respectfully submitted,

SHIELD GEOPHYSICS LIMITED,

R. J. Bradshaw, B.Eng.,
Consulting Geologist.

Timmins, Ontario,
December 24, 1970.

APPENDIX

SAMPLING PROCEDURE

An auger was used to extract a sample of soil approximately six inches below the bottom of the humus or muskeg. If sand or clay was not present, no sample was taken. In several instances the muskeg could not be penetrated by the soil auger or no sand or clay was present on the bedrock.

Individual samples were taken at picket-stations along blazed lines at 100 foot intervals.

ANALYTICAL PROCEDURE

Initially, those samples at 200 foot intervals were sent for analyses. In areas where anomalous readings were detected, the adjacent samples are analyzed.

Individual samples were dried, screened to 80 mesh, digested using hot acid and analyzed for copper and zinc using the atomic absorption method.

PLOTTING AND INTERPRETATION

The standard deviation formula was applied to the copper and zinc analyses as follows:

$$Sd = \sqrt{\frac{\Sigma (x - \bar{x})^2}{N - 1}}$$

Σ = sum
x = individual analyses in ppm
$\bar{x}$ = average of individual analyses in ppm
N = number of samples

For Zn:		For Cu:	
R =	21	R =	9
N =	368	N =	368
Sd =	16	Sd =	13

According to the formula an analyses greater than twice the standard deviation plus the mean of the analyses, in ppm, has a better than 95 per cent probability of being anomalous. Therefore, zinc values above 53 are anomalous and copper values above 35 are anomalous. These anomalous areas are indicated on the accompanying plans by shading.

020

MAGNETIC - ELECTROMAGNETIC SURVEY

on the property of

CANADIAN ARROW MINES LIMITED

Halliday Township, Ontario

Timmins, Ontario,
January 4, 1971.

R. J. Bradshaw, P.Eng.,
Consulting Geologist.

INTRODUCTION

Magnetic and electromagnetic surveys were carried out on a part of the Canadian Arrow Mines Limited property in Halliday Township, Ontario, during the period December 17 to 24th, inclusive, 1970.

This work was proposed as a result of geological and geochemical surveys conducted on the property in November, 1970.

The object of the exploratory work is to determine drill locations for possible copper-zinc sulphide deposits.

PROPERTY, LOCATION AND ACCESS

The property consists of 38 contiguous claims in Halliday Township, Ontario, numbered as follows: L 293567 to L 293576 inclusive; L 293396 to L 293400 inclusive; L 291995 to L 292001 inclusive; L 255462 to L 255464 inclusive; L 255466 to L 255468 inclusive; L 255472 to L 255478 inclusive; L 278569, L 278574, and L 292014.

The claim group is situated in the northeast sector of Halliday Township, approximately 50 miles south of Timmins, Ontario.

Most conveniently, the property is accessible by float or ski-equipped aircraft from South Porcupine to Campbell Lake on the property. Alternatively, a gravel road to the east end of Campbell Lake from Matachewan to the east or Timmins to the north provides access to the property.

PREVIOUS WORK

The present programme on the property includes a geological survey described in a report by F. Alexander B.Sc., December 24, 1970,

a geochemical survey described in a report by R. J. Bradshaw P.Eng., December 24, 1970, together with the geophysical survey described in this report. The object of this work is to provide locations to be investigated by drilling for base metal mineralization.

Prior to this project, initiated by the discovery of base metal-silver mineralization by Messrs. Laroche and Rousseau, there has been sporadic exploration in the area mainly for gold, since 1933. This work is well described in the geological report by Alexander (December 24, 1970).

GEOLOGY

Rock exposure forms between 5 and 10 per cent of the grid area. The report by F. Alexander of Shield Geophysics describes the geology of the property.

In general, the property is underlain by felsic volcanic rocks including flows, tuffs and agglomerates. Shearing and schistosity is well developed in a northeasterly direction.

Two base metal-silver occurrences are present on the property termed the North and South Showings. In each of these occurrences grey-white sphalerite is dominant with minor galena, pyrite, chalcopyrite and silver. The mineralization forms rather inconsistent grains, clots and seams in the rhyolitic host rock. For a more detailed description, the reader is referred to the geological report by Shield Geophysics dated December 24, 1970.

MAGNETIC SURVEY RESULTS AND INTERPRETATION

The magnetic survey data is plotted on the accompanying plan at a scale of one inch to two hundred feet and the instrument

and survey method is described in the Appendix to this report.

The magnetic background on the property ranges between 200 and 300 gammas and notable magnetic highs or lows are absent. The magnetic peak on the property is 455 gammas.

A magnetic low of -375 gammas at Station 1+50N, Line 2 West may represent an unnatural metal article.

The small generally oval-shaped magnetic highs seem to form linears, but lack the necessary definition to assist in the interpretation.

The magnetic susceptibilities tend to confirm that the area surveyed is dominantly underlain by rhyolitic rocks of uniformly low magnetic susceptibilities. Moreover, if sulphide concentrations are present, the mineralization is not associated with any large concentration of magnetic minerals.

ELECTROMAGNETIC SURVEY RESULTS AND INTERPRETATION

The Ronka EM 16 survey results are plotted on the accompanying plan at a scale of one inch to two hundred feet. The survey method and instrument is described in the Appendix to this report.

Quite a large number of conductive zones are indicated within the area surveyed. Those which are considered to be of probable bedrock origin are designated A to N inclusive. These vary in length from a few hundred to 1400 feet and strike generally northeast. In a few instances, there appears to be a relationship between a small increase in magnetic susceptibilities and the conductive zones.

Conductors A to N inclusive may be caused by massive or disseminated sulphides or a form of shearing.

CONCLUSIONS

The magnetic relief on the property is very slight, a characteristic of the rhyolitic type rocks expected to underlie the area. A large number of conductive zones have been detected by the Ronka EM 16 survey. Designated A to N inclusive, these conductors are thought to be caused by bedrock characteristics including non-magnetic massive or disseminated sulphides or forms of shearing.

Those conductive zones particularly which are associated with other features, including sulphide occurrences, or geochemical anomalies merit further attention. Diamond drilling and detailed electromagnetic surveys are proposed for investigating the anomalies. This work is outlined in detail, taking into consideration all work so far carried out on the property, in the Appendix to this report.

Respectfully submitted,

SHIELD GEOPHYSICS LIMITED,

R. J. Bradshaw, P.Eng.
Consulting Geologist.

REGISTERED PROFESSIONAL ENGINEER
R. J. BRADSHAW
PROVINCE OF ONTARIO

Timmins, Ontario,
January 4, 1971.

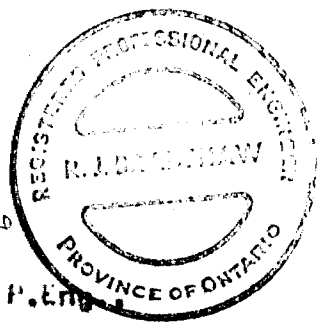
C E R T I F I C A T E

I, Ronald J. Bradshaw, residing at 460 Howard Street, Timmins, Ontario, a consulting geologist with office at 26 Pine Street South, Timmins, Ontario, do hereby certify that:

I attended Queen's University, Kingston, Ontario, and graduated with an Honours B.A. degree in Geological Sciences in 1958.

I am a Fellow of the Geological Association of Canada, a Member of the Canadian Institute of Mining and Metallurgy and of the Association of Professional Engineers of the Province of Ontario.

I have no interest either directly or indirectly in the shares or securities of Canadian Arrow Mines Limited.



Timmins, Ontario,
January 4, 1971.

R. J. Bradshaw, P.Eng.
Consulting Geologist.

APPENDIX I

CANADIAN ARROW MINES LIMITED

RECOMMENDATIONS FOR DIAMOND DRILLING

The recommendations to follow are based on all work completed to date on the Canadian Arrow property, including geological mapping, trenching, assaying, geochemical and geophysical surveys.

The following drill holes are proposed:

Hole No.	Location	Direction	Dip	Depth	Target
71-1	Line 0 St. 1+80S	grid-S	45°	420'	North Showing
71-2	Line 12W St. 4+00S	grid-S	45°	630'	D conductor
71-3	Line 0 St. 2+10S	grid-S	45°	300'	G conductor
71-4	Line 6E St. 10+50S	grid-S	45°	300'	H conductor
71-5	Line 4E St. 4N	grid-S	45°	300'	N conductor
71-6	Line 28W St. 1+60N	grid-S	45°	340'	A conductor
71-7	Line 8E St. 27+00S	grid-S	45°	425' 2715'	South Showing

The drilling of holes 71-1, 2, 3 and 7 is strongly recommended. Hole 71-1 will provide a continuous section below the North Showing showing the grade, continuity and type of mineralization which might be expected in covered areas of the property. Holes 71-2 and 3 are located to investigate multiple conductor D and conductor G, both of which are moderately strong.

Moreover, they are a comparatively short distance from the North Showing and are spatially related to anomalous copper values in soil samples. Hole 71-7 is located to investigate the South Showing and coinciding zinc anomaly.

A little less priority applies to holes 71-4, 5 and 6. Hole 4, located to investigate a strong conductor, namely M, is also situated near an area containing high copper and zinc values in the soil. Conductor N which is strong and situated just north of the North Showing is to be investigated by hole 71-5. Hole 71-6 is located to investigate multiple conductive zone A.

To more properly schedule this drilling and the investigation of other conductive zones, it might be advantageous to carry out a limited amount of detailed electromagnetic work using the Crone JEM unit. The survey criteria from this survey enables a much more reliable classification of the various conductors and their probable cause. The supervising geologist and an assistant could carry out this work in a few days at a small cost.

Estimated cost of the drill programme including supervision and assaying is approximately $25,000.00

Respectfully submitted,

SHIELD GEOPHYSICS LIMITED

R. J. Bradshaw, P. Eng.,
Consulting Geologist.

REGISTERED PROFESSIONAL ENGINEER
R. J. BRADSHAW
PROVINCE OF ONTARIO

Timmins, Ontario,
January 7, 1971.

APPENDIX II

SURVEY METHOD AND INSTRUMENT DATA

Electromagnetic Survey

A Ronka EM 16, number 35, was used for the survey.

This instrument is simply a sensitive receiver covering the frequency of the new VLF-transmitting stations with means of measuring the vertical field components. The VLF-transmitting stations operate for communications with submarines at frequencies between 17.8 and 24.0 Khz. The vertical antenna current of these transmitting stations creates a concentric horizontal magnetic field around them. When these magnetic fields meet conductive bodies in the ground, there will be secondary field radiating from these bodies. This equipment measures the vertical components of these secondary fields.

The receiver has two inputs, with two receiving coils built into the instrument. One coil has a normally vertical axis and the other is horizontal.

The signal from the coil with vertical axis is first minimized by tilting the instrument. The tilt angle is calibrated in percentages. The remaining signal in this coil is finally balanced out by a measured percentage of signal from the other coil.

After a suitable station is selected, at right angles to the direction of the survey lines, readings are made of the in-phase and quadrature components where the signal has been minimized to its greatest degree. The VLF-transmitting station at Seattle, Washington was used for the survey.

The lower end of the handle will, as a rule, point towards the conductor and the instrument is so calibrated that when approaching a conductor, the angles are positive in the in-phase component.

As with any electromagnetic unit, the largest and best conductors give the highest ratio of the in-phase and quadrature components.

Magnetic Survey

A Sharpe M.F.-1 fluxgate magnetometer was used in the magnetic survey. This instrument measures the vertical component of the earth's magnetic field in gammas. Base stations for determining the magnetic diurnal variations were established along the main base line at 100 foot intervals. Magnetic readings were taken at 50 foot intervals, along the cross lines.

GEOLOGICAL SURVEY

on the property of

CANADIAN ARROW MINES LIMITED

Halliday Township, Ontario

Timmins, Ontario,
December 24, 1970.

F. J. Alexander, B.Sc.,
Consulting Geologist.

TABLE OF CONTENTS

INTRODUCTION

The Canadian Arrow property is a base metal prospect. Two zinc-lead occurrences have recently been discovered within the claim group by conventional prospecting.

During the month of November, 1970, a geological survey was performed over 13 miles of picket line, located in the central portion of the Canadian Arrow Mines Limited property in Halliday Township, Larder Lake Mining Division, Ontario. In conjunction with the survey, some rock trenching was completed to provide fresh rock samples for assaying. Soil sampling, carried out at the same time, is described in a separate report. The geochemical report also includes certain recommendations based on the geological and geochemical data interpretation.

The object of the present programme is to evaluate these occurrences and assist in the discovery of ore mineralization.

PROPERTY, LOCATION AND ACCESS

The property consists of thirty-eight contiguous claims, in Halliday Township, Ontario, numbered as follows: L 293567 to L 293576 inclusive; L 293396 to L 293400 inclusive; L 291995 to L 292001 inclusive; L 255462 to L 255464 inclusive; L 255466 to L 255468 inclusive; L 255472 to L 255478 inclusive; L 278569, L 278574 and L 292014.

Adjoining the Halliday-Midlothian Township line to the east, the property occupies an area just north of the east central portion of the township.

The property may be reached by gravel road south from Timmins approximately 60 miles or west from Matachewan approximately 37 miles.

Most convenient access to the property is by float or ski-equipped aircraft from South Porcupine, approximately 40 miles to the north of Campbell Lake.

PREVIOUS WORK

Reports of work performed in the area examined by the writer date back to 1933 when P. H. Silems trenched a vein (shear zone) on his four claims located between Campbell Lake and the east township line.

The shear zone, approximately 700 feet long, and 6 to 20 feet wide, strikes north 75° east and dips vertically. Low gold assays are reported with up to 9 oz. silver and over 2.5% copper. This shear zone is apparently in the same area as the North Showing (See Economic Geology).

In 1945, G. L. Holbrooke investigated the area immediately north of the present property for Sylvanite Gold Mines Limited. He reported a large amount of trenching done on several carbonatized zones within the sedimentary rock types of the area.

In 1952, W. S. Savage from the Department of Mines reported on the six Lamothe Claims, immediately north of the Silems Claims. He noted that some stripping and shallow blasting had been done on an outcrop of coarse rhyolite breccia in this area. Samples

taken are described as containing black sphalerite and disseminated pyrite in a siliceous matrix and assaying a maximum of $6.00 per ton gold and 2% zinc.

In 1964, Halliday Mines Limited contracted a geological survey with Sylmac Exploration Services Limited under J. F. Lill, on 24 contiguous claims covering a small portion of the west end of the present grid as indicated on the geological plan (west sheet). A magnetometer survey over six lines (0 to 10W) reveals that the magnetic susceptibilities of the area are low. Three holes were drilled in the area covered by the present grid and a fourth into the southwestern bay of Campbell Lake (viz. Appendix for logs). No gold or silver values were obtained from samples taken during the programme.

Stairs Mining and Exploration Company, during 1965, drilled three holes on their property, which included the northwestern sector of the township from Campbell Lake to the north and east boundaries. One hole is located on the island in the southern portion of Campbell Lake and the other two were drilled south into Bowl Lake from its north shore (viz. Appendix for logs). All three holes apparently penetrated the marcasite/graphite zone characteristic of the sedimentary-volcanic contact running approximately northeastward across the lower portion of Campbell Lake.

In addition to the above reports on file at the Kirkland Lake office of the Ontario Department of Mines, two surveys of the area have been performed by that department including "Grassy River

Area" by T. L. Gledhill (Vol. XXXV Pt. 6, O.D.M. Annual Report, 1926, Geological Map 35j) and the latest, "Geology of Halliday and Midlothian Townships" by E. G. Bright (O.D.M. Geological Report 79, 1970, Map 2187).

Prospecting by Messrs. Larche and Rousseau constitutes the most recent work in the area, culminating in the discovery of the North and South Showings described under the heading Economic Geology.

GENERAL GEOLOGY

The area examined is underlain almost wholly by Precambrian felsic volcanics and their derivatives. Northeast of the grid area is an area underlain by Precambrian metasediments, mainly interbedded conglomerate, arkose, greywacke, slate and minor felsic metavolcanic rocks of Temiskaming age.

The stratigraphic table is as follows: (O.D.M. Geological Report 79, P.4)

TABLE OF LITHOLOGIC UNITS

CENOZOIC

RECENT
Swamp and stream deposits

PLEISTOCENE
Sand, gravel, and silt

Unconformity

PRECAMBRIAN

PROTEROZOIC

LATE MAFIC INTRUSIVE ROCKS ("NIPISSING")
Diabase

Intrusive Contact

HURONIAN

COBALT GROUP (GOWGANDA FORMATION)

Greywacke and pebble greywacke, quartzite, conglomerate, argillite, and arkose

Unconformity

ARCHEAN

MAFIC INTRUSIVE ROCKS

Diabase

Intrusive Contact

FELSIC INTRUSIVE ROCKS

Granite and feldspar porphyry (dikes)

Intrusive Contact

ULTRAMAFIC AND MAFIC INTRUSIVE ROCKS

Serpentinite, peridotite, dunite and pyroxenite, gabbro and diorite

Intrusive Contact

METASEDIMENTS*

Conglomerate, greywacke, arkose, slaty argillite, graphitic tuff and slate, green "carbonate" rock and minor intermediate pyroclastic rocks

Disconformable and Interfingering Contact

INTERMEDIATE AND MAFIC METAVOLCANICS**

Andesitic to dacitic breccias, tuffs, agglomerates, breccias, and flows, amygdaloidal and pillowed andesite, graphitic tuff and slate, and massive basalt

FELSIC METAVOLCANICS**

Rhyolitic to dacitic flows, breccias and tuffs, massive and amygdaloidal rhyodacite, graphitic tuff and slate

* Some metavolcanics are younger than the metasediments.

** The metavolcanics are interstratified, but felsic metavolcanics predominate in the lower part of the stratigraphic succession.

Outcrop comprises between five and ten per cent of the grid area. While much of the area is flat, a substantial portion exhibits relief of up to 50 feet.

Approximately one third of the area is covered by cedar-balsam-tag alder swamp. The remaining land surface is covered by

a virgin forest of red and white pine, cedar, birch, balsam and some spruce. Butt diameters of the pine and cedar may exceed four feet.

GEOLOGY

Most of the area examined is underlain by Archean felsic metavolcanics. An arenaceous conglomerate was encountered at the north end of Lines 18W and 20W, and a fine grained massive to schistose silicic andesite was observed near Line 32W on the tie line, west of Station 6S Line 28W and on Base Line 33S at 5W.

The rhyolites of the area have been assigned to three classes. The first, typical of the area, is light olive to bluish green to light grey in colour, highly siliceous, semi-translucent, frequently with a pearly lustre, massive to schistose and sericitic, with a quite homogeneous texture, and over much of the area, possessing an extremely fine scattering of nearly microscopic crystals of pyrite. Occasionally, close fractures are filled with glassy quartz and, not infrequently, minute shards of chloritic material are present.

The host rock of the mineral occurrence at Line 0, Station 0 is typical of the second rhyolite type. It is a light to medium olive colour, strongly brecciated, with a large proportion of quartz and chert in the form of stringers, veins and inclusions up to two inches in diameter. Orange-pink to red staining is common and associated with an increase in pyrite content, up to 20 per cent, from an average of about 2 per cent, particularly in the region

immediately southeast of Teddy Lake.

The third rhyolite type is an inhomogeneous medium to coarsely granular agglomerate, usually medium olive to flesh red in colour.

The rock termed rhyodacite is highly siliceous, generally medium blue-green to a dirty grey-green in colour, frequently very inhomogeneous in texture with a quite variable grain size.

Dacite takes the form of medium to dark-blue green very fine grained rock which may be quite homogeneous. Almost glassy, at Station 5+50N on Line 4E, it varies to a dark green-black amygdular variety with a very fine grained matrix and amygdules of light coloured dolomite up to three millimetres in diameter. Slight to moderate preferred amygdule orientation is present.

The andesite encountered in the area is a very dark green to a dirty greenish black, siliceous and finely equigranular to moderately amygdular rock. The amygdules are filled with quartz and dolomite.

The diorite (quartz-rich diabase) encountered in the northeastern portion of the grid has an aphanitic very dark ground mass about very fine glassy quartz phenocrysts. Contrasted with the other massive to schistose rock types the diorite is typically massive.

Weathering in the area produced a uniform buff to light brown colouring with occasional rusty patches on outcrops of rhyolite, rhyodacite and dacite. The andesite weathers a darker

greenish grey similar to the diorite.

STRUCTURAL GEOLOGY

Structurally, the area is quite complex. Most of the rocks are strongly sheared and subsequently cross faulted. The direction of shearing closely parallels the northeasterly striking schistosity. A series of north-northeasterly trending faults offset the sheared and schistose rocks. No lateral movement has been observed in relation to the faults or shear zones although two of the north-northeasterly faults southeast of Teddy Lake appear to be right handed.

A contoured equal area plot of some 300 joint set measurements, shown on Figure 1, indicates generally steeply dipping to vertical complementary joint system with general set directions of 070°, 109°, 155° and 195°.

ECONOMIC GEOLOGY

General

Approximately 35 representative grab samples were taken from various fresh rock faces on the property prepared by blasting. Most of the samples are from the North and South Showings as described below. All samples were assayed for gold, silver, zinc, and lead.

As expected, the zinc content was high with heavy sulphide mineralization. Also, a rather high silver background was noted in the samples, averaging 0.05 oz. in the absence of other metals. The assay results are fully documented in the Appendix to this report.

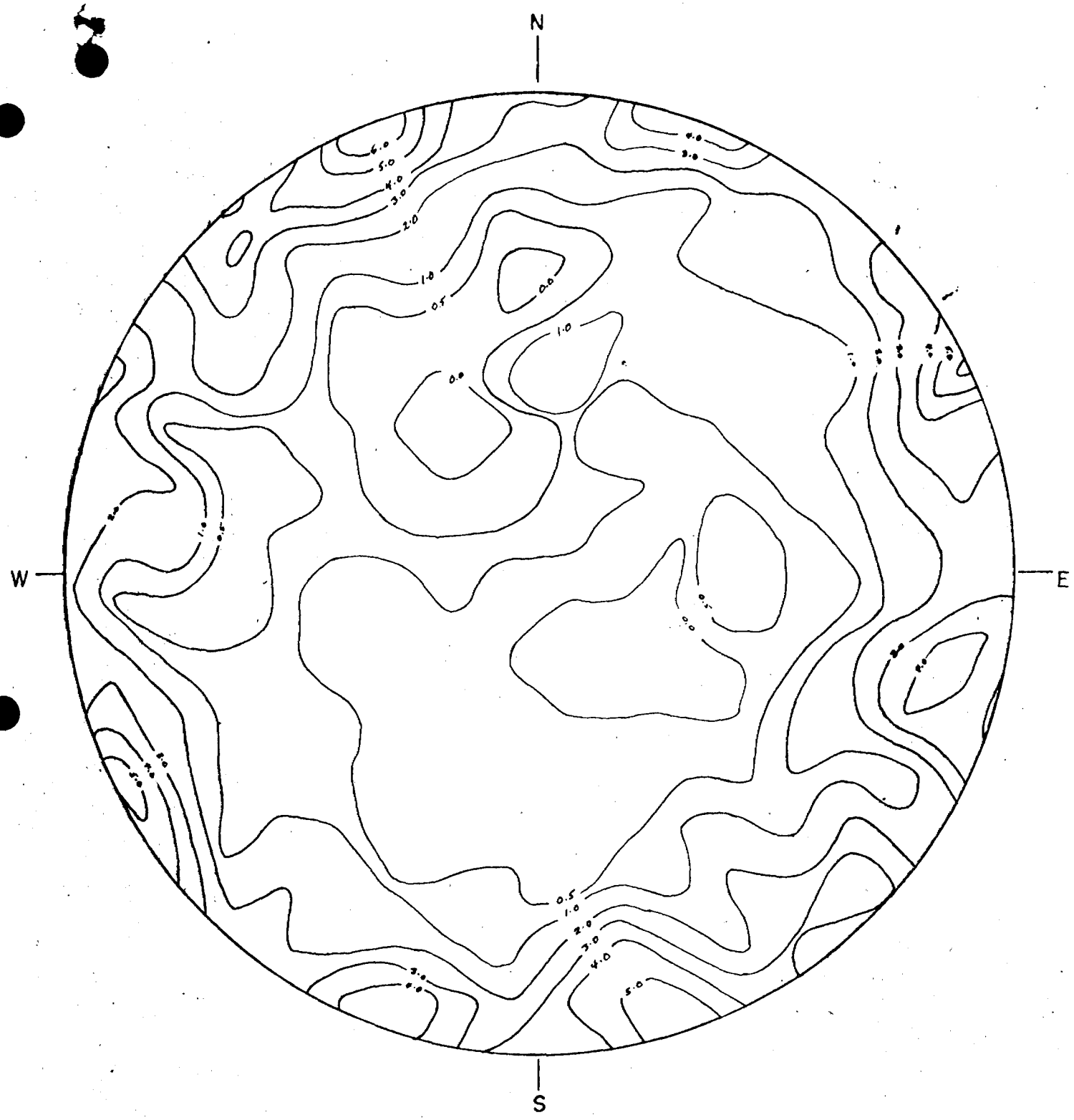


Figure 1 : Equal area upper hemispheric plot of the poles of 300 joint measurements - percentile contours.

North Showing

The north zinc-lead showing is an area approximately 200 feet by 100 feet extending north from the baseline at Line 0. The rock types encountered varied from a massive light green rhyolite to a dark grey rhyodacite and a dark green amygdaloidal dacite. Rhyolite is the dominant rock type, either massive or a cherty agglomerate, usually brecciated and quartz veined. A small dacite inlier was found approximately 80 feet north of the baseline while rhyodacite appears further north. The rhyolite-dacite contact zone is characterized by subrounded to rounded light green rhyolite inclusions in a dark green amygdaloidal dacite.

Three narrow shears were observed; the first exposed at the western end of the large baseline outcrop at Line 0, striking 043°, dipping 65° southeast, the second and third approximately 2½ feet apart, exposed in a trench, cut across the rhyolite-dacite contact zone. The latter two shears are approximately one foot wide, strike approximately 070° and dip 80° north.

The mineralization occurs within and adjacent to the shears in the form of veins, stringers, breccia filling and streaky disseminations. A peculiar grey-white, iron-free sphalerite is the main economic mineral, usually accompanied by minor amounts of galena and chalcopyrite as well as moderate pyrite. The host rock pyrite content varies from about 2 per cent to 25 per cent in parts of the showing area.

Twenty-four representative grab samples were taken in the showing area and assayed for zinc, lead, silver and gold. Low or nil values were returned for most of the samples. The highest assay returned 7.65 per cent zinc, 0.32 per cent lead, 0.29 per cent silver and trace gold. An abnormally high silver content in all samples was noted (see Appendix for assays).

The highest assay values were returned by the sphalerite-rich shear in the rhyolite-dacite contact zone. Three samples over a distance of 50 feet returned zinc assays of 7.65 per cent, 4.35 per cent and 4.30 per cent. Values returned from the pyritic shear parallel to it were much lower.

A series of popholes were blasted at roughly 10 feet intervals between the rhyolite-dacite contact zone and the base-line outcrop. Eight samples were assayed, also for zinc, lead, silver and gold. No more than trace amounts of zinc or lead were found, most of the samples being quite pyritic.

South Showing

The South Showing is located southeast of Teddy Lake on Line 6 East. Two relatively small areas have been stripped and exposed by blasting.

The smallest area is located approximately 25 feet west of Station 30 South. The area opened up is approximately 6 feet by 3 feet wide. Mineralization occurs as a quartz-sphalerite-pyrite-galena filling in a coarse olive green rhyolite breccia.

The second area, located at Station 29+25 South, is approximately 100 feet long by 10 feet wide. Mineralization occurs here as veins of quartz containing sphalerite, galena, pyrite, some chalcopyrite and a minor amount of carbonate in an olive coloured rhyolite.

The lack of values from samples taken close to both mineralized zones indicates the uneven distribution of ore minerals in the rhyolite.

CONCLUSIONS

As a result of the discovery of zinc-lead mineralization, a programme of exploration was initiated on the Canadian Arrow property in Halliday Township.

The geological survey described in this report indicates that the central portion of the property is dominantly underlain by rhyolitic type rocks, which are sheared and schistose in a north-east direction. North-northeast striking cross faults follow topographic lows and are indicated by joints and shearing in the rock exposures.

Zinc-lead-silver mineralization is present on the property in two different locations. The mineralization is characterized by abundant iron-free grey-white sphalerite and quartz in rhyolitic rocks that contain much chert as veinlets and inclusions. Moderate dolomite, pyrite and slight chalcopyrite are associated with the mineralization. Neither mineral occurrence as determined by careful observations, blasting and sampling, appears to contain sufficient valuable metals to be of economic importance. However,

these mineral occurrences and the relatively high silver background in the rhyolitic rocks do indicate that other larger deposits may be present in the area. The geochemical survey and the geophysical work presently in progress will assist in determining those covered areas with potential importance for base metal-silver mineralization.

Further investigation of the property should involve diamond drilling and detailed electromagnetic survey work. Recommendations concerning this work are presented in the Appendix to this report and are based on all geological, geochemical and geophysical work completed to date.

Respectfully submitted,
SHIELD GEOPHYSICS LIMITED,

F. J. Alexander, B.Sc.,
Consulting Geologist.

Timmins, Ontario,
December 24, 1970.

APPENDICES

APPENDIX I

CANADIAN ARROW MINES LIMITED

RECOMMENDATIONS FOR DIAMOND DRILLING

The recommendations to follow are based on all work completed to date on the Canadian Arrow property, including geological mapping, trenching, assaying, geochemical and geophysical surveys.

The following drill holes are proposed:

Hole No.	Location	Direction	Dip	Depth	Target
71-1	Line 0 St. 1+80S	grid-S	45°	420'	North Showing
71-2	Line 12W St. 4+00S	grid-S	45°	630'	D conductor
71-3	Line 0 St. 2+10S	grid-S	45°	300'	G conductor
71-4	Line 6E St. 10+50S	grid-S	45°	300'	H conductor
71-5	Line 4E St. 4N	grid-S	45°	300'	N conductor
71-6	Line 28W St. 1+60N	grid-S	45°	340'	A conductor
71-7	Line 8E St. 27+00S	grid-S	45°	425' 2715'	South Showing

The drilling of holes 71-1, 2, 3 and 7 is strongly recommended. Hole 71-1 will provide a continuous section below the North Showing showing the grade, continuity and type of mineralization which might be expected in covered areas of the property. Holes 71-2 and 3 are located to investigate multiple conductor D and conductor G, both of which are moderately strong.

Moreover, they are a comparatively short distance from the North Showing and are spatially related to anomalous copper values in soil samples. Hole 71-7 is located to investigate the South Showing and coinciding zinc anomaly.

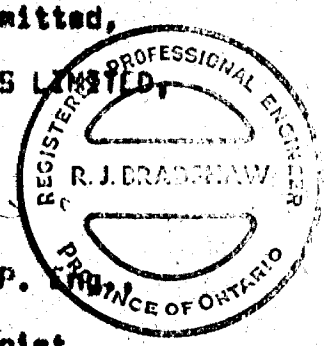
A little less priority applies to holes 71-4, 5 and 6. Hole 4, located to investigate a strong conductor, namely H, is also situated near an area containing high copper and zinc values in the soil. Conductor N which is strong and situated just north of the North Showing is to be investigated by hole 71-5. Hole 71-6 is located to investigate multiple conductive zone A.

To more properly schedule this drilling and the investigation of other conductive zones, it might be advantageous to carry out a limited amount of detailed electromagnetic work using the Crone JEM unit. The survey criteria from this survey enables a much more reliable classification of the various conductors and their probable cause. The supervising geologist and an assistant could carry out this work in a few days at a small cost.

Estimated cost of the drill programme including supervision and assaying is approximately $25,000.00.

Respectfully submitted,

SHIELD GEOPHYSICS LIMITED,



R. J. Bradshaw, P. Eng.,
Consulting Geologist.

Timmins, Ontario,
January 7, 1971.

P. O. BOX 550

APPENDIX II

TEL. 824-4337 – 824-3872

Val d'Or, Que., December 10 19 70

BOURLAMAQUE ASSAY OFFICE

REG'D.
J. C. JENSEN, PROPRIETOR

MEMBER CANADIAN TESTING ASSOCIATION

Certificate of Analysis

No. 23070

Identification: 33Au 33Ag 33Zn 33Pb Samples of: core,

Received from: Dec.6,by express Date Received:

Shield Geophysics Ltd., with the following results:

Sample No.	Au	Ag	Zn	Pb%
z-1	Trace	0.21	0.65	Nil
z-2	Tr.	0.20	0.75	0.08
z-3	Tr.	0.16	4.35	0.10
z-4	Tr.	0.15	4.30	Tr.
z-5	Tr.	0.07	0.30	Nil
z-6	Tr.	0.15	Tr.	Nil
z-7	Nil	0.02	Nil	Nil
z-8	Tr.	0.03	Nil	Nil
z-9	Tr.	0.06	Nil	Nil
z-10	Tr.	0.02	Nil	Nil
z-11	Tr.	0.29	7.65	0.32
z-12	Nil	0.02	Tr.	Nil
z-13	Tr.	0.15	0.40	Nil
z-14	Tr.	0.05	Nil	Nil
z-15	Tr.	0.03	Nil	Nil
z-16	Nil	0.02	Nil	Nil
z-17	Nil	0.06	Nil	Nil
z-18	Tr.	0.02	Tr.	Nil
z-19	Nil	0.06	Nil	Nil
z-20	Nil	0.03	Tr.	Nil
z-21	Tr.	0.04	Nil	Nil
z-22	Nil	0.02	Tr.	Nil
z-23	Nil	0.01	Tr.	Nil
z-24	Tr.	0.04	Tr.	Nil
25 (y-1)	Nil	0.01	Tr.	Nil
230 (y-2)	Nil	0.06	Nil	Nil
231 (y-3)	Tr.	0.07	Nil	Nil
232 (y-4)	Nil	0.02	Nil	Nil
233 (y-5)	Nil	0.03	Nil	Nil
234 (y-6)	Nil	0.02	Nil	Nil
235 (PH-1)	Tr.	0.20	Nil	Nil
236 (PH-2)	Nil	0.02	Tr.	Nil
237 (PH-3)	Nil	0.02	Nil	Nil

Assayer.

APPENDIX III

Previous Diamond Drilling

Stairs Exploration & Mining Company

DDH 2 - 65 Dip 60° Depth 253' Bearing 180° March/65 Logged by R. J. Roach

0	- 40	Boulders/casing
40	- 91	Sand and boulders
91	- 175	Greywacke - fine grained carbonaceous black, fine sedimentary pyrite through sections, well bedded.
175	- 253	Carbondate zone - grey, graphitic, very badly broken up contained heavy - massive marcasite, section very soft.

DDH 3 - 65 Dip 60° Depth 472' Bearing 180°

0	- 32	Casing
32	- 148.6	Gritstone - dark grey with well defined small angular rhyolite pebbles, lightly siliceous sections carries abundant spheroids of marcasite.
		67 - 75 vuggy, rusty, probably water course
148.6	- 159.0	Greywacke - black, fine grained with fine sedimentary pyrite disseminated through section.
		151 - 151.2 quartz with some cube pyrite
159.0	- 219.1	Gritstone as above
		214.3 - 214.5 massive marcasite
219.1	- 237.4	Intrusive - light greenish grey, medium green massive probably a diorite
237.4	- 247.2	Arkose - siliceous light buff - some bedding, contains angular light fragments (green), fine disseminated pyrite through section (fragments probable shards of chlorite)
247.2	- 259.0	Gritstone - as above with some disseminated pyrite through section
259.0	- 283.0	Greywacke - black, well bedded, carbonaceous, occasional small quartz stringer
283.0	- 472.0	Carbonate Zone - dark grey, graphitic with section containing massive marcasite, lightly brecciated
		287 - 308 centre of sulphide zone

DDH CL 1 - 65 Loc'n 5 chains N & 4 chains E P2, Cl. #37538, Dip 45° Depth 606' Bearing N 3° E

0	- 10	Casing
10	- 189	Arkose, carbonated - light grey, fine grained, siliceous saccharoidal and patches massive marcasite
		75 - 100 light brecciation to marcasite replacement of matrix
189	- 275	Breccia - carbonated - rhyolite light grey, hard, siliceous, almost charty in sections
		250 - 275 occasional section heavy marcasite
275	- 282	Sulphide - marcasite, massive, coarse
282	- 296	Intrusive - carbonated, black with white phenocrysts of quartz and/or feldspar
296	- 308.6	Sulphide - 30% in rhyolite breccia, marcasite only
308.6	- 309.3	Quartz - white to massive coarse marcasite on both contacts.
309.3	- 540	Breccia - rhyolite to marcasite replacement of matrix up to 80% in some sections
		340 - 412 Extremely heavy marcasite in sheared graphite zone, possibly centre of sulphide zone
		375 - 491 Sulphide zone 30% marcasite
		425 - 459 45% marcasite
		459 - 473 Carbonate zone, grey, siliceous, interwoven quartz and carbonate stringers
		473 - 492 Marcasite, graphite, light shearing
		492 - 533 Carbonate zone light grey, fine-medium green
		533 - 534 Quartz white with some marcasite on contacts
		534 - 554 Carbonate zone with up to 90% marcasite replacement between 550 - 554
540	- 559	Breccia Zone - Quartz carbonate pinkish to white, ground badly broken, contact between sulphide and greywacke
559	- 606	Sediments - Interbedded greywacke and light grey arkose, occasional very narrow quartz stringer

HALLIDAY MINES LIMITED

DDH 2 Depth 250' Dip 45° Strike S 45° E Loc'n 5+80W 1+75N

0.0	Casing
18.0	Rhyolite, siliceous, grey-green
21.0	Tuff rhyolite, siliceous, light grey-green, chloritic fragments throughout
	79 - 80 chloritized and carbonated
	83 - 84
	71 - 75 split core
	125 - 128
	186 - 186.5 weak fine pyrite in breccia
	200 - 250 split core with scattered sections of milky white quartz
250	End of hole.

DDH 3 Depth 287' Angle 45° Strike 5°E Loc'n 3+80W 0+70N

0.0	Casing
5.0	Rhyolite, massive, grey, charty
15.0	Milky white quartz, minor scattered pyrite, core split
25.6	Rhyolite as above, scattered milky quartz veins
	36.0 - 36.2 fine grained dike at 30° c.a.
51.0	Rhyolite as above but with chlorite speckling
71.5	Rhyolite agglomerate, gradational from above, light siliceous fragments in grey siliceous matrix
105.0	Rhyolite 110 - 115 core split
239.0	Quartz breccia, minor pyrite
240.6	Rhyolite
	Lost core - 243 - 245, 247 - 250, 250.6 - 252, 270.5 - 273.3
282.0	Conglomerate, large rhyolite pebbles (up to 2") in quartz matrix, some pyrite replacement of pebbles
287.0	End of hole.

DDH 4 Depth 293' Angle 45° Strike SE Coords 2+40W 0+60S

0.0	Casing
10.0	Rhyolite, charty, some scattered rusty sections
39.0	Quartz breccia
44.0	Rhyolite
98.7	Rhyolite tuff contact at 40° c.a., grey-green, siliceous
263.0	Lost core
266.0	Agglomerate
293.0	End of hole.

PERFORMANCE & CO'

900

ASSESSMENT WORK DETAILS

Township or Area: Halliday Twp.

Type of Survey: Magnetic
A separate form is required for each type of survey

Chief Line Cutter or Contractor: P. Godin
Name
434 Main St. Timmins, Ont.
Address

Party Chief: C. Campsall Shield Geophysics Ltd.
Name
26 Pine St. S. Timmins, Ont.
Address

Consultant: R. J. Bradshaw Shield Geophysics Ltd.
Name
26 Pine St. S. Timmins, Ont.
Address

COVERING DATES

Line Cutting: Oct. 21 - Nov. 8, 1970

Field: Dec. 17 - Dec. 24 1970
Instrument work, geological mapping, sampling etc.

Office: Dec. 24, 1970 - Jan. 4, 1971

INSTRUMENT DATA

Make, Model and Type: Sharpe MF-1

Scale Constant or Sensitivity: 1 or - 10 gammas
Or provide copy of instrument data from Manufacturer's brochure.

Radiometric Background Count: _____

Number of Stations Within Claim Group: 780

Number of Readings Within Claim Group: 1560

Number of Miles of Line cut Within Claim Group: 15

Number of Samples Collected Within Claim Group: _____

CREDITS REQUESTED	20 DAYS per claim	40 DAYS per claim	Includes (Line cutting)
Geological Survey	☐	☐	
Geophysical Survey	☒	☒	Show Check ✓
Geochemical Survey	☐	☐	

DATE: March 25, 1971

SIGNED: [signature]

255462 ¼ not covered
255463 ¼
255464
255467 ¼
255468
255472 ¼
255474
255475 ½
291997
291998

Area of claims not covered = 1 3/4

RECEIVED
MAY 3 1971
PROJECTS SECTION

10 X 20 = 200 ÷ (10+1)
= 18.18 days per claim

If space insufficient, attach list

TOTAL: 10 claims

Send in duplicate to:
FRED W. MATTHEWS
SUPERVISOR-PROJECTS SECTION
DEPARTMENT OF MINES &
NORTHERN AFFAIRS
WHITNEY BLOCK
QUEEN'S PARK
TORONTO, ONTARIO

Performance and coverage credits do not apply to airborne surveys

SUBMISSION OF GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL SURVEYS AS ASSESSMENT WORK

In order to simplify the filing of geological, geochemical and ground geophysical surveys for assessment work, the Minister has approved the following procedure under Section 84 (8a) of the Ontario Mining Act. This special provision does not apply to airborne geophysical surveys.

If, in the opinion of the Minister, a ground geophysical survey meets the requirements prescribed for such a survey, including:

(a) substantial and systematic coverage of each claim
(b) line spacing not exceeding 400 foot intervals
(c) stations not exceeding 100 foot intervals or
(d) the average number of readings per claim not less than 40 readings

it will qualify for a credit of 40 assessment work days for each claim so covered. It will not be necessary for the applicant to furnish any data or breakdown concerning the persons employed in the survey except for the names and addresses of those in charge of the various phases (linecutting contractor, etc.). It will be assumed that the required number of man days were spent in producing the survey to qualify for the specified credit.

Each additional ground geophysical survey using the same grid system and otherwise meeting these requirements will qualify for an assessment work credit of 20 days.

A geological survey using the same grid system, and meeting the requirements for submission of geological surveys for maximum credits will qualify for an assessment work credit of 20 days. If line cutting has not previously been reported with any other survey and is reported in conjunction with the geological survey a credit of 40 days per claim will be allowed for the survey.

Similarly, a geochemical survey using the same grid system with the average number of collected samples per claim being not less than 40 samples, and meeting the requirements for the submission of geochemical surveys for maximum credits, will qualify for an assessment work credit of 20 days. If line cutting has not previously been reported with any other survey and is reported in conjunction with the geochemical survey a credit of 40 days per claim will be allowed for the survey.

Credits for partial coverage or for surveys not meeting requirements for full credit will be granted on a pro-rata basis.

If the credits are reduced for any reason, a fifteen day Notice of Intent will be issued. During this period, the applicant may apply to the Mining Commissioner for relief if his claims are jeopardized for lack of work or, if he wishes, may file with the Department, normal assessment work breakdowns listing the names of the employees and the dates of work. The survey would then be re-assessed to determine if higher credits may be allowed under the provisions of subsections 8 and 9 of section 84 of the Mining Act.

If new breakdowns are not submitted, the Performance and Coverage credits are confirmed to the Mining Recorder at the end of the fifteen days.

PERFORMANCE & COVERAGE CREDITS

ASSESSMENT WORK DETAILS

Township or Area: Halliday

Type of Survey: Electromagnetic
A separate form is required for each type of survey

Chief Line Cutter or Contractor: P. Godin
Name
434 Main Street, Timmins, Ontario
Address

Party Chief: C. Campsall
Name
26 Pine St. S., Timmins, Ontario
Address

Consultant: R. J. Bradshaw
Name
26 Pine St. S., Timmins, Ontario
Address

COVERING DATES

Line Cutting: October 21 - November 8, 1970

Field: December 17 - December 24, 1970
Instrument work, geological mapping, sampling etc.

Office: December 24, 1970 - January 4, 1971

INSTRUMENT DATA

Make, Model and Type: Ronka EM-16

Scale Constant or Sensitivity: + or - 1 per cent
Or provide copy of instrument data from Manufacturer's brochure.

Radiometric Background Count: _____

Number of Stations Within Claim Group: 780

Number of Readings Within Claim Group: approx. 1047

Number of Miles of Line cut Within Claim Group: 15

Number of Samples Collected Within Claim Group: _____

CREDITS REQUESTED	20 DAYS per claim	40 DAYS per claim	Includes (Line cutting)
Geological Survey	☐	☐	
Geophysical Survey	☒	☐	Show Check ✓
Geochemical Survey	☐	☐	

DATE: May 17, 71

SIGNED: [signature]

MINING CLAIMS TRAVERSED
List numerically

255462
¼ not covered
255463
¾
255464
255467
¼
255468
¼
255472
¼
255474
255475
½
291997
291998

Areas of claims not covered
= 1 3/4

RECEIVED
MAY 18 1971
PROJECTS SECTION

10 x 20 = 200 ÷ (10+1)
= 18.18 days per claim

TOTAL: 10 claims

space insufficient, attach list

Send in duplicate to:
FRED W. MATTHEWS
SUPERVISOR-PROJECTS SECTION
DEPARTMENT OF MINES &
NORTHERN AFFAIRS
WHITNEY BLOCK
QUEEN'S PARK
TORONTO, ONTARIO

Performance and coverage credits do not apply to airborne surveys

SUBMISSION OF GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL SURVEYS

AS ASSESSMENT WORK

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If, in the opinion of the Minister, a ground geophysical survey meets the requirements prescribed for such a survey, including:

(a) substantial and systematic coverage of each claim
(b) line spacing not exceeding 400 foot intervals
(c) stations not exceeding 100 foot intervals or
(d) the average number of readings per claim not less than 40 readings

it will qualify for a credit of 40 assessment work days for each claim so covered. It will not be necessary for the applicant to furnish any data or breakdown concerning the persons employed in the survey except for the names and addresses of those in charge of the various phases (linecutting contractor, etc.). It will be assumed that the required number of man days were spent in producing the survey to qualify for the specified credit.

Each additional ground geophysical survey using the same grid system and otherwise meeting these requirements will qualify for an assessment work credit of 20 days.

A geological survey using the same grid system, and meeting the requirements for submission of geological surveys for maximum credits will qualify for an assessment work credit of 20 days. If line cutting has not previously been reported with any other survey and is reported in conjunction with the geological survey a credit of 40 days per claim will be allowed for the survey.

Similarly, a geochemical survey using the same grid system with the average number of collected samples per claim being not less than 40 samples, and meeting the requirements for the submission of geochemical surveys for maximum credits, will qualify for an assessment work credit of 20 days. If line cutting has not previously been reported with any other survey and is reported in conjunction with the geochemical survey a credit of 40 days per claim will be allowed for the survey.

Credits for partial coverage or for surveys not meeting requirements for full credit will be granted on a pro-rata basis.

If the credits are reduced for any reason, a fifteen day Notice of Intent will be issued. During this period, the applicant may apply to the Mining Commissioner for relief if his claims are jeopardized for lack of work or, if he wishes, may file with the Department, normal assessment work breakdowns listing the names of the employees and the dates of work. The survey would then be re-assessed to determine if higher credits may be allowed under the provisions of subsections 8 and 9 of section 84 of the Mining Act.

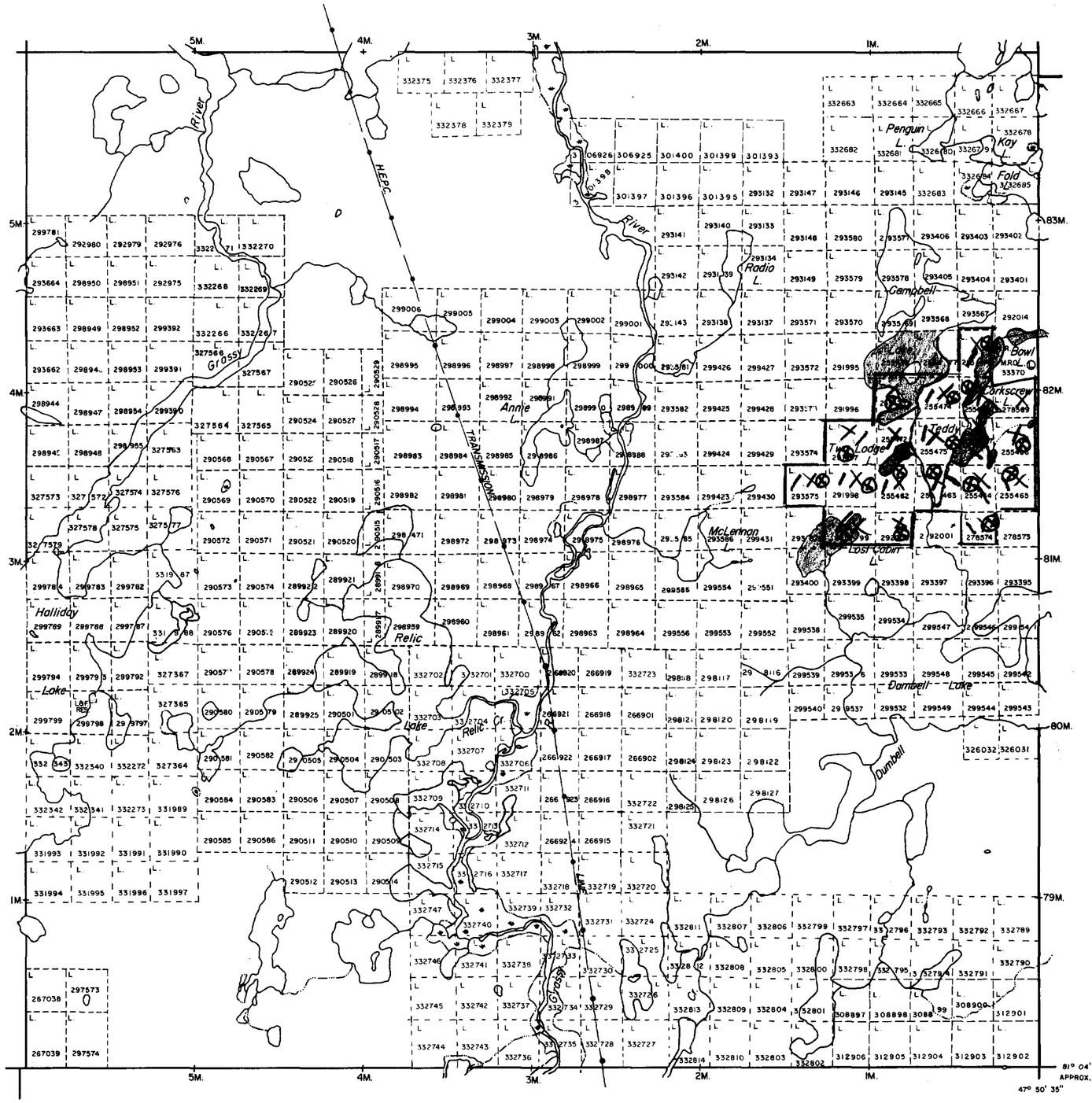
If new breakdowns are not submitted, the Performance and Coverage credits are confirmed to the Mining Recorder at the end of the fifteen days.

SHIELD GEOPHYSICS LIMITED
26 Prue St. S,
Dominion, Ontario.

ONTAR

Mr. Fred Matthews,
Supervisor, Projects Section,
Department of Mines and
Northern Affairs,
Whitney Block,
Queen's Park,
TORONTO 182, Ontario.

HUTT Twp. M-943



SOTHMAN Twp. M-1121

MIDLOTHIAN Twp. M-235

MOND Twp. M-870

200

NOTES

400' surface rights reservation along the shores of all lakes and rivers.

X E Mt Mary

1 = Geological

⊗ Geochemical

DATE OF ISSUE

NOV 25 1971

ONT. DEPT. OF MINES AND NORTHERN AFFAIRS

LEGEND

PATENTED LAND	Ⓟ or ●
PATENTED FOR SURFACE RIGHTS ONLY	◒
LEASE	Ⓛ
LICENSE OF OCCUPATION	L.O.
CROWN LAND SALES	C.S.
LOCATED LAND	Loc.
CANCELLED	C.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O.
HIGHWAY & ROUTE NO.	(17)
ROADS	
TRAILS	
RAILWAYS	
POWER LINES	
MARSH OR MUSKEG	
MINES	

*used only with summer resort locations or when space is limited

TOWNSHIP OF

Claim HALLIDAY Map

DISTRICT OF SUDBURY

file 2.399

LARDER LAKE MINING DIVISION

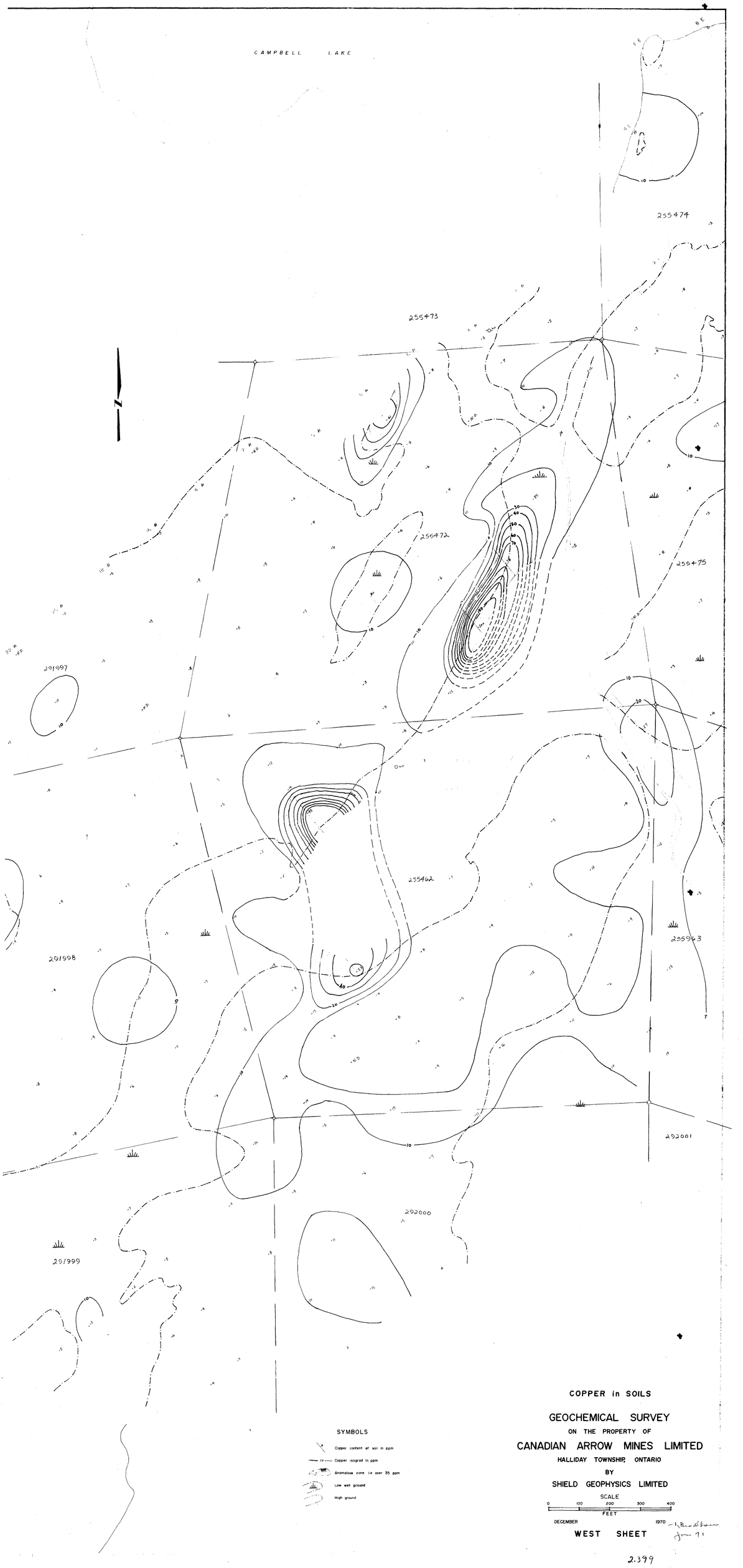
SCALE : 1 INCH = 40 CHAINS (1/2 MILE)

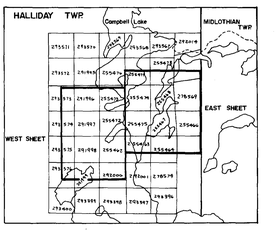
DR. R.W.N

DATE FEB. 2, 71.

PLAN NO. M-910

ONTARIO
DEPARTMENT OF MINES
AND NORTHERN AFFAIRS


CAMPBELL LAKE
255474
255473
255472
255475
291997
255462
255963
291998
292001
292000
291999
N
SYMBOLS
Copper content of soil in ppm
Copper isograd in ppm
Anomalous zone i.e. over 35 ppm
Low wet ground
High ground
COPPER in SOILS
GEOCHEMICAL SURVEY
ON THE PROPERTY OF
CANADIAN ARROW MINES LIMITED
HALLIDAY TOWNSHIP, ONTARIO
BY
SHIELD GEOPHYSICS LIMITED
SCALE
0 100 200 300 400
FEET
DECEMBER 1970
WEST SHEET
2.399



KEY PLAN

one inch to one half mile

CORKSCREW LAKE

TEDDY LAKE

255468

278569

255467

255466

255464

278574

SYMBOLS

Copper content of soil in ppm

Copper isograd in ppm

Anomalous zone i.e. over 35 ppm

Low wet ground

High ground

COPPER in SOILS

GEOCHEMICAL SURVEY

ON THE PROPERTY OF

CANADIAN ARROW MINES LIMITED

HALLIDAY TOWNSHIP, ONTARIO

BY

SHIELD GEOPHYSICS LIMITED

SCALE

0 100 200 300 400

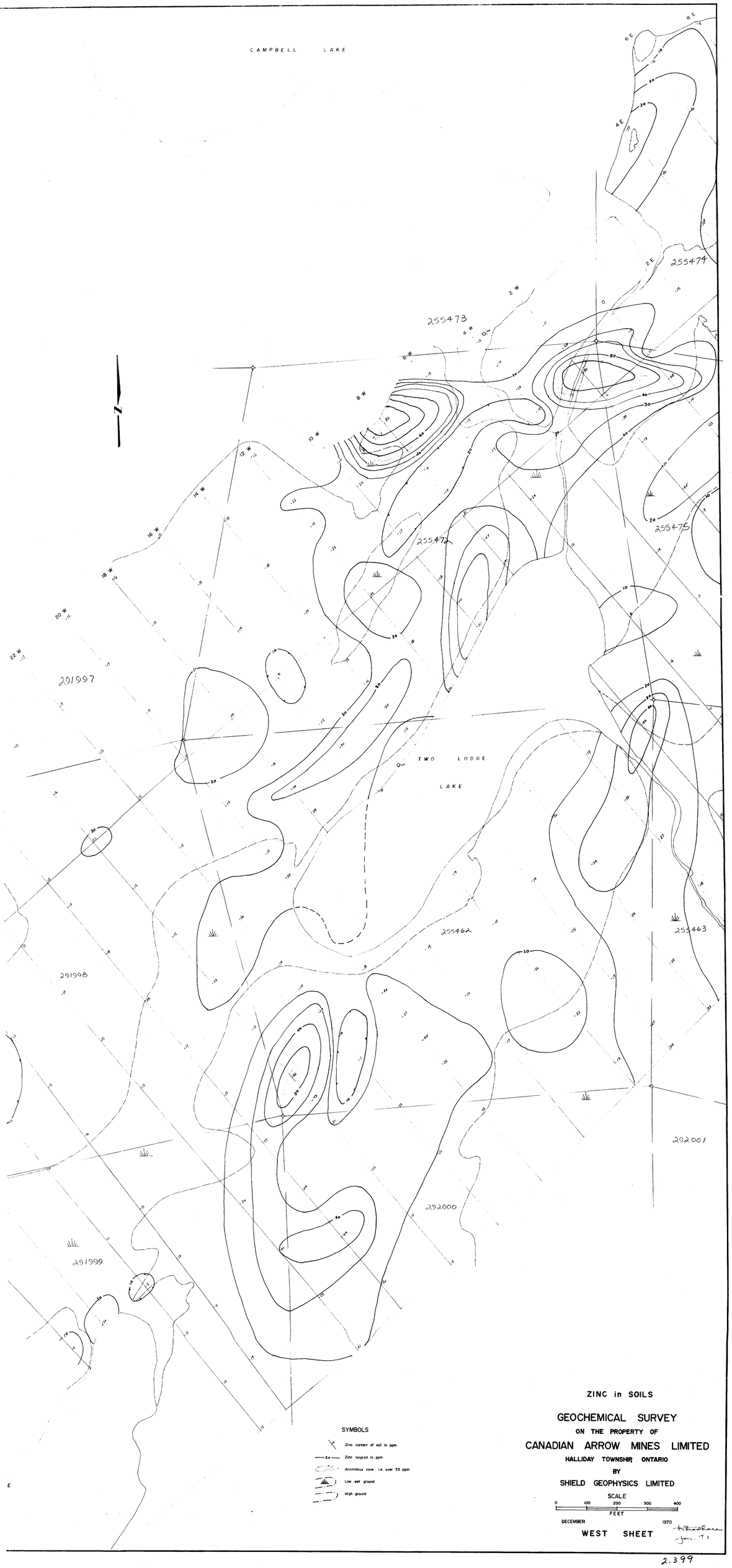
FEET

DECEMBER 1970

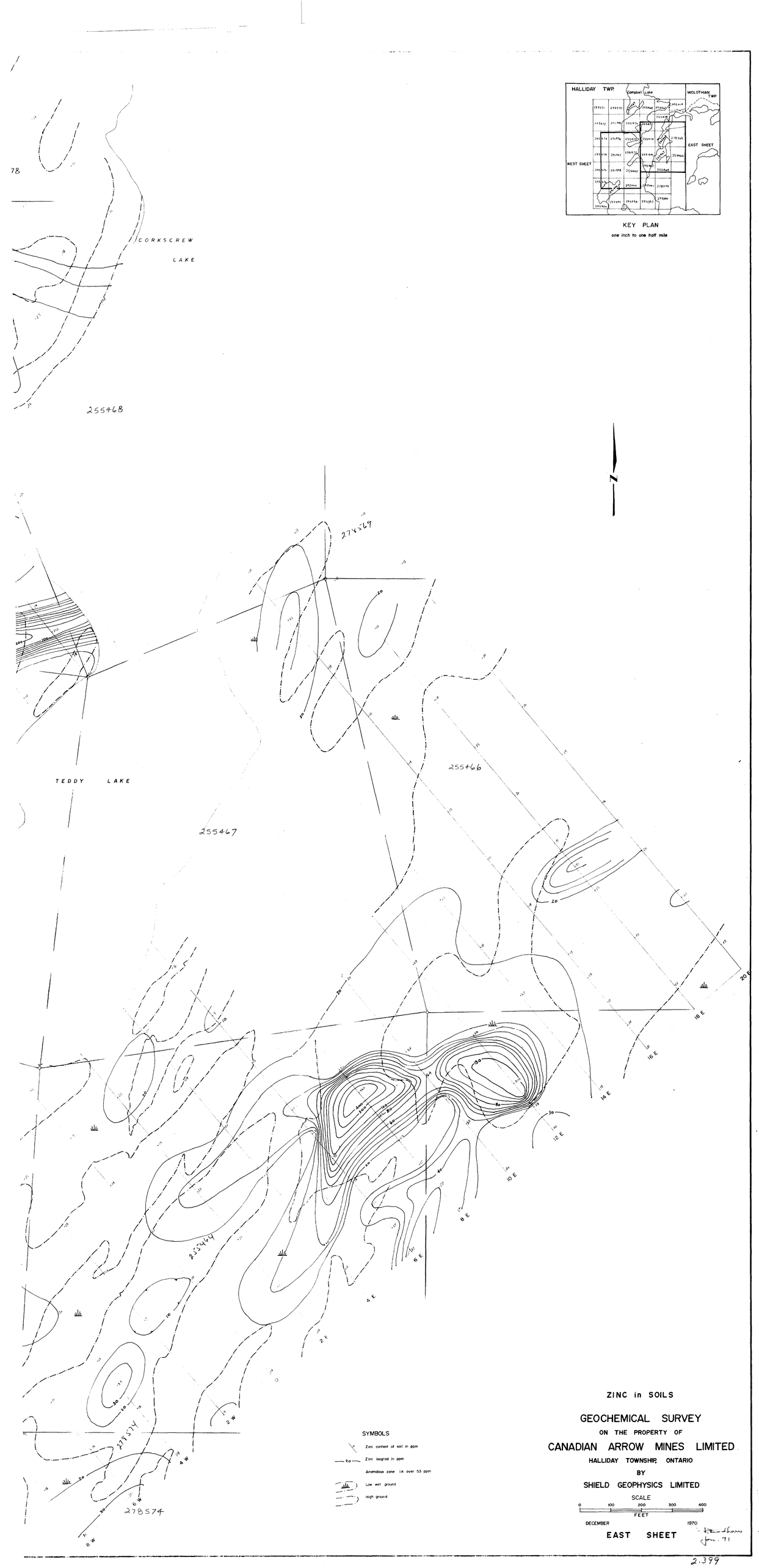
EAST SHEET

Jan. 71

2399


CAMPBELL LAKE
TWO LODGE LAKE
255479
255473
255474
255475
255462
255463
291997
291998
291999
292000
292001
N
SYMBOLS
Zinc content of soil in ppm
Zinc isograd in ppm
Anomalous zone i.e. over 55 ppm
Low wet ground
High ground
ZINC in SOILS
GEOCHEMICAL SURVEY
ON THE PROPERTY OF
CANADIAN ARROW MINES LIMITED
HALLIDAY TOWNSHIP, ONTARIO
BY
SHIELD GEOPHYSICS LIMITED
SCALE
0 100 200 300 400
FEET
DECEMBER 1970
WEST SHEET

2.399


HALLIDAY TWP.
Campbell Lake
MIDLOTHIAN TWP.
WEST SHEET
EAST SHEET
KEY PLAN
one inch to one half mile
CORKSCREW LAKE
TEDDY LAKE
255468
255467
255466
255544
278574
278569
N
SYMBOLS
Zinc content of soil in ppm
Zinc isograd in ppm
Anomalous zone i.e. over 53 ppm
Low wet ground
High ground
ZINC in SOILS
GEOCHEMICAL SURVEY
ON THE PROPERTY OF
CANADIAN ARROW MINES LIMITED
HALLIDAY TOWNSHIP, ONTARIO
BY
SHIELD GEOPHYSICS LIMITED
SCALE
0 100 200 300 400
FEET
DECEMBER 1970
EAST SHEET

2.399

LEGEND.

- Measurement station along picket line
- 280 — Relative value of the vertical component of the earth's magnetic field in gammas
- Magnetic contour
- Magnetic depression

INSTRUMENT: Sharpe M.F. - 1 fluxgate magnetometer

291997

255472

255464

N

MAGNETOMETER SURVEY

ON THE PROPERTY OF

CANADIAN ARROW MINES LIMITED

HALLIDAY TOWNSHIP, ONTARIO

BY

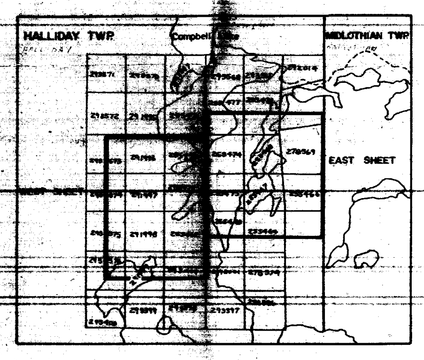
SHIELD GEOPHYSICS LIMITED

SCALE

0 200 400 600 800

FEET

JANUARY 1971



KEY MAP

one inch to one half mile

LEGEND

Measurement station along picket line

In phase readings (%) plotted to right

Quadrature readings (%) plotted to left

Profile scale: 1" = 40%

In phase profile

Quadrature profile

Conductor

INSTRUMENT: Ronka EM 16
Tx. Stn. - Seattle, Washington

ELECTROMAGNETIC SURVEY

ON THE PROPERTY OF

CANADIAN ARROW MINES LIMITED

HALLIDAY TOWNSHIP, ONTARIO

BY

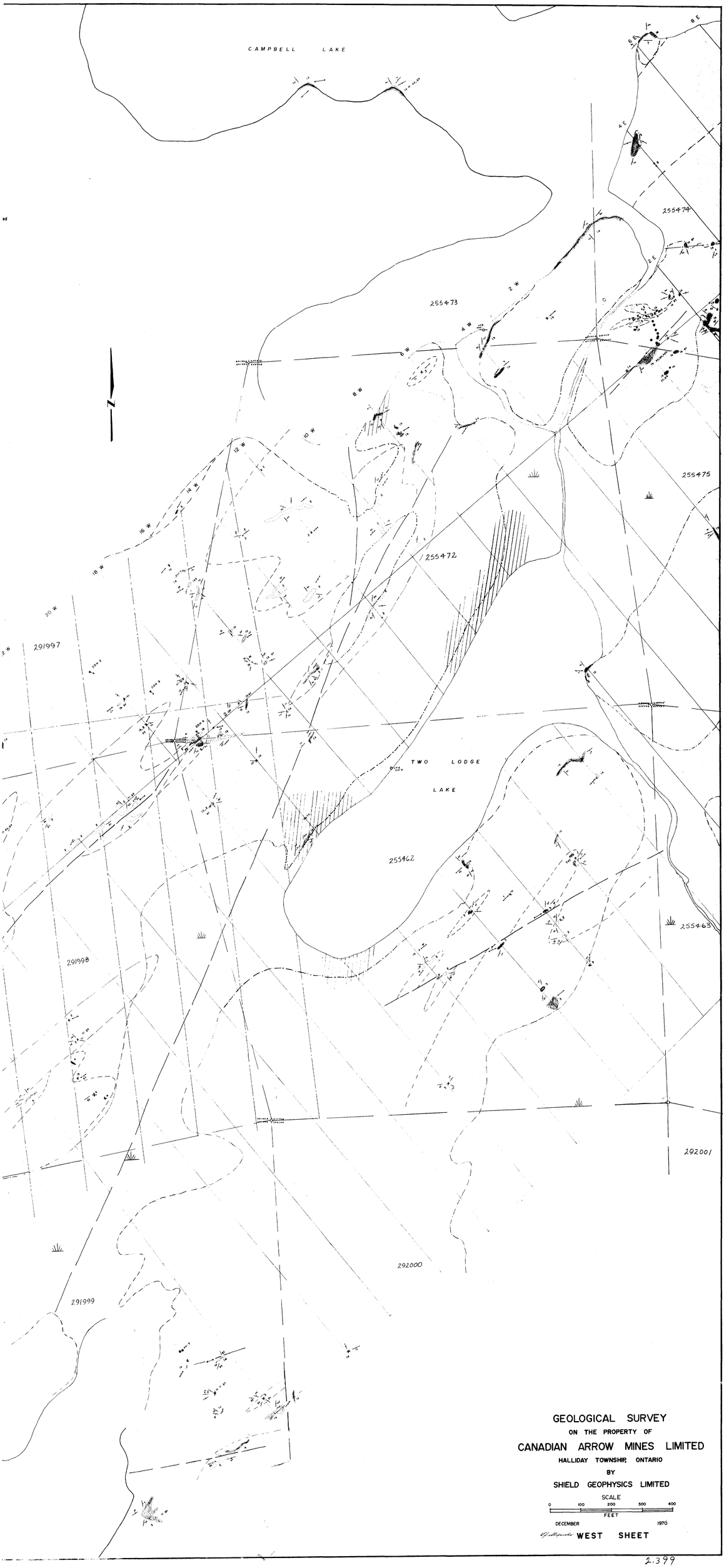
SHIELD GEOPHYSICS LIMITED

SCALE

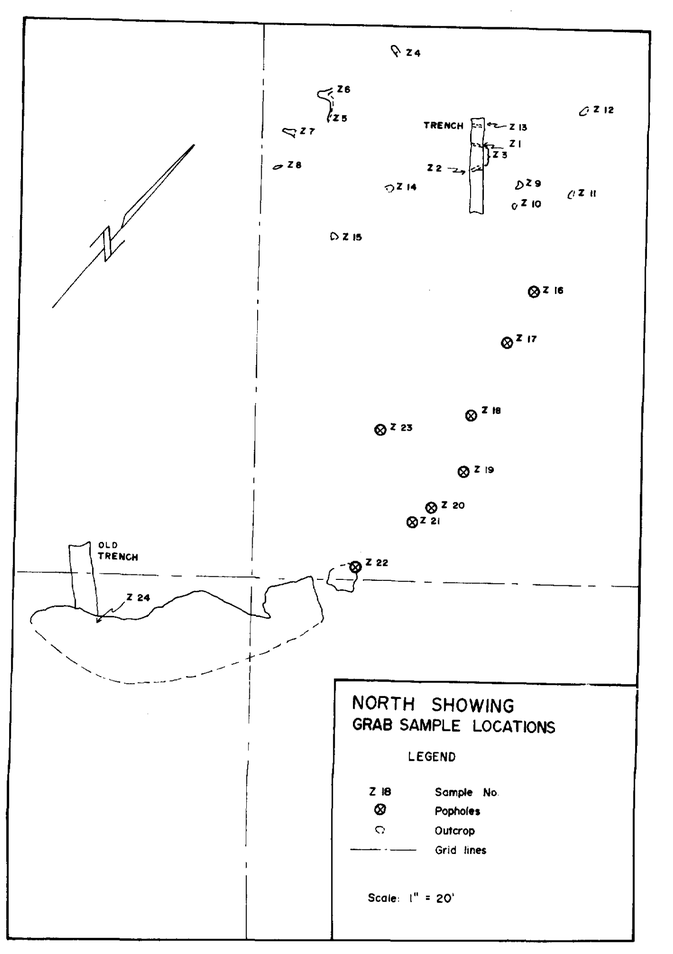
0 200 400 600 800

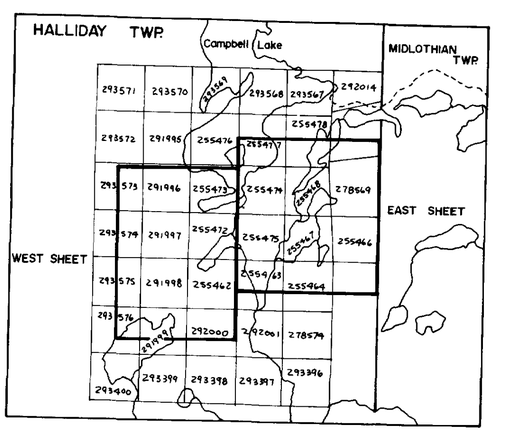
FEET

JANUARY 1971


CAMPBELL LAKE
TWO LODGE LAKE
255474
255473
255475
255472
255462
255463
291997
291998
291999
292000
292001
N
GEOLOGICAL SURVEY
ON THE PROPERTY OF
CANADIAN ARROW MINES LIMITED
HALLIDAY TOWNSHIP, ONTARIO
BY
SHIELD GEOPHYSICS LIMITED
SCALE
0 100 200 300 400
FEET
DECEMBER 1970
WEST SHEET

2.399





KEY PLAN
one inch to one half mile

CORKSCREW LAKE

TEDDY LAKE

255468

278569

255466

255467

255464

SOUTH SHOWING

20E 18E 16E 14E 12E 10E 8E 6E 4E 2E 0 2W 4W 6W 8W

See West Sheet for Geology Legend & Symbols

GEOLOGICAL SURVEY

ON THE PROPERTY OF

CANADIAN ARROW MINES LIMITED

HALLIDAY TOWNSHIP, ONTARIO

BY

SHIELD GEOPHYSICS LIMITED

SCALE

0 100 200 300 400

FEET

DECEMBER 1970

EAST SHEET

2.379

41P14NE0099 2.399 HALLIDAY

220

LOST CABIN LAKE

SYMBOLS

Zinc content of soil in ppm

Zinc isograd in ppm

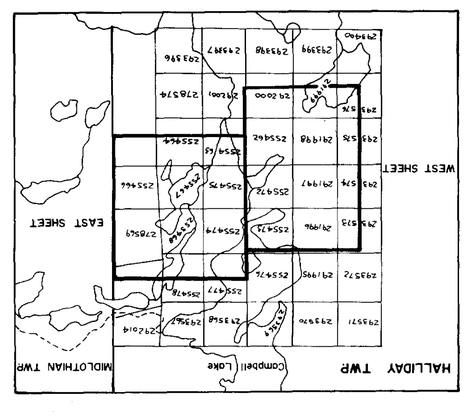
Anomalous zone i.e. over 53 ppm

Low wet ground

High ground

KEY PLAN

one inch to one half mile



TWO LODGE LAKE

CAMPBELL LAKE

SYMBOLS

Zinc content of soil in ppm

Zinc isograd in ppm

Anomalous zone i.e. over 53 ppm

Low wet ground

High ground

TEDDY LAKE

CORKSCREW LAKE

LOST CABIN LAKE

291999

292000

291998

291997

255472

255473

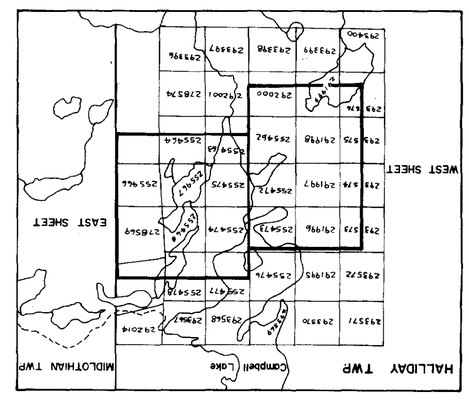
255462

TWO LODGE LAKE

CAMPBELL LAKE

KEY PLAN

one inch to one half mile



LEGEND

RHYOLITE

1 a Light olive to turquoise green, occasionally light grey, massive to schistose, microgranular texture, homogeneous occasionally brecciated with quartz filling

1 b Light to medium olive green, frequently pink to red staining, very fine to medium grained, often quartzitic in the form of veining and cherty inclusions

1 c Medium olive to flesh red, coarsely granular, frequently inhomogeneous agglomerate

RHYODACITE

Medium blue-green to dirty grey-green colour, variable grain size and frequently very inhomogeneous, massive to schistose

DACITE

Medium to dark blue-green colour, very fine grained, equigranular to cmygdular with rusty red to orange dolomite cmygdules, cmygdular variety exhibits flow banding, massive to moderately schistose

ANDESITE

Dark green to dirty grey-black, generally very fine grained, moderately cmygdular to equigranular

DIORITE

Very dark grey to black medium to fine grained crystalline, frequent small quartz phenocrysts

SYMBOLS

py	pyrite
gn	galena
sph	sphalerite
qtz	quartzite
gv	quartz vein
sh	shear
ft	fracture
	schistosity
x	outcrop
	fault, observed and interpreted
⊕ Y-1,PH-1	pophole and sample number
J-35678	claim post and number
	Geologic boundaries
	interpreted and assumed
	Old grid lines
DDH-3	Diamond drill hole
	Low wet ground
	High ground
	Zinc anomaly
	Copper anomaly

See West Sheet for Geology Legend & Symbols