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REPORT

FOR

PAN ALASKA RESOURCES SA

PENNY, PERRY, PUMKIN AND PINKY CLAIMS VANCOUVER AND NEW WESTMINSTER M.D.

INDIAN RIVER AREA

BRITISH COLUMBIA

N.T.S. 92G/10W 49°33'N 122°53'W

F.R. Gigliotti F.J.R Syberg

W.G. Timmins Exploration & Development Ltd. Candell Consulting Corporation

August, 1983

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SECTION I

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GEOLOGICAL PROGRAM

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SUMMARY

Pan Alaska Resources SA holds 58 claim units in the Vancouver and New Westminster Mining District 20 kilometers southeast of Squamish, B.C. The claims are underlain by volcanic and sedimentary 'roof pendant' rocks of the Gambier Group, granitic rocks of the Coast Plutonic Complex and pyroclastic rocks, dykes and lavas of the Garibaldi Group. The claims were acquired in 1982 and a low level airborne geophysical survey was flown over the property during the summer of 1982. The northern part of the claim block was examined in July, 1983 and the geologic information was compared with the results of the airborne survey. Correlation between the geologic and geophysical information suggest that this type of airborne survey can be useful in predicting the location and structure of Gambier 'roof pendants' within the Coast Plutonic Complex. [

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1. Objective of the 1983 Field Program

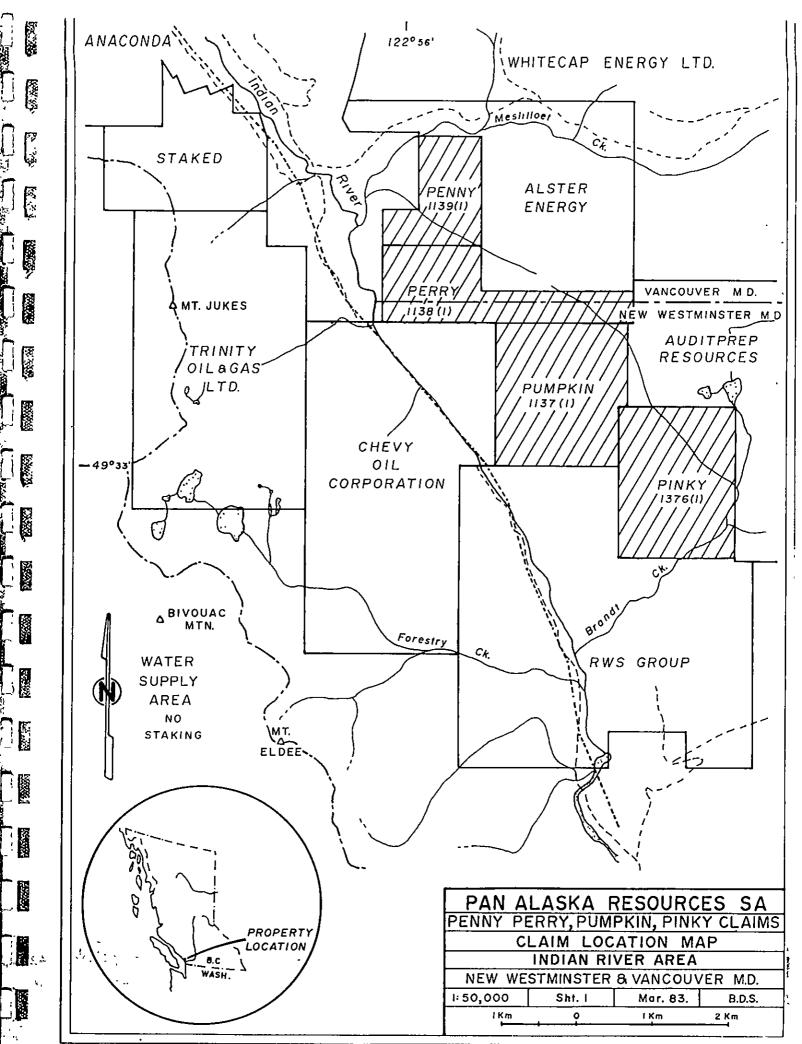
The 1983 field program was initiated to determine the usefulness of a low level magnetic airborne survey in predicting the location and structure of Gambier Group 'roof pendant' rocks within the Coast Plutonic Complex.

2. Pan Alaska Resources SA Claims

The following mineral claims, owned by Pan Alaska Resources SA, were examined in 1983:

Name	Number of Units	Record Number	Record Date
Penny	16	1139	Jan 6, 1983
Perry	14	1138	Jan 6, 1983
Pumkin	16	1137	Jan 6, 1983
Pinkey*	12	1376	Jan 6, 1983

*Pinkey is in the New Westminster Mining District; Penny, Perry and Pumkin are in the Vancouver Mining District.



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3. Location, Access and Topography

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The Pan Alaska claims are located 20 kilometers southeast of Squamish, B.C. near the confluence of Meslilloet Creek and Indian River. The Indian River Valley is accessible by logging road from Squamish. Access to the northern part of the claim block is by poor logging road which, via the Meslilloet Creek road, joins the Indian River road near the confluence of the two streams. The southern claims are accessed by a similar road which follows Brandt Creek. The central part of the property is not accessed by road and, due to heavy forest cover, is probably only accessible by foot.

The topography is dominated by steep, mountainous terrain with local relief variations of over 500 meters. The property is dissected by steep walled, northwest trending creek valleys.

The heavy forest cover is comprised of Douglas Fir, cedar and hemlock. Creek valleys and logged areas are sites for growths of low brush including slide willow, devil's club and thickets of blueberry, huckleberry and salmon berry. Off road travel is very slow and difficult.

4. Mining History

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Interest in the Squamish area was initiated in 1898 with the discovery of the extensive copper showings of the Britannia mining camp. From 1905 to 1974 orebodies within the Britannia shear zone produced 55 million tons of ore grading 1.10% copper, 0.65% zinc, 0.20 oz/ton silver and 0.02 oz/ton gold. From 1908 to 1911 a number of copper showings were discovered in the Indian River Valley area. Many of these showings were acquired by the Howe Sound Company which controlled the Britannia Mine. Showings in the Raffuse Creek area were optioned by various companies and are presently held by Kidd Creek Mines Ltd. In 1976 copper-lead-zinc showings were discovered in the pass between the Indian and Stawamus rivers. These showings are presently held by Maggie Mines Ltd. In 1982 Maggie discovered copper-zinc mineralization about one kilometer southeast of the Indian-Stawamus pass on the southwest side of the Indian River Valley. This showing also contains considerable values in gold. It should be noted that gold has not been of major importance in any of the previously known deposits of the area. Exploration of several showings in the Indian River Valley area is currently underway.

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5. 1982-1983 Program

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5.1 Airborne Geophysical Survey

During the summer of 1982, a low level magnetic survey was flown over the claim area. The raw geophysical data was processed by Candell Consulting Corporation and a 1:10,000 scale set of enhanced total magnetic field maps were produced in July, 1983. The maps are included in Appendix B (refer to Section II report by Candell Consulting Corporation).

5.2 Geologic Survey

A four day field examination was carried out on the Penny claim by the writer in July, 1983 using Squamish as a base. The examination consisted of mapping the contact between Gambier Group and Coast Plutonic Complex rocks.

5.3 Geophysical Interpretation

An interpretation of the geophysical data was produced by F. Syberg of Candell Consulting Corporation. This interpretation was revised with the incorporation of the geologic information. The revised map appears in Appendix B (refer to Section II report by Candell Consulting Corporation).

REGIONAL GEOLOGY

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The map area is underlain by three main geologic units:

- a. 'Roof pendants' of metavolcanic and metasedimentary rocks of the Upper Jurassic to Lower Cretaceous Gambier Group,
- Granitic rocks of the Cretaceous Coast Plutonic
 Complex, and
- c. Pyroclastic rocks, dykes and lavas of the Tertiary to Recent Garibaldi Group.

1. Gambier Group

The Gambier volcanic rocks range in composition from andesite (greenstone) to rhyolite. The greenstones are dominantly flows and sills with minor associated pyroclastic units. The felsic rocks are mostly tuff and agglomerate with porphyritic domes or flows near volcanic 'centres'.

Andesite is the dominant rock-type in the Goat Ridge-Sky Pilot Mountain area where alteration of original textures makes it difficult to distinguish between tuffaceous rocks and flows or sills. Rhyodacite tuff, agglomerate and porphry are common in the Mt. Baldwin - Mt. Mulligan area. Thick tuffs (locally up to several hundred meters) with coarse porphyritic clasts are interbedded with porphyritic dacite and rhyodacite. The dacitic rocks are thought to have originated as either subvolcanic sills or extrusive domes. The felsic pile also contains minor sedimentary rocks and more basic volcanic rocks.

Sedimentary rocks, mostly shale argillite and siltstone, are present in most sections of the Gambier Group.

2. Coast Plutonic Complex

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Quartz diorite is the dominant granitic rock but granodiorite is common in the western part of the area. Both mafic (mainly hornblende and biotite) rich and poor phases of these rock types have been observed. Magnetite rich phases of quartz diorite occur northeast of Sky Pilot Mountain, northeast of Mt. Habrich and on the ridge between Skookum Creek and Mamquam River. The magnetite rich phases tend to have higher mafic mineral contents.

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3. Garibaldi Group

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Intrusive and extrusive rocks of late Tertiary to Recent age are present throughout the area. The Ring Creek flow, between Ring and Skookum Creeks, is composed of dacite and is one of the longest acid lava flows on earth. Smaller dacite flows are present on Mt. Mulligan and on the Skookum Creek - Manquam River divide.

Andesite and basalt dykes of Tertiary or younger age cut all other rocks in the area. Although widespread they are not numerous in any one area.

4. <u>Mineralization</u>

The Gambier Group rocks in the Squamish area host a large number of mineral deposits and showings. The Britannia deposits were of great economic importance and some of the many smaller deposits within the area may also prove to be commercially viable ore producers.

The Britannia copper-zinc orebodies are interpreted "...as volcanogenic in origin...deposited from hydrothermal and exhalative solutions related to contemporaneous dacite volcanism and then deformed

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during late shearing and faulting." (J.T. Payne et al, 1980, p. 700.) This mode of origin has been suggested for many of the other sulphide showings within the Gambier Group.

Pyrite, pyrrhotite, chalcopyrite, sphalerite and galena are the principal sulphides present on the Maggie Mines Ltd. property. Observations suggest the possible occurrence of a massive sulphide bearing volcanic belt parallel to and approximately six kilometers northeast of the Britannia mine area. Important gold and silver values have also been reported by Maggie.

Mineralization on the north flank of Mt. Baldwin consists of lenses, veins, stockworks and breccias containing chalcopyrite, sphalerite and galena in rhyodacitic volcanic rocks. These rocks occur along a sheared belt about one kilometer long.

DISCUSSION OF WORK AREA

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A low level magnetic survey was flown over the entire claim area but limited access allowed field examination of only the Penny and Perry claims.

1. Geological Program

A reconnaissance level mapping program was conducted over this area in order to distinguish between Gambier Group and Coast Plutonic Complex rocks. The rock units were mapped using the chain and compass method and were plotted on a 1:10,000 scale geologic map. Areas of mineralization within the Gambier Group were noted but no attempt was made to differentiate the Gambier metavolcanic and metasedimentary rocks. Observed faults and fractures and assumed faults were noted. The Gambier rocks within the map area strike east-west and dip steeply (85°) to the north.

The mapped area can be divided into two sections (refer to the geologic map in Appendix A). The northwest section is predominantly underlain by quartz diorite which is in contact with Gambier rocks at its southern boundary. The southeast section covers a zone (one kilometer wide) of interfingered quartz diorite and Gambier rocks. It is assumed that the two sections are U

separated by a northeast trending strike-slip fault. The fault's displacement is unknown. The entire map area is bounded on the southwest by a northwest trending fault (evidenced by the trace of a deeply incised creek valley).

There are no mapping control points in the vicinity of the chain and compass traverse so the base station (FG-9) was located by intersecting compass sightings to prominant geographic features.

2. Geophysical Interpretation

A review was made, in consultation with F. Syberg, Candell Consulting Corporation, of the Enhanced Total Magnetic Field maps of the claim area. It was difficult to correlate geophysical and geological trends due to lack of sufficient geological information. There was, however, a reasonable correlation between faults and geophysical lineations. In particular, the northwest trending major fault southwest of the mapped area parallels a major geophysical lineation (refer to geologic map and geophysical report by Candell Consulting Corporation). This fault may be the contact between Gambier Group rocks and Coast Plutonic Complex rocks. A smaller scale northeast trending fault within the mapped area also parallels a lineation on the geophysical map.

CONCLUSIONS

- 1. The Gambier Group Coast Plutonic Complex contact trends northwest through the map area. It is poorly defined and forms a zone at least one kilometer wide. The contact zone is comprised of a complex arrangement of Gambier Group metavolcanic and metasedimentary rocks interfingered with and surrounded by areas of Coast Plutonic quartz diorite. The Gambier Group rocks within the mapped area strike east-west and dip steeply to the north.
- 2. It has proved difficult to correlate geophysical interpretations with field observations due to the paucity of geologic information afforded by limited access and to the effects of topography on the geophysical data (refer to report by Candell Consulting Corporation). There is, however, a reasonable correlation between faults and geophysical lineations. The map area is transected by faults trending northeast and northwest.
- 3. The claim group is characterized by steep mountainous terrain, heavily vegetated, and with road access only to the northwestern sector, where recent geological mapping has been carried out.

4. It appears that favourable Gambier rocks occur in only a small section in the northeastern portion of the claim group, and Pyritic mineralization observed within the volcanic sequence is limited.

RECOMMENDATIONS

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Due to the limited favourable area, ruggedness of terrain, heavy vegetation and lack of access, thus producing very high cost exploration it is recommended that no further work be carried out at this time, however should exploration on nearby claims prove the discovery of economic mineralization, further geological mapping in detail, airphoto studies and geochemical soil sampling surveys could be carried out in areas identified as underlain by Gambier Group rocks.

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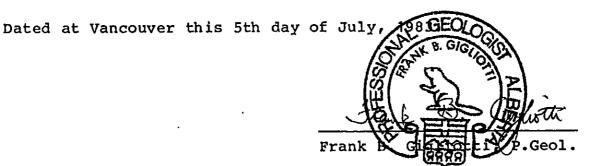
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CERTIFICATE

I, Frank B. Gigliotti, residing at 329, 8451 Westminster Highway, Richmond, British Columbia, do hereby certify that:

- I am a geologist having been practising my profession since 1975.
- 2. I am a graduate of the University of British Columbia having received a B.Sc. degree in Geology in 1975.
- 3. I am a member in good standing of the Association of Professional Engineers, Geologists and Geophysicists of Alberta.
- 4. I have no interest, direct or indirect, in the property or securities of Pan Alaska Resources SA, nor do I expect to receive any such interest.
- 5. This report is based on a study of private, government and published reports and maps and personal geological field work supervised by W.G. Timmins and conducted by myself and an assistant between July 25 and 28, 1983.

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SECTION II

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AIRBORNE GEOPHYSICAL SURVEY

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SUMMARY

A geophysical study of 230 line km aeromagnetic survey data has been conducted and a preliminary geological examination of an exploration target area completed by W.G. Timmins Exploration & Development Ltd. The enhancement of the aeromagnetic survey data has suppressed random characteristics which might interfere with interpretational objectives.

The extremity and variability of topographic relief in the survey area appears to have resulted in magnetic anomalies or anomaly contributions which locally may be in the order of 250 to 300 gamma. The topography in this area is primarily related to geology or geological events and this factor has negated the use of established methods for suppressing topographic magnetic effect using correlative procedures.

The contour map of the differences between the enhanced aeromagnetics and the upward continuation (60 meters) has highlighted a northwest trending linear anomaly in the west-central claims area. This anomaly is assumed to indicate the fault contact between volcanics of the Gambier Group and igneous intrusives on a vertical ensemble average basis.

INTRODUCTION

This study discusses the compilation of data, analysis using procedures familiar to modern signal theory and interpretations of an aeromagnetic survey carried out over the Penny, Perry, Pumkin and Pinky Claims during the summer of 1982. The survey was carried out by Columbia Geophysical Services Ltd., operator Mr. E.A. Dodd and navigator Mr. L. Brewer. The survey data were brought to the writer of this report for the purposes of a comprehensive computer aided study with the objective of delineating geological target areas. The areas outlined in this report have been submitted to W.G. Timmins Exploration & Development Ltd., Consulting Geologists, for geological ground examination and mapping.

This report has been submitted jointly with the geological report and, therefore, only the geophysical study will be discussed here.

A report by Mr. David G. Mark, of Geotronics Survey Ltd., March, 1983, has discussed and reported the survey operations, instrumentation and preliminary interpretation. Reference is made to this report submitted to provincial authorities and Pan Alaska Resources SA.

The total airborne survey coverage related to this report is approximately 230 line kilometers.

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DATA RETRIEVAL

The aeromagnetic data were recorded on strip charts during the field operations. During flight operation fiducial markers were electronically marked on the strip charts and the operator noted the numerical identifier of the fiducial marker.

These charts were entered into an OTRONA ATTACHE microcomputer using a Houston HIPAD digitizer. The digitization accuracy was 1 gamma which is equal to the survey instrument accuracy.

The locations of fiducial markers were obtained from Columbia Geophysical Services on a flight plan map. The positions were digitized using a mylar template at an accuracy of 0.25 mm which is equal to 2.5 meters on the original map scale. This is considerably below the accuracy in being able to locate an airborne observation platform in the terrain typical to the survey area.

The digitized coordinates were key-entered into the computer and merged with the digitized aeromagnetic data. High resolution video-screen display records of the digital information were used to validate all the information entered into the computer. $\left[\right]$

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The aeromagnetic measurements of the reported survey are presented in a contour form as submitted with this report. The contour interval is 100 gamma.

A matrix of equispaced total magnetic field values has been interpolated using the data along the flight lines and at 100 meter intervals. The purpose of this application has had two objectives. The first objective has been to produce a printer-plot representation using unique print characters for each contour interval on the original map scale of 1:10,000. The second objective has been to arrive at a presentation of the original survey data which would permit the use of statistical methods familiar to modern signal theory.

The interpolation technique employed during this project was an inverse distance squared weighing method. A search of the nearest two observed data points in each of four quadrants were used to compute each total magnetic field value in the matrix.

The final magnetic contour maps submitted with this report have been traced onto draughting film from the subsequent printer-plot contour representation maps. The accuracy of the location of the isomagnetic contours is plus or minus 10 meters laterally.

STATISTICAL ANALYSIS AND DATA ENHANCEMENTS

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The statistical procedures used in the reported study are based upon spectral analysis familiar to modern signal theory. The latter has become popular in the disentanglement of aeromagnetic maps over the past two decades, (Spector and Grant, 1969).

In recent developments, (Syberg, 1972 and 1983), it has been shown that the interpretation of observed magnetic fields is significantly dependent upon instrument accuracy. Such accuracies are responsible for altering the shape of anomalous forms of interpretational considerations. The departures from ideal textbook relationships is commonly quite dramatic. Since the observation of the disturbed geomagnetic field is related to ensemble averages, it is possible to apply methods related to signal theory whereby several interpretational complications may be overcome. The more commonly accepted approach is to use spectral models, (Spector and Grant, 1969). These are concerned with the disentanglement of well-defined local anomalies. It is generally the case that the degeneracies of anomalous forms, as due to instrument accuracy, can be assumed stationary, e.g. instrument sensitivity is seldom expected to change while a survey is in progress.

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An anisotropic spectral analysis has been applied, (Syberg, 1972). The ensemble average model for several orientations has indicated that the maximum depth of detection ranged from 135 to 300 meters below flight elevation. It has further been indicated that the idealized theoretical dipole contributions to the anomalies in the survey area ranged between 1.1 and 12.6 percent.

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The spectral analysis and modelling was used to produce a filter to enhance the attributes to local magnetic anomalies in a manner which optimized interpretability of the causative sources in the geological column. The application of such filters, in addition, generally suppress anomaly contributions due to random events, bird-swing, variations in flight elevation, and other contributions which may interfere with interpretational assessments.

The enhanced isomagnetic contour map due to the above filter application is submitted with report. It can be seen in comparing this map with that of the original survey data that the bias of the Earth's undisturbed geomagnetic field has been removed data adaptively. Also, it is evident that the random attributes due to various causes have been suppressed.

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Several pre-interpretational enhancements were used to investigate the general characteristics of the magnetic anomaly ensemble averages. These include upward continuation, two dimensional Hilbert transforms, envelope functions and special purposes anomaly gradient measures.

It has been noted in areas of steep topographic terrain that the lateral distance between flightlines tended to be tighter than in areas of relative moderate to gentle terrain. Since the survey was flown along flight paths paralleling topographic contours at 100 meter elevation increments it is to be expected that certain elevation controls above topography may play a role in contributing towards anomalous events. The total field magnetic anomalies over terrain surrounding and following rivers and creeks have in general been noted to be characterized by moderate to gentle gradients as compared to those over complicated and steep terrain. There exist most likely two major causes for the broader form of anomalies over creeks and rivers. One, the relative flight elevation above topography in these areas would appear to be above the nominal elevation over steep terrain. It should be noted in this respect that the anomaly due to a specific geological feature is broader and of lower amplitude at a higher elevation than at a lower elevation. Two, non-magnetic unconsolidated materials and overburden usually attain

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greater thicknesses in areas of creeks and rivers and especially where past glaciation through the Indian River valley has cause "back-up" and build-up of glacial till in tributary creeks. It is suspected that this is the case of the reported survey area. The above characteristics, therefore, also contribute towards increased vertical detection ranges, and hence broader anomalous shapes of lower amplitude.

One potential approach towards suppressing the various effects due to complicated topographic relief and highlight the anomalies in especially the near surface geological column is to compute the difference between the enhanced magnetic field and its upward continuation. Upward continuation is a theoretically rigorous computational method for simulating the observed magnetic field as if collected at a greater distance from the causative sources. A number of upward continuation approaches were investigated. The upward distance was between 40 and 100 meters. The contour map of difference as defined above which appear to yield the more believable impression of the near surface geological column, in the views of the writer of this report, has been for an upward distance of 60 meters.

INTERPRETATION

The interpretational results submitted with this report are based principally on the contour maps of the enhanced magnetic field and the differences between the enhanced total magnetic field and its 60 meter upward continuation. The results are illustrated on a geophysical lineament map.

On account of the terrain in the survey area being extremely complicated and locally very steep and, therefore, causing various complications with anomaly disentanglements it has not been possible to examine the anomalies parametrically. After examining various alternatives in determining anomaly centres and model edges it has been implied that a special purpose anomaly gradient measure has provided the more reliable interpretational aid.

It is worthwhile noting that the anomalous effects in the above maps essentially are the near surface contributions to the actual anomalies due to causative sources in the geological column. As stated earlier, with respect to the reported survey this has been the only procedure whereby to highlight anomaly contribution reflecting geology events and suppress those associated with topography and operational difficulties. In reviewing the submitted contour maps it can be seen that the objectives of indirectly attempting to suppress magnetic contributions due to topographic effects and variable flight elevation above topography has been partially accomplished. Generally it would appear that topographic relief in part is related to geological features and events. These relationships may detract from a detailed interpretation of observed magnetic anomalies.

The interpretational map submitted with this report contains the locations of geophysical lineaments deduced from several alternate enhancements of the original magnetic observations. A major lineament, possibly a fault structure, is located centrally in the claim group covered by this report and striking NNWesterly. The general magnetic relief to the west is higher than that to the east of this structure. This may possibly indicate that volcanic sequences of the Gambier group as discussed in submitted geological reports potentially are thicker on the east side of the above structure as compared to the west side of it.

As concerns possible contacts between volcanics of the Gambier Group and quartz diorite intrusions the magnetic observations would not appear to give a clear indication of such with the exception that in the west-central claims area where the above mentioned difference map appears to indicate a contact between Gambier volcanics on the east side and igneous intrusives on the west side of the above mentioned major structure.

Respectfully submitted,

F.J.R. Syberg, Geophys. Candell Consulting Corporation

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CERTIFICATE OF QUALIFICATIONS

I, Fred J.R. Syberg, of the City of Vancouver, in the Province of British Columbia, do hereby validate:

That I am a Consulting Geophysicist associated with Candell Consulting Corporation with offices at 615, 525 Seymour Street, Vancouver, British Columbia.

I further validate:

- That I am a graduate from the University of British Columbia, 1967, and have obtained a B.Sc. degree in geophysics.
- That I have practiced my profession since graduation and that I have been active in the mining industry for the past 27 years.
- 3. That I have no direct or indirect interest in the properties covered by this report nor do I expect to receive any interest therein as a result of writing this report.

The undersigned hereby consents to the use of the report and attached maps in a Prospectus or a Statement of Material Facts.

F.J.R. Syberg, B.Sc. Geophysicist

July, 1983

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APPENDIX A GEOLOGICAL MAP

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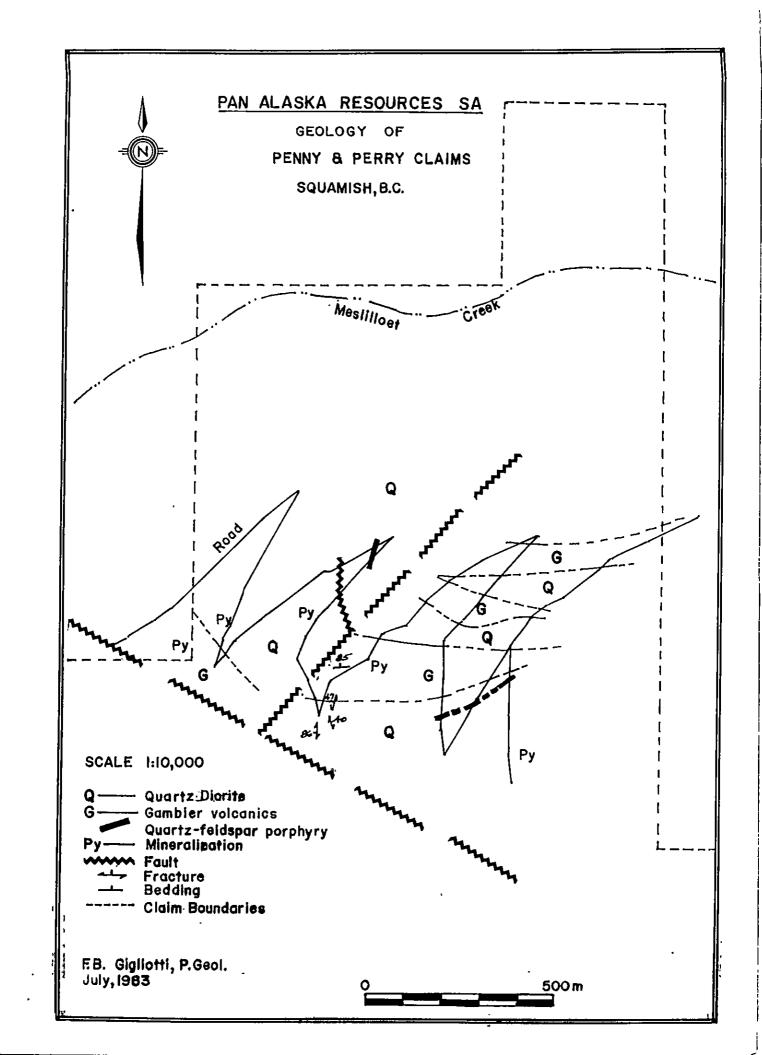
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GEOPHYSICAL MAPS

