



A REPORT ON THE PRICE TOWNSHIP PROPERTY
OF ARGENTEX RESOURCE EXPLORATION CORPORATION,
DISTRICT OF COCHRANE, ONTARIO

November 10, 1981

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SUMMARY

Argentex Resource Exploration Corporation holds a group of 45 unpatented mining claims in the southern part of Price Township, and the northern portion of Fripp Township, District of Cochrane, Ontario. The property is accessible by road, lying approximately 15 miles south of the City of Timmins, Ontario.

The property was acquired by staking during 1981, prompted by the discovery of substantial lead-zinc-silver mineralization in the area by Mr. H. Hanson. The mineralized zone, exposed in one trench, consists of fracture-controlled sulphides in folded magnetic iron formation over a width of approximately 25 feet. The length of the zone is unknown. This is the first reported occurrence of this type of sulphide concentration in the area.

Pyrite, galena, amber sphalerite and some chalcopyrite occur in this relatively small exposure, estimated to grade overall at 3 to 5 percent Zn, and about 1 percent Pb and 0.2 oz.Ag/ton. Some chip sampling and representative sampling has been done by Argentex on the mineralized zone, but the results are considered inconclusive. Bulk sampling of the zone will be required for reliable grade determination.

An extensive grid has been cut over the west portion of the property, and magnetic and VLF-EM surveying completed at 400 foot line spacing. Coincident magnetic and conductive anomalies exist in the prospect locale, and at least eight similar targets have been defined within the surveyed area. No exploratory work has yet been completed in the East property area, but a geological environment similar to that in the West property area is believed present.

Magnetic survey data suggest that a large, north-plunging anticline underlies the West property area. Subsidiary folding within the iron formation units present is very strongly developed, and this feature may well exert some control on the distribution of valuable sulphide mineralization.

The property warrants careful and thorough exploration, and to this end a staged exploration program has been developed and recommended for implementation.

The first stage will provide for further prospect evaluation, preliminary evaluation of other targets defined within the present grid area, and initial exploration of the East property area. The cost of this work is estimated at \$ 136,840.

The second stage of the recommended program will consist largely of drilling, and it is estimated that approximately \$ 423,500 in further financing will be required. The extent and direction of this latter stage will, of course, be contingent on the results of prior work.

INTRODUCTION

This report on the Price Township property of Argentex Resource Exploration Corporation (Argentex) has been prepared by G.M. Hogg, P.Eng., at the request of Mr. R.J. Kasner, president of that Company. The Price Township property, located approximately fifteen miles south of Timmins, Ontario, was acquired by Argentex during 1981, following their discovery of lead-zinc-silver mineralization in the area.

The purpose of this report is to provide an independent assessment of the economic potential of the property, based on a review of all available data. Also, as deemed appropriate, a program of exploration and evaluation will be recommended to further test the property.

The writer is familiar with the area, having performed exploration and evaluation work in the region in the past. The property was visited by the writer relevant to this study on August 26, 1981.

Information on the geological character of the Price Township area is not extensive, although prospecting and limited exploration operations have been carried on sporadically in the general area since the early 1900's. Such data as is available in the files and publications of the Ontario Ministry of Natural Resources has been utilized in this study, as well as that provided by Argentex. During 1981, this Company completed VLF-EM and magnetic surveying over a portion of the property, and has performed trenching and sampling in the main prospect location.

The work completed by Argentex personnel is considered adequate in all respects, and their cooperation in the supply of data and discussion of results is gratefully acknowledged.

PROPERTY LOCATION, ACCESS

The Price Township property of Argentex lies in the south-central part

of Price Township, extending a short distance into Fripp Township to the south. It is located approximately 15 miles south of the City of Timmins, within the District of Cochrane of the Province of Ontario (see Figure 1).

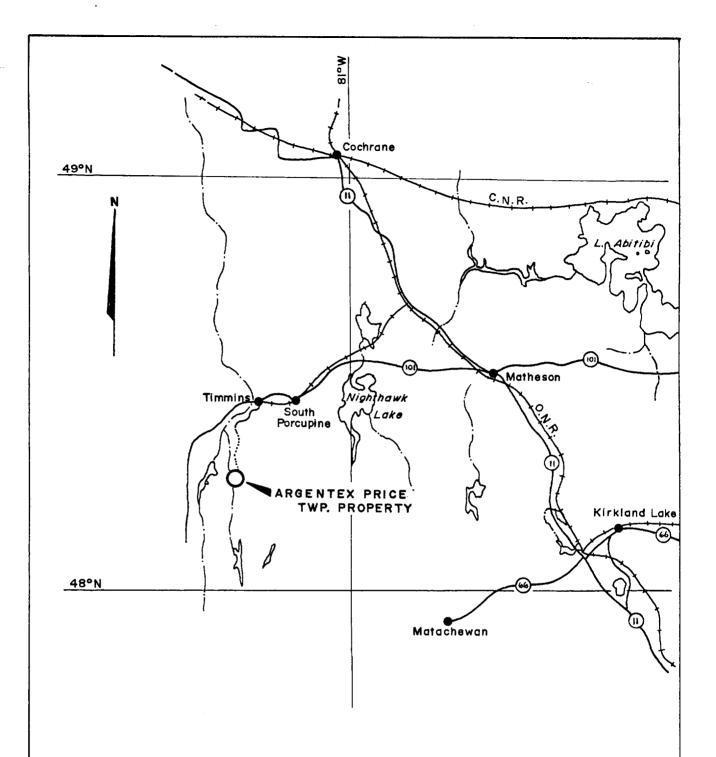
The property is accessible via bush road extending approximately six miles south from the gravel road between Timmins and Wawaitin Falls. This unimproved bush road runs along the east side of the Grassy River, and is suitable for the passage of four-wheel drive vehicles. It is not maintained during winter months.

The area is well-wooded, and of moderate to low relief. The east bank of the Grassy River, which extends through the western extremity of the property, is marked by a sharp rise of up to 100 feet. Thick glacial sand deposits exist in the general area, but are locallized mainly to the north of the Argentex property. With the exception of the areas to the north of Latimer and Katoshaskepeko Lakes within the property, overburden is of shallow to moderate depth, and there is reasonably good exposure of bedrock.

An Ontario Hydro power line crosses the northern part of Price Township, and infrastructure suitable to mining operations exists in Timmins, a few miles to the north. Adequate supplies of water and timber for mining operations are available in the property vicinity.

LAND TENURE, OWNERSHIP

The main Argentex property area consists of 31 unpatented and unsurveyed mining claims lying in the south-central part of Price Township, and the northern part of Fripp Township. Also acquired by staking, but as yet unexplored, is another contiguous group of 14 mining claims lying to the east of the main group. The total holdings of Argentex in this area are thus 45 mining claims, comprising an area of approximately 1780 acres. A location sketch of these claims is shown in Figure 2.



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LOCATION PLAN OF THE PRICE TWP. PROPERTY
OF ARGENTEX RESOURCE EXPLORATION CORP.,
DISTRICT OF COCHRANE, ONTARIO

SCALE: I" = 16 ml.

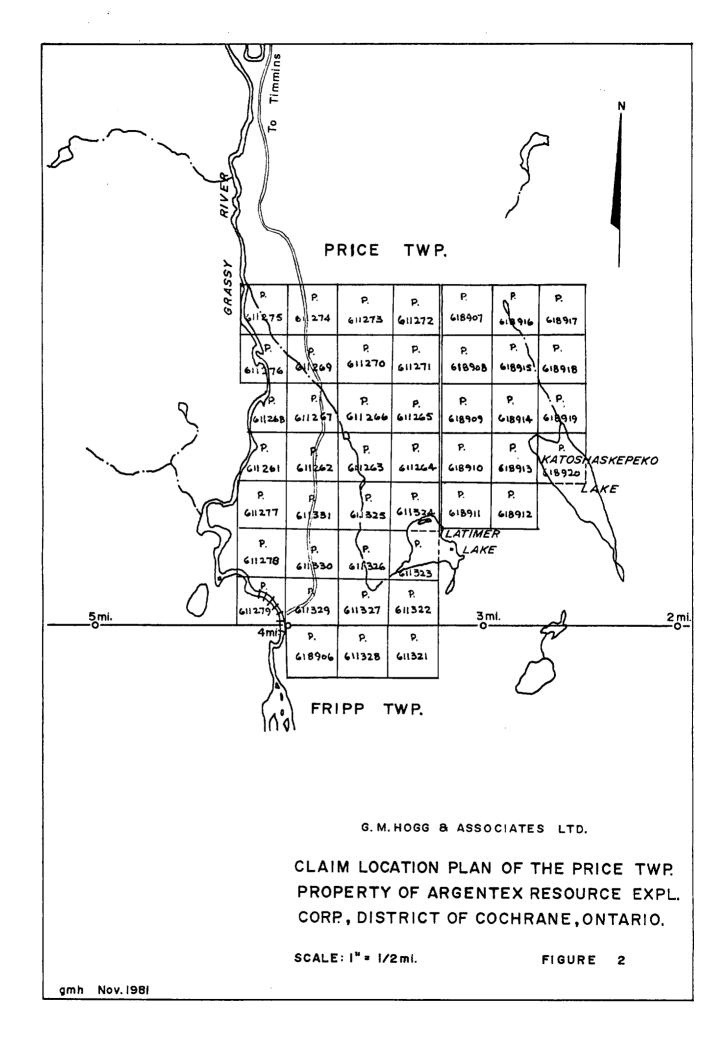
FIGURE I

gmh Nov. 1981

Staking was performed during July and August, 1981, and the claims are presently registered in the name of Argentex Resource Exploration Corporation. They may be listed as follows:

Claim No.	Township	Group*
P.611321	Fripp	Main or West
P.611322	Price	tt
P.611323	\$1	11
P.611324	II	11
P.611325	n	11
P.611326	II .	11
P.611327	II	lt .
P.611328	Fripp	ti
P.611329	Price	u
P.611330	11	11
P.611331	II .	11
P.611261	Price	Main or West
P.611262	ti	11
P.611263	11	II .
P.611264	II	II .
P.611265	II	II .
P.611266	u	11
P.611267	ti .	11
P.611268	II	11
P.611269	II	tt
P.611270	II	H
P.611271	11	11
P.611272	II	11
P.611273	"	H
P.611274	II .	#1
P.611275	11	11
P.611276	II	II .
P.611277	11	11
P.611278	11	II
P.611279	n	11
P.618906	Fripp	Main or West
P.618907	Price	East
P.618908	II	II .
P.618909	ш	Ħ
P.618910	II	11
P.618911	11	11
P.618912	11	n
P.618913	u	ti

Cont.



Claim Listing Cont.

Claim No.	Township	Group*
D (10014		
P.618914	Price	East
P.618915	11	11
P.618916	11	H .
P.618917	11	II
P.618918	11	11
P.618919	II .	11
P.618920	II .	11

* The claims of the "Main" or West Group have been surveyed geophysically, and some trenching has been completed on them. The claims of the East Group have had no work completed on them to date.

Ownership of the claims constituting the Argentex Price property is warranted secure, and as represented. Subject to the approval of the responsible regulatory authorities, the claims of the West Group appear to have sufficient assessment work creditable for continued tenure through the 1982-83 claim year.

HISTORY OF PROPERTY

Prospecting activities in the Price Township area ensued in the early 1900's after the discovery of gold in the Porcupine Camp. This early work was, of course, gold-oriented, and unsuccessful. Pyritic zones within iron formation were noted, however, and some pitting was done within the present Argentex Price property area.

During the 1960's the central part of the Argentex Price property was held by O'Leary Malartic Mines Ltd. This company was attracted to the area by values in copper reported in the pyritic zones pitted and trenched by the earlier workers. Self potential and some electromagnetic surveying were done in the area by this company, but the results were inconclusive, and no drilling was undertaken as far as is known.

About the same period, a single packsack drill hole was drilled in the general area (location uncertain), and O.D.M. records show an assay

return of 4 percent copper and 21 oz.Au/ton from this hole. It may be that this report prompted the interest of O"Leary Malartic Mines Ltd. in the area. There is, in any case, no record of subsequent work on this prospect, and no corroboration of this spectacular result.

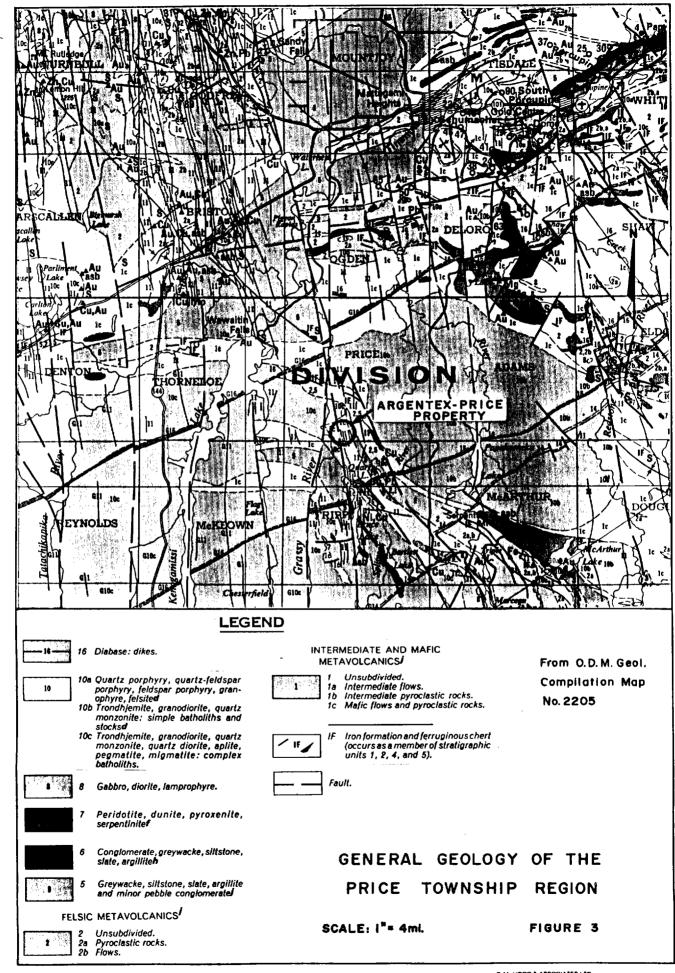
During 1981, Mr. Harris Hanson of Kenogami, Ontario, prospected in the area, and located some angular float containing pyrite, sphalerite and galena in what is now the south-central part of the Argentex claim area. This material yielded an assay value of 6.59 percent Zn, 1.26 percent Pb, and 0.27 oz.Ag/ton. Subsequent prospecting and trenching by Mr. Hanson and Mr. G.C. Kasner of Argentex located an occurrence of mineralized iron formation, which may be the source of the original float. The claim group as presently described was then acquired on behalf of Argentex, and geophysical surveying was completed over the western part of the property. Sampling of the newly discovered prospect was also undertaken.

To date, with the recognition of the potential economic importance of the iron formation as a host to base metal mineralization in this area, several hundred claims have been staked by other interests through Price and Fripp Townships. It is expected that exploration activity will be of a substantial level in this area during the coming year.

GENERAL GEOLOGY

As shown in Figure 3, the Price Township area is underlain wholly by Archean rocks, lying to the south of the Porcupine-Destor fault system. The Argentex Price property itself is situated on a metavolcanic/metased-iment belt which extends in a northwesterly direction through McArthur, Fripp, Price and Thorneloe Townships. Granitic rocks in batholithic proportions occur to the northeast and southwest of this belt.

Within the belt the metasedimentary sequence includes iron formation, graywacke, and some slatey rocks. Volcanic units include andesitic and felsic rock, both as flows and fragmentals. Basic to ultrabasic rocks,



diabase and granite exist as smaller intrusive masses within the metasediments and metavolcanics.

Faulting of a northern orientation is interpreted to exist in the area. Notably this includes a system paralleling the Grassy River, and another through Katoshaskepeko Lake, both passing through the Argentex Price property. Ultrabasic material, probably in sill-like form, occurs associated with the latter fault system at the south end of Katoshaskepeko Lake.

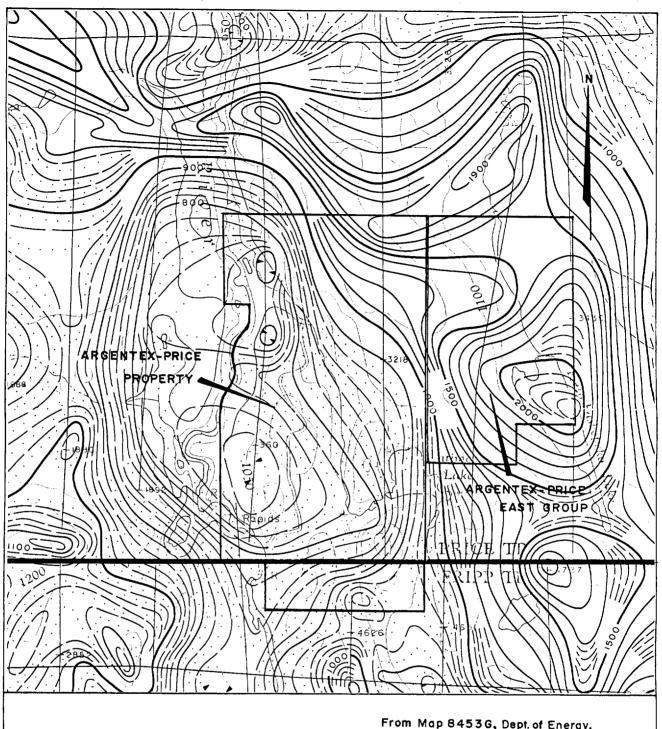
The aeromagnetic plan of the property area (see Figure 4) suggests the extreme western part of the Argentex Price property to be underlain by an elliptical granite mass. The metasediment/metavolcanic complex, including iron formation, extends northward from Fripp Township, swinging to a westerly strike north of the property. A magnetic low, extending east from the postulated granite mass across the northern part of the property, has been interpreted as reflecting a nose-like invasion of granite into the metasediment/metavolcanic complex.

The most recent published geological map of the Price Township area is O.D.M. Preliminary Map P.941 (1974). Data therein has been largely taken from the earlier O.D.M. Preliminary Map of Price Township, P.30 (1957).

ECONOMIC GEOLOGY

GENERAL CONSIDERATIONS:

Within the metasediment/metavolcanic belt in Fripp Township copper-nickel sulphide mineralization has been reported, associated with ultrabasic intrusive material (see Figure 3; Bruce and Quartz Lake areas). Some copper sulphide mineralization associated with pyrite and quartz has also been reported in siliceous rocks south of Katoshaskepeko Lake. This may be the area from which the high gold assay previously referred to originated. Except for this unsubstantiated occurrence, gold is not known to



From Map 8453G, Dept. of Energy, Mines & Resources, Ottawa, 1970

ISOMAGNETIC LINES	(total field)
500 gammas	~
10 gammas	
Flight lines	,

AEROMAGNETIC PLAN OF THE PRICE TOWNSHIP PROPERTY AREA

SCALE: |"= |/2 ml.

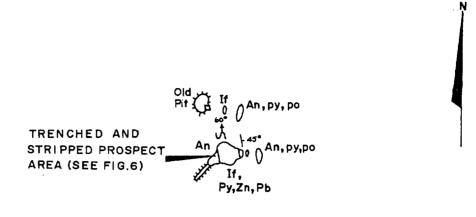
FIGURE 4

occur in significant concentrations in the general area.

The iron formation is magnetite-rich, but also contains considerable pyrite. This pyritic mineralization appears associated with amphibolitic bands within the iron formation, probably representing a tuffaceous, sulphide-rich facies of the iron formation. Pyrite does, however, occur within the oxide facies of the iron formation as bands, disseminations and along fracture planes. Nowhere in the area does the iron formation appear sufficiently concentrated to be of potential importance as a source if iron ore.

The geology of the west property area is shown in Map No. 1 (in pocket), outcrop locations having been taken from O.D.M. preliminary Map P.30. The lead-zinc prospect located by Messrs. Hanson and Kasner is shown thereon at 17+00N, 6+25E on the Argentex Grid. Previous workers in the area sank two pits, or shallow shafts, in this same vicinity, undoubtedly to explore discrete zones of heavy pyrite mineralization detected in prospecting. The presence of galena and sphalerite mineralization was not mentioned by earlier workers, but there is reference to the occurrence of some chalcopyrite.

The Argentex lead-zinc prospect, which will be described in more detail in the following sections, is well-exposed in the trenched and stripped area shown in Map No. 1. It consists of a twenty-five foot thickness of siliceous magnetite-iron formation which is strongly folded and fractured. The iron formation contains widely disseminated pyrite, galena, amber sphalerite, and traces of chalcopyrite. Pyrite is found particularly heavily concentrated in amphibolitic bands within the iron formation. Minor quartz veining and syenitic diklets are present in the mineralized zone, but are of limited distribution. It is noteworthy that the Argentex prospect is the first substantial lead-zinc occurrence reported in the Price-Fripp area.



Float An, py, Zn

4E

5E

6E

7E

8E

9 E

An, py, po

Low Ground

Old Pit (If, An, py on dump) LINE 12N 4E 5 E 6E 8 E 9 E 4 An, Gwke LEGEND - Int. Volc., amphibolitic - Iron Formation G.M. HOGG & ASSOCIATES LTD. - Dissem. Pyrite GEOLOGICAL SKETCH OF THE - Dissem. Pyrrhotite ARGENTEX-PRICE PROSPECT AREA - Dissem. Sphalerite APPROX. SCALE: | "= 100" FIGURE 5 - Dissem. Galena

gmh Nov. 1981

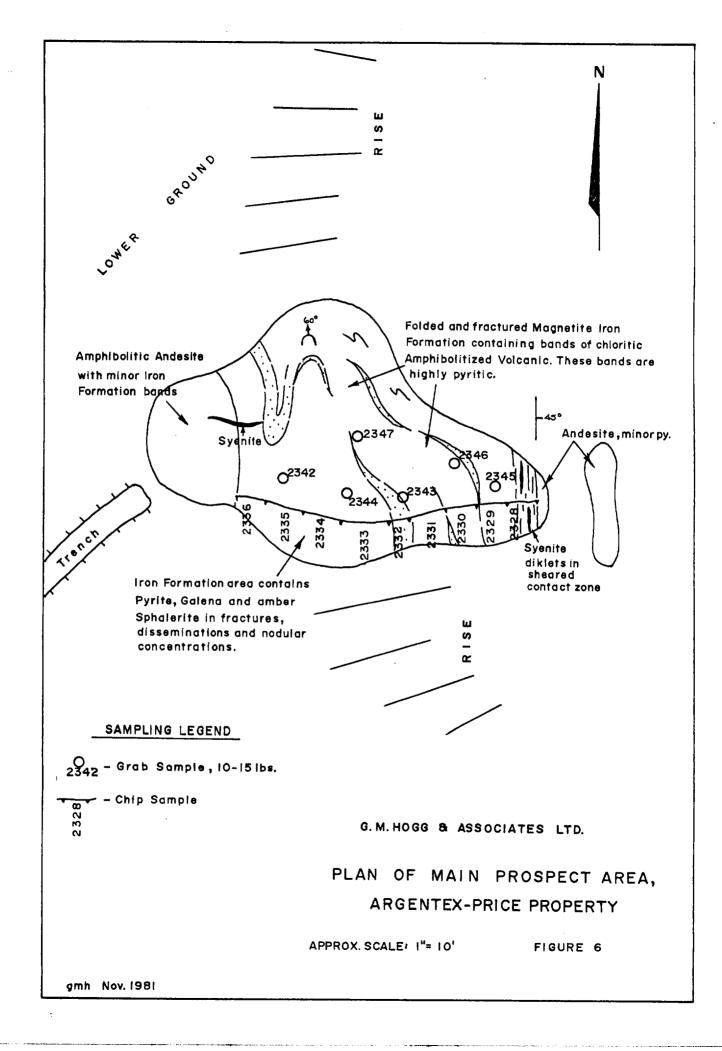
DESCRIPTION OF PROSPECT:

The general prospect area is shown in Figure 5, and the detail of the trenched and stripped area in Figure 6. As noted, the mineralized iron formation is strongly folded and fractured, extending across a twenty-five foot width. Amphibolitic andesite forms the footwall and hanging wall of the mineralized zone. The iron formation dips approximately 45°E as observed at the upper contact, and folding within it exhibits a 60°N plunge. The distribution of amphibolitic bands containing heavy disseminations of pyrite (up to 30%) within the iron formation is indicated schematically in Figure 6. These bands are chloritized in part.

The sulphide mineralization, consisting of pyrite, galena, amber sphalerite and traces of chalcopyrite, occurs in fractures, disseminations, and occasionally as nodular concentrations (ZnS) within the iron formation. It appears essentially fracture-controlled, but the nodular concentrations suggest the sulphides may be of syngenetic origin. In this eventuality, the association of mineralization with fracturing probably represents very local redistribution of sulphides under moderate dynamic and thermal metamorphic conditions. Alteration effects, such as chloritization and silicification, are not strongly developed.

The sulphides are variable in grain size and concentration density within the exposed zone. Under this condition the presence of the relatively light-colored sphalerite is often hard to detect. In any case, the erratic distribution of the mineralization presents a sampling problem which can best be overcome by the application of bulk sampling procedures.

It will be noted in Figure 5 that angular sulphide-bearing float has been located on Line 16+00N in the vicinity to 3+00E to 4+00E. This material may have originated from the defined prospect location, or from an as yet unknown source.



SAMPLING OF PROSPECT:

Spectrographic analysis of a higher grade sample from the mineralized zone has been completed by X-Ray Assay Laboratories Ltd., and is shown in Appendix II. It indicates the presence of iron, lead and zinc, with lesser silver, cobalt, copper, molybdenum, manganese and titanium. A grab sample of well-mineralized material from the prospect taken by the writer returned values of 7.84% Zn, 0.15% Pb, 0.073% Cu, 0.09 oz.Ag/ton and 0.001 oz.Au/ton. Other samples have shown silver to be present in the 0.2 to 0.3 oz./ton range when lead reports at the 1% to 2% level, suggesting a close association between these elements. The maximum gold value returned from the mineralized zone, to the knowledge of the writer, is 0.004 oz.Au/ton.

Argentex has carried out chip sampling across the mineralized zone, as well as a form of bulk sampling (referred to as semi-bulk sampling by the writer). This latter procedure involved the selection of representative samples of the mineralized material (fresh rock, each weighing 10 to 15 pounds) at various locations across the zone. Sampling locations are shown herein as Figure 6. The results of these samplings, with check analysis results, are shown in the following tabulations:

TABLE I

CHIP SAMPLE ANALYSES - ARGENTEX SAMPLES

(BW - samples analyzed by Bell-White Analytical Laboratories) (BC - samples analyzed by Bondar Clegg Laboratories Ltd.)

Sample No.	Length (ft.)	% Zn (BW)	% Zn (BC)	% Pb (BW)	% Cu (BW)	oz.Ag/ton (BW)
2328	3.0	0.03	_	0.03	_	trace
2329	3.0	1.99	2.04	0.35	0.006	0.09
2330	3.0	0.59	-	0.28	0.004	0.04
2331	4.0	0.34	_	0.19	0.009	0.02
2332	2.0	0.06	_	_	_	trace
2333	5.0	1.32	-	1.03	0.003	0.22
2334	4.0	2.04	2.28	0.33	0.007	0.13
2335	4.0	1.15	-	0.47	0.029	0.13
2336	3.0	0.07	_	_	-	-

From Table I, the weighted average of chip samples across a 25 foot width (samples 2329-2335 inclusive) is 1.14 percent Zn, 0.44 percent Pb, 0.01 percent Cu, and 0.10 oz.Ag/ton, using Bell-White analyses.

TABLE II

SEMI-BULK SAMPLE ANALYSES - ARGENTEX SAMPLES

- (BW samples analyzed by Bell-White Analytical Laboratories)
- (BC samples analyzed by Bondar Clegg Laboratories Ltd.)

Sample No.	% Zn (BW)	% Zn (BC)	% Pb (BW)	% Cu (BW)	oz. Ag/ton (BW)
2342	2.80	4.80	1.56	0.011	0.29
2343	5.56	_	2.10	0.015	0.21
2344	5.30	7.24	1.22	0.012	0.32
2345	1.51	_	0.91	0.003	0.16
2346	1.82	-	1.01	0.006	0.13
2347	2.24	3.08	0.72	0.013	0.22
Average Value	3.21		1.25	0.01	0.22

Note: The average variation of the 3 Bondar Clegg analyses for zinc from the corresponding Bell-White analyses is + 49%. If this correction is applied to the overall Bell-White average for zinc, a value of 4.78 % Zn is indicated.

Regarding the foregoing tabulations, the reason for the rather wide variation between the Bell-White and Bondar Clegg zinc analyses is not clear. It is possible that the sample material submitted differed somewhat, and/or that different analytical procedures were utilized. Such variations have been known to result from the employment of different methods of sample preparation (crushing and splitting), and it is quite possible that this was an effective agency in this case.

In any event, it is evident that a substantial zone of lead-zinc-silver mineralization exists in this prospect location, and its extent and grade have not been adequately determined. The zone should be exposed insofar as possible by trenching, and thorough bulk sampling done to provide a dependable determination of its metal content.

GEOPHYSICAL SURVEYS

GENERAL COMMENTS:

Reference has already been made to the aeromagnetic survey completed by the G.S.C. over the property area, and shown in Figure 4. It will be noted that this aerosurvey was carried out on flight line spacing of at least 1/2 mile, and that the flight line direction is parallel to structure in the Argentex property area. Contouring of magnetic data in this instance is thus highly interpretive, and not of great value in the detailed sense.

During 1964, O'Leary Malartic Mines Ltd. performed a self potential survey and some electromagnetic work over what is now the south-central part of the Argentex Price property. This work was done under the supervision of C.T. Bischoff, and the records are available in the assessment files of the Ontario Division of Mines. The program was designed to trace the heavy pyritic mineralization noted in the vicinity of the two shallow shafts opened by previous operators. This was not accomplished, and although some anomalous conditions were detected, they are difficult to resolve with known geological conditions, and more recent geophysical survey data.

In August and September, 1981, ground magnetic and VLF-EM surveying were completed over the West property area by Argentex. This work was carried out on 400 foot line spacing over a base line length of 10,800 feet. The results of these surveys are shown herein on Maps No. 2 and No. 3 (in pocket), and are discussed in the following sections.

GROUND MAGNETIC SURVEY:

The ground magnetic survey data shown contoured on Map No. 2 presents a picture radically different from that of the prior aerosurvey. Three main features emerge, namely (1) the arcuate area of high magnetics at

the north end of the grid area; (2) the sinuous zone of high magnetics just east of the base line from 0+00 to 48+00N; and (3) the persistent north-trending "low" which carries over almost the entire grid area, and lies about 1200 feet east of the base line.

If it is assumed that the more extensive areas of high magnetic readings are due to the presence of magnetite-rich beds within the iron formation sequence, and making allowances for magnetic irregularities caused by diabase dikes and granitic intrusive material, an extensive major fold structure can be recognized covering most of the grid area. It appears that the iron formation unit enters the northwest extremity of the grid area on a northwest strike; swings to the south in the vicinity of 10+00E on Line 96+00N; extends in a southerly direction along the base line to the 0+00 point; and thence swings northwesterly towards the Grassy River. The persistent "low" would thus define the axis of a large anticlinal fold, plunging about 60°N, and overturned to the west. Limited geological data suggests that a nose of intrusive granite exists in the 52+00N to 80+00N area of the base line, disrupting the continuity of the iron formation in this area.

The iron formation unit appears to consist of multiple oxide-rich bands, probably separated by pyritic amphibolitic material. In places two main oxide-rich strata seem identifiable. Minor folding within the iron formation is intense.

No ground magnetic work has yet been done in the East property area. Both iron formation and serpentinite exist in this area, however, and faulting is interpreted as present. Magnetic data will thus prove very helpful in structural analysis in this location.

VLF-EM SURVEY:

The Argentex VLF-EM ground survey was performed with a Phoenix VLF-2 instrument, and run on the existing grid at 400 foot line spacing. The

data has been processed by the Fraser Filter method (Appendix III), yeilding contourable values over the grid area, and these are shown on Map No. 3 (in pocket). The Annapolis VLF transmission signal was utilized in the survey process.

The VLF-EM survey method is a very sensitive one, sometimes responding to overburden and sub-crop conditions. However, it is also responsive to disseminations of conductive material in bedrock, such as pyrite or graphite. As such, and considering the nature of the mineralized material known to exist in the Argentex prospect area, the method is thought well-suited to the definition of sulphide-rich zones within the iron formation sequence.

In reference to Map No. 3, a conductive response is apparent in the Argentex prospect location (north of Line 16+00N at approximately 6+50E). The stronger conductivity in this vicinity lies to the west of the prospect location, however, and is of unknown source. Co-incident magnetic activity is strong in the prospect location, and throughout the immediate area.

In general the conductive areas outlined by the VLF-EM survey follow the defined magnetic trends, though numerous responses not associated with magnetic "highs" are noted. Also, the conductivity range in the survey area is of a moderate order, somewhat less than what would be expected from, say, massive sulphides. Anomaly definition is distinct, however, and in terms of strength, may well be derived from sulphide disseminations of the intensity known in the Argentex prospect area.

On Map No. 3, nine conductive locations have been identified in the West property area (Anomalies A to I inclusive). These have been selected on the basis of (1) good magnetic association, (2) conductivity value in the 20+ unit range, and (3) extension of conductivity over at least a 400 foot length. Aside from the south end of the "A" anomaly (the Argentex prospect location), and the north end of the "B" anomaly (pyritic material

in dump from shallow shaft), nothing is known of the conductive material existing in these anomalous locations.

INTERPRETIVE CONSIDERATIONS

The iron formation-associated lead-zinc-silver mineralization occurring on the Argentex prospect location is of a type previously unknown in the area. It appears to be a fracture-controlled concentration, possibly of syngenetic origin. However, whether the mineralization is syngenetic, or hydrothermally-generated from an outside source, the iron formation unit is demonstrated a favourable host.

In the prospect location, moderate conductivity is associated with the known mineralized zone. There are areas of much stronger conductivity in the immediate vicinity, which may indicate the presence of heavier pyritic mineralization containing more or less sphalerite, galena and/or chalcopyrite. Folding is present in the prospect exposure, and it may well be that the more strongly deformed and fractured areas within the iron formation will prove most favourable for the concentration of valuable sulphides.

Initial sampling of the very limited Argentex prospect exposure has yielded variable results. Chip sampling has indicated a grade of 1.14 percent zinc and 0.44 percent lead over a 25 foot width, while a series of larger "representative" samples have shown that average values as high as 4.78 percent zinc and 1.25 percent lead may exist over the 25 foot section. It is believed that, because of the erratic nature of the mineralization, chip sampling is an innaccurate procedure, and that bulk sampling methods must be utilized for effective evaluation.

In respect to the other anomalous areas identified within the survey area, all exhibit characteristics similar to those of the prospect locale. While the VLF-EM survey method is known to be sensitive to a number of extraneous influences, these anomalies appear related to bedrock conditions.

As such, they constitute bona fide exploration targets.

Little is known of the East property area at this time. Favourable iron formation units do extend into the area, however, and ultrabasic rocks and structural complexities do exist here. This area thus warrants careful exploratory attention.

EVALUATION REQUIREMENTS

GENERAL CONSIDERATIONS:

The Argentex prospect location requires bulk sampling. Several hundred pounds of material from the exposed zone should be removed, sorted, and carefully assayed. Additional trenching and stripping may also prove possible in the vicinity, and potential sites for such work can be identified by detailed inspection.

While such work is necessary, it will not be sufficient for full evaluation of the prospect area. Provision should therefore be made for shallow, large diameter drill testing (NX) on the prospect, on its extension, and on the other anomalies in proximity. The latter requirement could probably best be served by drilling an exploratory section across the entire anomalous zone on, or to the north of, the 16+00N Line.

Other designated anomaly areas should be closely inspected as to possible trenching sites. Outcrop conditions are generally good within the grid area, and this would provide the cheapest and most effective means of performing initial evaluation of these targets.

It should be recognized that within this area, strong concentrations of valuable sulphide mineralization may not occur in precise association with loci of maximum conductivity, and indeed, may not coincide with heavily pyritized areas at all. Accordingly, it is suggested that soil geochemical surveying over the grid area may prove helpful in identifying

"active" anomaly areas for thorough evaluation.

The East property area is of definite exploratory interest, and should be covered by magnetic and VLF-EM surveying in the same manner as the West claim area. Geochemical soil surveying should also be extended over this area.

These requirements are of an immediate nature, and do not provide for anything other than superficial evaluation of targets outside of the known prospect location. Additional work in these areas will certainly be required, but it is difficult to estimate its extent at this time. In any case, provision will be made in the following sections for a second stage of evaluation, consisting mainly of drilling. The type and extent of this drilling will, of course, depend on the experience gained in the evaluation of the known prospect, and information obtained in other areas through trenching, geochemical surveying, etcetera.

EVALUATION PROGRAM:

Stage I -

Work recommended in the main prospect location includes trenching in anomalous areas where overburden conditions permit, and, if possible, along the strike of the known mineralized zone. Bulk sampling of the prospect is also required.

Drilling is recommended in the main prospect location, to be done with large diameter holes (NX). Four 150 foot holes are suggested to be drilled under the prospect, and along strike at spacing from 50 to 100 feet. An additional four 200 foot holes may be drilled on an east-west section located at approximately 18+00N, moving east from 7+00E at 150 foot spacing. All holes are to be drilled at dip -45°, azimuth 270°. Provision is also made for 500 feet of additional drilling to be used as required.

Trenching and stripping in the other designated anomaly areas is recommended, as conditions permit. 100 hours of machine time and supporting labour is the estimated requirement.

Geochemical sampling of the entire West property grid area at 200 foot sample spacing is suggested. The "C" horizon (below humus and leached layers) should be sampled, and analysis for Zn, Pb, Cu and Ag carried out. About 550 samples will be involved.

A grid comprising approximately 6 line miles (400 foot line spacing) is recommended for the East property area. This grid should be surveyed by magnetic and VLF-EM methods, and sampled geochemically on the same basis as the West grid. Analysis for Ni should be added for the geochemical samples, however. About 250 geochemical samples will be collected in this area.

It is also recommended that some provision be made in the Stage I program to allow some detailed electromagnetic surveying. This will prove helpful for location purposes in anomalous locations.

Stage II -

The extent of on-going work on the Argentex Price property will, of course, depend in great measure on the results of the Stage I program. It is doubtful, however, if satisfactory evaluation of all the West property targets can be completed without recourse to drilling, and it is likely that new targets will be defined in the East property area.

Accordingly, provision for 10,000 feet of exploratory and development drilling is suggested as a reasonable estimate for future evaluation requirements. Trenching, bulk sampling, and support services will also be required.

COST ESTIMATES:

Stage I -

(1)	Drilling:	8 holes for 1500' @ \$30/ft\$ 500 ft. provisional @ \$30/ft Mobilization, Demob. cost	45,000 15,000 5,000
(2)	Trenching:	100 machine hrs. @ \$150/hr Support Labour	15,000 2,500
(3)	Geophysica	l: East Grid Linecutting East Grid VLF-EM/Mag Survey EM Detail Survey	2,000 2,500 2,000
(4)	Sampling:	Bulk Sampling, Main Prospect Area Sample Crushing & Splitting	1,000 1,500
(5)	Geochemica	l: W. Grid Sampling & Analysis E. Grid Sampling & Analysis	3,600 1,800
(6)	Geological	: Prospect & Grid Mapping	2,500
(7)	Other:	Supervision, Compilation	7,500 3,000 7,500 5,000 2,000
		Subtotal Contingencies	124,400
	Total Esti	mated Cost, Stage I Program\$	136,840
Stage II -			
(1)	Drilling:	10,000 ft. @ \$30/ft\$ Mobilization, Demob. Cost	300,000 5,000
(2)	Trenching:	150 Machine Hrs. @ \$150/hr	22,500 5,000
(3)	Sampling:	Bulk Sampling as required	5,000
(4)	Geophysica	l: Detail Survey, as required	5,000
(5)	Other:	Supervision, Mapping, Logging Assaying Travel, Accomodation Consulting, Report Preparation Administration	15,000 5,000 7,500 10,000 5,000

Stage II - Continued

Subtotal\$ Contingencies (@ 10%).	385,000 38,500	_
Total Estimated Cost, Stage II\$	423,500	_

Summary -

Total Estimated Total Estimated	Cost, Stage I\$ Cost, Stage II	136,840 423,500
Total Estimated	Cost\$	560,340

CONCLUSIONS

- 1. Argentex Resource Exploration Corporation holds 45 mining claims of good accessibility in the Townships of Price and Fripp, District of Cochrane, Ontario. Ownership is secure, and as represented.
- 2. A recently discovered lead-zinc-silver prospect exists in the south-central part of the claim area. It consists of fracture-controlled sulphide mineralization in stongly folded iron formation, and is exposed in a single trench.
- 3. The exposure has been sampled across a 25 foot width, yielding variable assay results depending on the sampling method employed. The zone is estimated to contain from 3 to 5 percent zinc, and approximately 1 percent lead and 0.2 oz.Ag/ton over the 25 foot section. However, bulk sampling will be required to establish a fully reliable grade figure. The strike length of the mineralized zone cannot be estimated with any reasonable accuracy at this time.
- 4. Magnetic and VLF-EM surveying has been completed over the West property area, including the prospect location. Coincident magnetic

anomalies and moderate conductivity are indicated in at least nine locations in the grid area, including the prospect locale.

- 5. Magnetic data indicates the West property area to be underlain by a large, northerly-plunging anticlinal fold. Associated minor folding appears strongly developed, and may well be an important factor in the locallization of base metal mineralization.
- 6. The iron formation, demonstrated as a favourable host for sulphide mineralization, extends into the structurally complex East property area. This area remains to be explored.
- 7. A two-stage evaluation for the property has been recommended to Argentex. The first stage provides for evaluation of the prospect, preliminary evaluation of other anomalous areas in the West property claims, and initial exploration of the East property area. Costs for this work are estimated at \$ 136,840. The second stage of evaluation, which will allow for on-going testing of the entire property area, is estimated to cost in the range of \$ 423,500. The extent and direction of the second stage program will depend, to some degree, on the results of the first.

RECOMMENDATIONS

The Price Township lead-zinc-silver prospect of Argentex Resource Exploration Corporation is the first of its kind located in the region. It is a substantially mineralized, fracture-controlled zone of unknown extent, and warrants thorough evaluation.

The possibilities for the existence of similar mineralized zones within the property area must be rated as very good. Accordingly, the continued evaluation of the property as a whole is fully warranted, and recommended.

The staged evaluation program developed herein is designed to provide the maximum information on the prospect and general property area at the minimum cost in the initial stage. On-going evaluation requirements are difficult to estimate at this time, but will necessarily consist mainly of test drilling. It is recommended that the suggested program be implemented by Argentex Resource Exploration Corporation.

Respectfully Submitted,

G.M. Hogg,

CERTIFICATE OF QUALIFICATION

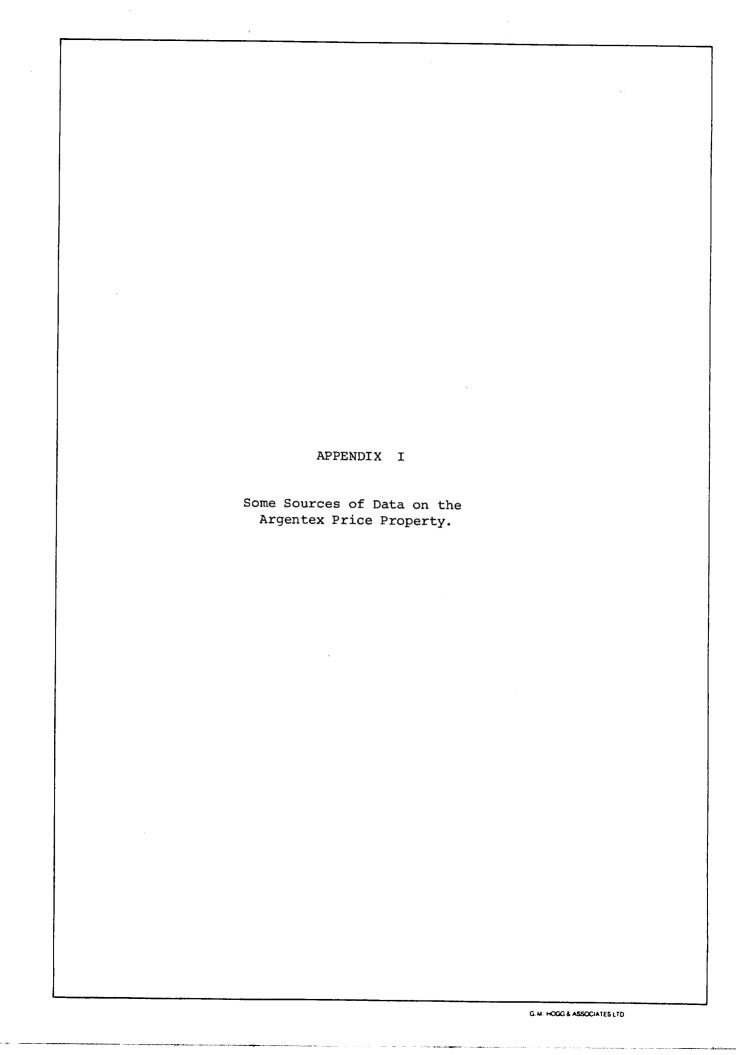
I, Glen M. Hogg, of the City of Toronto, County of York, in the Province of Ontario, Canada, do hereby certify that:

- 1. I am a Consulting Engineer, principal of the firm of G.M. Hogg & Associates Ltd., with an office located at 28 Thompson Avenue, Toronto, Ontario.
- I am a member of the Association of Professional Engineers of Ontario, a registered Consulting Engineer with that organization, and designated as a Specialist in the Field of Geological Engineering, Classes of Exploration and Development, as per Regulation 59/73 of the Professional Engineers Act, R.S.O. 1970.
- 3. I am a graduate of Queen's University of Kingston, Ontario, having received the degree of Master of Science in Geological Sciences from the Faculty of Applied Science in 1952. I have since practised professionally in the field of mineral exploration and development.
- 4. I have knowledge of, and experience in the region in which the Argentex Price property is located.
- 5. In addition to my personal knowledge of the area, I have made use of the records of the Ministry of Natural Resources of Ontario, and Argentex Resource Exploration Corporation in the preparation of this report. I examined the property relevant to this study on August 26, 1981.
- 6. I have no interest, direct or indirect, in the property on which this report is written, nor do I expect to receive any.

Dated this 14th day of Fatoury, 1982

G.M. Hogg, P.Enp G.

POLINCE OF ONT



Listing of Sources of Information on the Price Township Area.

The Porcupine Gold Area; O.D.M. Vol. 33, Pt.2. A.G. Burrows, 1925

Geology of McArthur, Bartlett, Douglas and Geikie Townships, District of Timiskaming; O.D.M. Vol. 35, Pt.6. E.L. Bruce, 1926

Geology of Price Township; O.D.M. Prelim. Map P.30, 1957

Geology of Ogden, Deloro and Shaw Townships, District of Cochrane; OFR 5012. H.D. Carlson, 1967

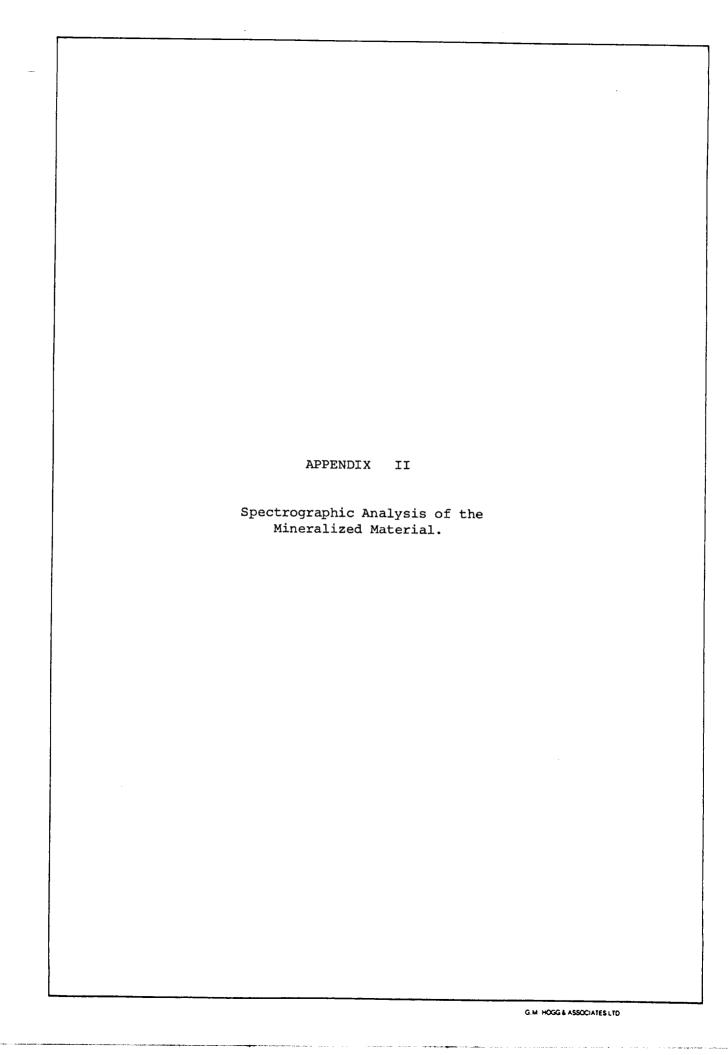
Timmins-Kirkland Lake Compilation Sheet; O.D.M. Map 2205, 1973

Aeromagnetic Survey Sheet; Geol. Survey of Canada, Map 8453G, 1970

Timmins Area; O.D.M. Prelim. Map P.941, 1974

O'Leary Malartic Mines Ltd. Self Potential Survey, Report and Plan. O.D.M. Assessment Files, 1964.

Records of Argentex Resource Exploration Corp., 1981



X-RAY ASSAY LABORATORIES LIMITED

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TELEX 06-986947

CERTIFICATE OF ANALYSIS

REPORT 12596

REF. FILE 8306-M6

17-SEP-81

TO: ARGENTEX RESOURCE CORP. LTD.

85 RICHMOND ST. W., SUITE 600.

TORONTO, DNT.

M5H 2E8

CUSTOME

DATE SUBMITTED

14-AUG-81

1 ROCK

ELEMENT SENS	S¢	ELEMENT	SENS 	
	NO TA	G		NO TAG
ANTIMONY (4) ND	MANGANE	SE (1)	TL
ARSENIC (4) ND	MERCURY	(4)	ND
BERYLLIUM (2) . ND	MOLYBDE	(E)MUM	FŤ
BISMUTH (2) ND	NICKEL	(1)	FT
CADMIUM (4) ND	SILVER	(1)	FT
CERIUM (5) ND	TANTALL	M (5)	ND
	4) ND	THORIUP	(3)	ND
CHROMIUM (4	4) ND	TIN	(2)	FT
	3) FT	TITANIU	M (2)	TL
	1) FT	TUNGSTE	N (4)	ND
GALLIUM (2) FT	URANIUM	(3)	ND
GERMANIUM (1) ND	VANADIL	M (2)	FT
IRON (2) H	YTTRIUM	(3)	ND
	2) L	ZINC	(4)	Н
LITHIUM (4) ND	ZIRCONI	UM (4)	ND

LEGEND

KEY TO SYMBOLS

Н	-	10% PLUS	L	-	0.1-1%
МH	-	5-15%	TL	-	0.05-0.5%
M	-	1-10%	T	_	0.01-0.1%
LM	-	U•5-5%	FT	-	0.01% OR LESS
			ND	-	NOT DETECTED

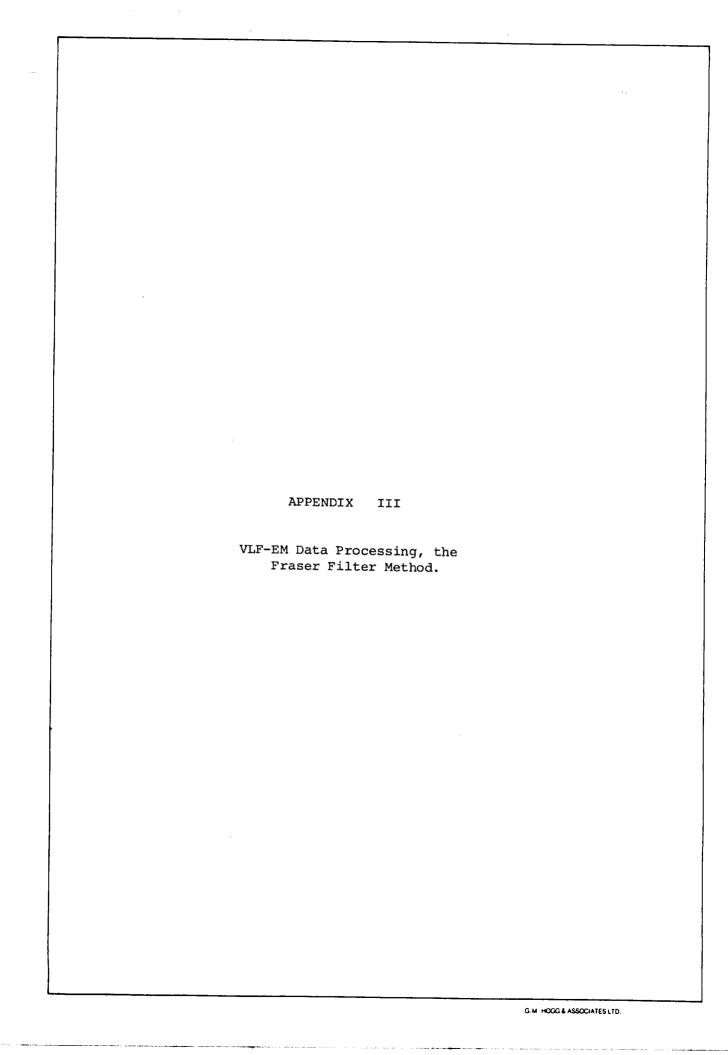
#SENSITIVITY
(LIMIT OF DETECTION)
1 - 0.0005-0.001%

2 - 0.001-0.005% 3 - 0.005-0.01%

4 - 0.01-0.05%

5 - 0.05-0.1%

NOTE: BETTER SENSITIVITIES CAN BE OBTAINED WITH SPECIAL TECHNIQUES. IF AND WHEN REQUIRED.



VLr-EM Data Processing

D. C. FRASER, Chief Geophysicist, Geophysical Engineering and Surveys Limited, (Keevil Mining Group Limited), Toronto, Ontario

ABSTRACT

Geophysical Engineering and Surveys Limited of the Keevil Mining Group have routinely conducted ground surveys with VLF-EM receivers for the past two years. Both Crone's Radem and Ronka's EM16 have been used. VLF-EM dip-angle data often yield complex patterns which require considerable study for a proper interpretation. A method was developed which allows field operated in the control of the c

VLF-EM dip-angle data often yield complex patterns which require considerable study for a proper interpretation. A method was developed which allows field operators to transform the noncontourable dip angles into contourable data, producing conductor patterns which are immediately apparent to exploration personnel untrained in VLF-EM interpretation.

VLF-EM contoured data generally peak very close to the top of a conductor, thereby allowing drill holes to be spotted accurately. However, the data generally should not be used alone to select drill targets because structures may be sufficiently conductive to yield strong anomalies. Thus, magnetic and/or vertical-loop EM correlations may be considered as necessary criteria for drilling.

Thus, magnetic and/or vertical-loop EM correlations may be considered as necessary criteria for drilling.

VLF-EM surveys can replace IP surveys in certain environments. For example, the Restigouche orebody in the Bathurst camp of New Brunswick yielded a VLF-EM anomaly as distinct as that obtained by IP, although the body did not respond to vertical- or horizontal-loop EM. However, the cupriferous breccia pipes of the Tribag mine near Batchawana, Ontario yield strong IP anomalies but not VLF-EM anomalies, illustrating that disseminated ore 'argets should be sought with IP rather than with VLF-EM.

INTRODUCTION

A METHOD HAS BEEN DESCRIBED (Fraser, 1969) which enables somewhat noisy, noncontourable dip-angle data to be transformed into less noisy, contourable data. This data processing is performed routinely by



D. C. FRASER obtained a Bachelor's and a Master's degree in geology at the University of New Brunswick and, in 1966, a Ph.D. degree in geophysics at the University of California at Berkeley. He has performed research on induced polarization, resistivity, magnetics, gravity and electromagnetics, including the design of new interpretation methods employing, in part, digital filtering and correlation techniques. Recently, he has been involved to a considerable

extent in mapping conductivity inhomogeneities, first with ground equipment as a thesis problem, and then with airborne equipment in collaboration with Barringer Research Limited.

Dr. Fraser has worked for several petroleum and mining companies and currently is chief geophysicist of Geophysical Engineering & Surveys Limited, a member of the Society of Exploration Geophysicists and of the CIM, and a past president of the Canadian Exploration Geophysical Society.

'APER PRESENTED: at the 72nd Annual General deeting of the CIM, Toronto, April, 1970.

KEYWORDS: Geophysical exploration, Data processing, Electromagnetic surveys, Dip angles, VLF-EM surveys, Filter theory, Contouring.

CIM TRANSACTIONS: Vol. LXXIV, pp. 11-13, 1971.

field personnel, and simply involves additions and subtractions.

Both magnetic and VLF-EM data can be collected by a single individual as part of a ground evaluation program. The VLF-EM method can provide contour maps which may be as useful to exploration geologists as magnetic maps. The key to the usefulness, however, lies in the data processing, because raw dipangle data frequently are more confusing than elucidating. This point is illustrated in Figure 1, which presents dip-angle data from the Temagami mine in Ontario. Clearly, the complex pattern requires some thought for proper interpretation. Conversely, Figure 2 provides a conductor pattern which is immediately apparent even to those untrained in VLF-EM interpretation. It is obtained from the data of Figure 1, using the method described in the Appendix. The contoured units are expressed in degrees. Only the positive quantities are contoured.

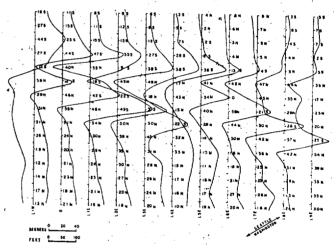


FIGURE 1 — Dip-angle VLF-EM data in the vicinity of the Temagami mine. The arrow defines the primary field direction from the transmitter at Seattle, Washington (after Fraser, 1969).

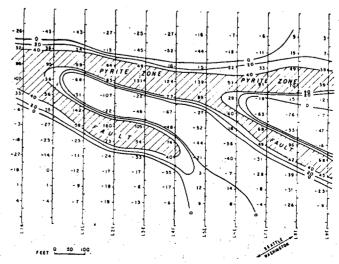


FIGURE 2 — Contoured VLF-EM data, in degrees, as calculated from the map of Figure 1 (after Fraser, 1969).

FIELD EXAMPLES

The following field examples were chosen to illustate the three primary uses to which VLF-EM has been applied by Geophysical Engineering and Surveys Limited.

General Prospecting

General prospecting or ground evaluation provides the most common use for VLF-EM. Ground often is obtained which requires only a general approach to exploration, as when there is insufficient geological information regarding the specific target sought. In such cases, magnetic and VLF-EM surveys are routinely performed without the guidance of a geophysicist. VLF-EM conductors are tested by short traverses with vertical-loop EM. The anomaly patterns generally are sufficiently clear so that mapping, trenching, drilling or abandonment will be decided without consulting a geophysicist. Exceptions can occur when patterns become complex.

Figure 3 illustrates a survey in which two strong VLF-EM conductors were obtained. The southern anomaly has vertical-loop EM correlation and the northern one does not. The VLF-EM anomaly with vertical-

FIGURE 3—Contoured VLF-EM in degrees and verticalloop EM profiles (1,200 hz) from a property evaluation survey in the Uchi Lake area.

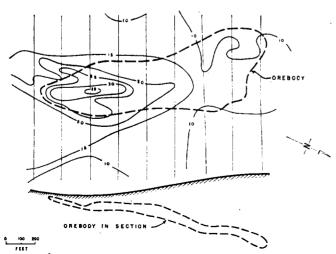


FIGURE 5 — Gradient-array IP chargeability in milliseconds over the Restigouche orebody, for comparison with the VLF-EM data of Figure 4.

loop correlation also coincides with a magnetic anomaly, and probably is due to magnetic sulphides. It will be drilled shortly. The other equally strong VLF-EM anomaly without vertical-loop correlation does not parallel the magnetic patterns, and probably is due to a fault.

In Place of IP

There are certain environments where VLF-EM can be used as an alternate to IP. These are the environments characterized by massive or heavily disseminated sulphides which occur within 300 feet of surface and yet do not respond to conventional EM. IP was considered to be the most suitable geophysical method for the detection of such bodies (Hallof, 1967). However, it is well worth testing VLF-EM in these environments because of the very substantial cost savings that result if the method is responsive. As an example, Figure 4 illustrates a VLF-EM survey over the Restigouche orebody in the Bathurst area of New Brunswick. Figure 5, showing IP chargeability contours, allows a comparison to be made of the relative merits of IP and VLF-EM for this type of mineralization. The Restigouche body did not respond to vertical- or horizontal-loop EM because of the high sphalerite content of the massive sulphides.

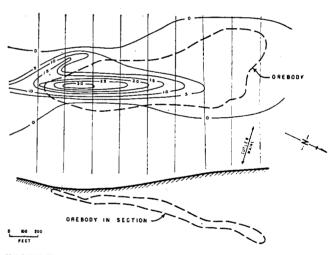


FIGURE 4—Contoured VLF-EM in degrees from the Restigouche orebody, illustrating that the method is a viable alternate to IP in this environment (cf. Figure 5).

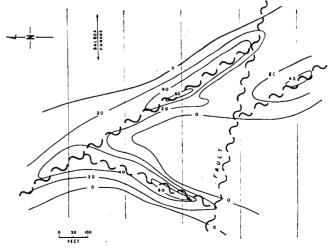


FIGURE 6 — Contoured VLF-EM in degrees from a fault-mapping survey in the Cobalt area.

Other environments described in Hallof (1967) would not be as amenable to the use of VLF-EM in place of IP. A truly disseminated copper deposit will not] ide a VLF-EM anomaly but will yield a large IP effect, as was found to be the case for the breccia pipes of the Tribag mine near Batchawana, Ontario.

Structural Interpretation

Inasmuch as VLF-EM responds well to structures, the method has been applied to the mapping of faults. An example is shown in Figure 6, which depicts a portion of a survey in the Cobalt area of Ontario. The property was a silver prospect where the veins were postulated to be associated with faults. VLF-EM appeared to be the most reasonable geophysical method available to aid in tracing these faults. Considerable drilling has been done on this property, and the fault interpretation was verified.

Figure 2 illustrates that faults can be as conductive to VLF-EM as massive pyrite. In this Temagami example, the faults contain a brecciated matrix with some hematite cementing. They yield a strong IP anomaly, but are non-conductive to conventional EM.

DEPTH OF EXPLORATION

The relatively high transmitted frequency of approximately 20,000 hz severely limits the depth of exploration in areas of conductive overburden. As an example, penetration of the 100 to 200 feet of clay in the Timmins area often is not achieved.

In regions where the overburden has a less exceptional conductivity, such as the Bathurst area, depth of exploration generally is limited to about 300 feet. This depth was predicted from model curves in Fraser (1969), and appears to be true in practice, as over the Restigouche deposit (Figure 4).

CONCLUDING REMARKS

VLF-EM surveys are exceptionally easy to perform, but the dip-angle data may be exceedingly difficult to interpret correctly. This latter point has produced unfavourable comments regarding the utility of VLF-EM as a prospecting tool. The data-processing method used to transform somewhat noisy, noncontourable dip angles into less noisy, contourable data greatly increases the value of VLF-EM surveys.

The efficiency of data flow is significantly increased in the case of an active mining company performing such surveys in large quantities. This is because the contoured maps may be used directly by geologists in charge of their various projects, rather than requiring a geophysicist to study each dip-angle

Contoured VLF-EM maps form a useful complement to magnetic maps. The survey and data-processing cost is similar to that for a hand-held fluxgate magneto-

For general exploration in the Shield, VLF-EM conductors generally should be tested with vertical-loop EM to separate massive sulphides (and graphite) from conductive structures. As such structures can be mapped with VLF-EM, this provides another use for the method. Further, some massive and heavily disseminated sulphides, which do not respond to conventional EM, will yield VLF-EM anomalies as distinct

as those obtained by IP. These three uses of VLF-EM, i.e., for general prospecting, mapping of structures and as a judicious alternate to IP, form our primary applications of VLF-EM to property evaluation.

APPENDIX

The Data-Processing Technique

THE DATA-PROCESSING TECHNIQUE is described in detail by Fraser (1969), where it is also discussed in terms of filter theory*. The method is very simple to apply, as is shown by the example of Figure 7. This figure illustrates that the contourable quantity is the sum of the values at two adjacent stations minus the sum at the next two adjacent stations. The abovereferenced paper presents a tabulation method suited to the processing of this dip-angle data. The calculations are performed in the field by the instrument operators.

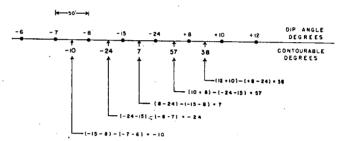


FIGURE 7-- Example of the data processing calculations, illustrating that the contoured quantities are obtained simply from additions and subtractions performed on the dip angles.

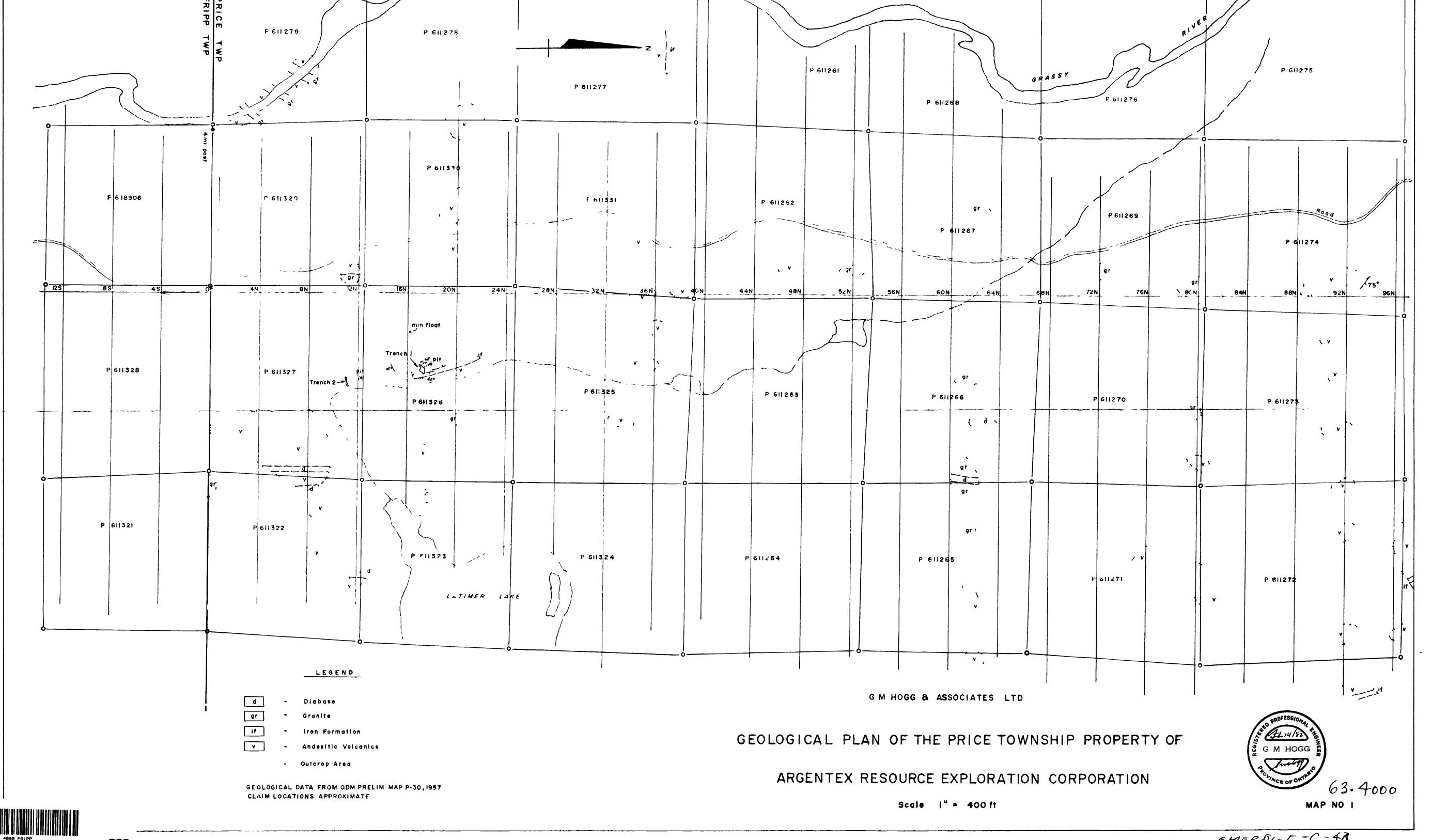
A 50-foot station interval is recommended to avoid the problem of near-surface conductors appearing as deeper conductors, as could occur if the station spacing was larger. In actual practice, data are collected at 100-foot intervals, with 50-foot readings being taken where anomalies occur. Later, 50-foot artificial data are interpolated in non-anomalous areas prior to performing the calculations. This procedure avoids some confusion in the contour patterns which would result from near-surface 'geological noise'.

Normally, only the positive values are contoured, because the negative quantities generally represent anomaly flanks. Consequently, the inclusion of negative contours would serve only to confuse the conductor patterns. However, if a backward crossover was produced by a geological source, an erroneous interpretation of the contour map and the dip-angle profiles would result. To date, such a crossover has not been recognized on the predominantly in-phase dipangle data.

REFERENCES

Fraser, D. C., (1969), Contouring of VLF-EM Data; Geo-physics, Vol. 34, pp. 958-967. Hallof, P. G., (1967), The Use of Induced Polarization Measurements to Locate Massive Sulphide Mineralization in Environments in which EM Methods Fail; paper presented at Canadian Centennial Conference on Mining and Groundwater Geophysics, Niagara, Ontario.

^{*}The technique is analogous to passing the dip-angle data through a bandpass filter which (1) completely removes DC bias and greatly attenuates long wave lengths, (2) completely removes Nyquist frequency noise, (3) phase-shifts all frequencies by 90 degrees and (4) has the bandpass centered at a wave length of five times the station spacing.



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