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SUMMARY/CONCLUSIONS/RECOMMENDATIONS

Late in February and again in March 1969, 83 line miles of total field aeromagnetic surveying was completed over the Deadwood Camp located immediately west of Greenwood, B.C. The survey was conducted on behalf of a consortium of companies. This report is with particular reference to the property areas held by Silver Dome and Crown Silver Mines Ltd.

The survey was completed in a Cherokee 6-300 fixed wing aircraft equipped with a Varian V4937A proton precession magnetometer (± 1 gamma), SDV4991 digital recorder and analog chart recorders. Flight line positioning was facilitated by 35 mm. strip photography matched to mosaics prepared from Government air photos (see accompanying Figure 4).

Due to local topography, a total of 35 flight lines were contour flown and the flight pattern is quite complex and arcuate. The proton bird terrain clearance averaged 450 feet.

Processing of the data was conducted by personnel and equipment from Geo-X Surveys Ltd., Co-ordinate Aerial Surveys Ltd. and IBM - all of Vancouver, B.C. The accompanying isomagnetic total field plan (see Figure 5) was plotted at a scale of 1":1000' by a computer-plotter unit which contoured at 100 gamma intervals on the west half of the sheet and 25 gamma intervals on the east half.

Deadwood is an historic mining area and part of the famous Boundary Mining Camp which reached a height of activity early in the century with production from dozens of mineral properties. Ore was transported on a network of local railways to any one of three smelters operating at that time. Many of the deposits are replacement skarn type consisting of magnetite, chalcopyrite, pyrrhotite, and pyrite with associated gold values. A typical magnetic target therefore may be expected to be a sharp "thumb print" magnetic spike.

The average total field intensity in the Deadwood area was found to be 58032 gammas and maximum range response was -229 to +952 gammas about this mean. A frequency histogram of 1230 magnetic observations accompanies this report (Figure 3) and shows a positive skewed distribution with a slight departure from log-normality at 58200 gammas.

Two broad magnetic divisions may be distinguished on the isomagnetic plan. The eastern division is a low to moderate total field intensity response area of gentle magnetic relief. The western division is a low to high intensity response area of complex and sharp relief. The division boundary, designated A-A' is not extremely well defined but coincides with a major normal fault zone mapped by Monger (G.S.C. Paper 67-42). The eastern magnetic division, very generally speaking, is underlain by Paleozoic metasediments and volcanics intruded by Mesozoic acidic plutons.

These two widespread rock types in the eastern division do not exhibit large susceptibility contrasts. The western magnetic division of the map sheet is underlain by Tertiary volcanics.

Many magnetic linears are present and form rectilinear patterns in the western and curved patterns in the eastern division. A major magnetic linear trending northwest across the Motherlode - Deadwood Valley (designated B-B') also transects the major subdivision boundary A-A'. The Crown Silver-Silver Dome property is situated in a relatively gentle magnetic response zone. The immediate area is dominated by a through-going magnetic trough and flanked to the east and west by magnetic plateaus. A total of five magnetic highs are present, three to the west and two to the east of the magnetic depression. A general graphic interpretation is displayed in Figure 6.

Investigation as to the cause of the magnetic highs, magnetic linears, and areas characterized by magnetic patterns similar to those over known mineralized areas is recommended.

Respectfully submitted,

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA D. R. COCHRANE

D. R. Cochrane, P. Eng.

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INTRODUCTION

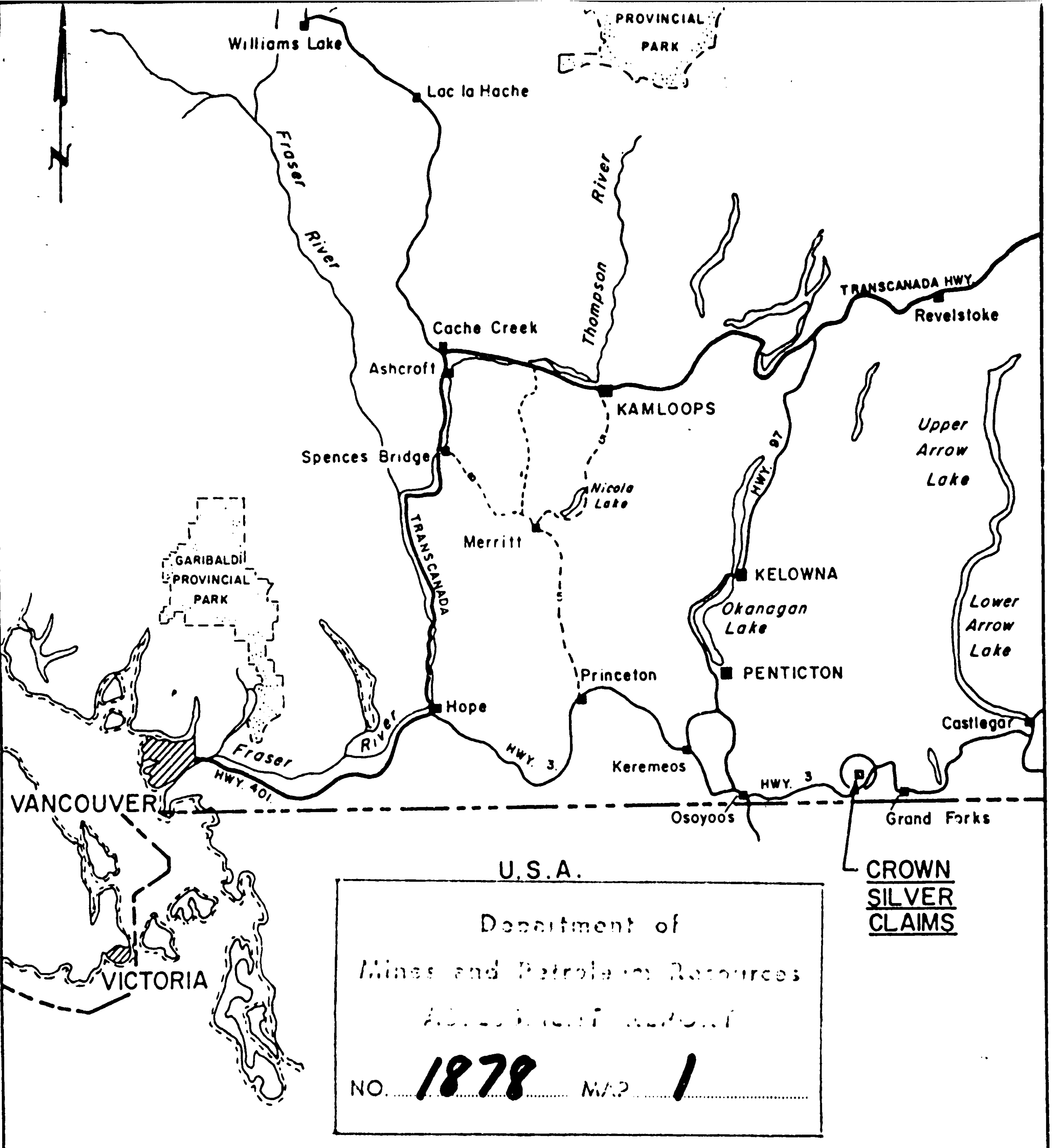
On February 28 and March 29, 1989 a total of 83 line miles of an airborne magnetometer survey was completed over an historic mining area situated immediately west of the city of Greenwood in the Southern Interior of British Columbia and known as the "Deadwood Camp". The survey was conducted on behalf of a number of mining companies that own various claim groups and mineral leases in the area. This report, however, discusses the airborne results with particular reference to the Crown Silver and Silver Dome property. It includes information as to the instrumentation and general field and data processing procedures that were employed on the project.

LOCATION AND ACCESS

The mineral property is centered just over two air miles west of Greenwood in the Boundary area of southern British Columbia. Claims lie between Motherlode and Jolly Jack Creeks and this area is readily accessible by various bush roads. The National Topographic System reference square for the vicinity is 82 E/2. The latitude is 49° 05'N. and longitude 118°45'W.

CLAIMS AND OWNERSHIP

The property consists of located mineral claims and mineral leases situated in the Greenwood Mining Divis...



Department of
Mines and Petroleum Resources
Assessment Report
NO. 1878 MAP 1

0 40 80 120

SCALE : MILES

CROWN SILVER / SILVER DOME MINES LTD.
GREENWOOD AREA-GREENWOOD M.D.
BRITISH COLUMBIA

LOCATION MAP

GEO - X SURVEYS LTD.	DRAWN R.K.	DATED APR. 21/69	FIG. NO. 1
	CHECKED [signature]	JOB NO. 1071	

of B.C. They are held by Crown Silver and Silver Dome Mines Ltd., whose registered office is on the 8th Floor, 1177 West Hastings Street, Vancouver, B.C. The claims are graphically described on Mineral Claims Map 82 E/2 and a copy accompanies this report.

A list of the claims and leases follows:

Recorded Claims	Record Nos.
Little Dallas 1 - 4	21493 - 21496
Copper Coin 1 - 6	21497 - 21502
Lone Star 1 - 2	21503 - 21504
Lone Star No. 3 Fr.	21505
Lone Star No. 4	21506
Lone Star No. 5 Fr.	21507
Lone Star No. 6	21508
Lone Star No. 7 Fr.	21509
Lone Star No. 8	21510
Little Dallas 5 - 7	19255 - 19257
Canada Dry 1 - 8	19247 - 19254
Houston Fr.	19258
Penny 1 - 2 Fr.	21137 - 21138

Leases

127 (Tam O'Shanter)

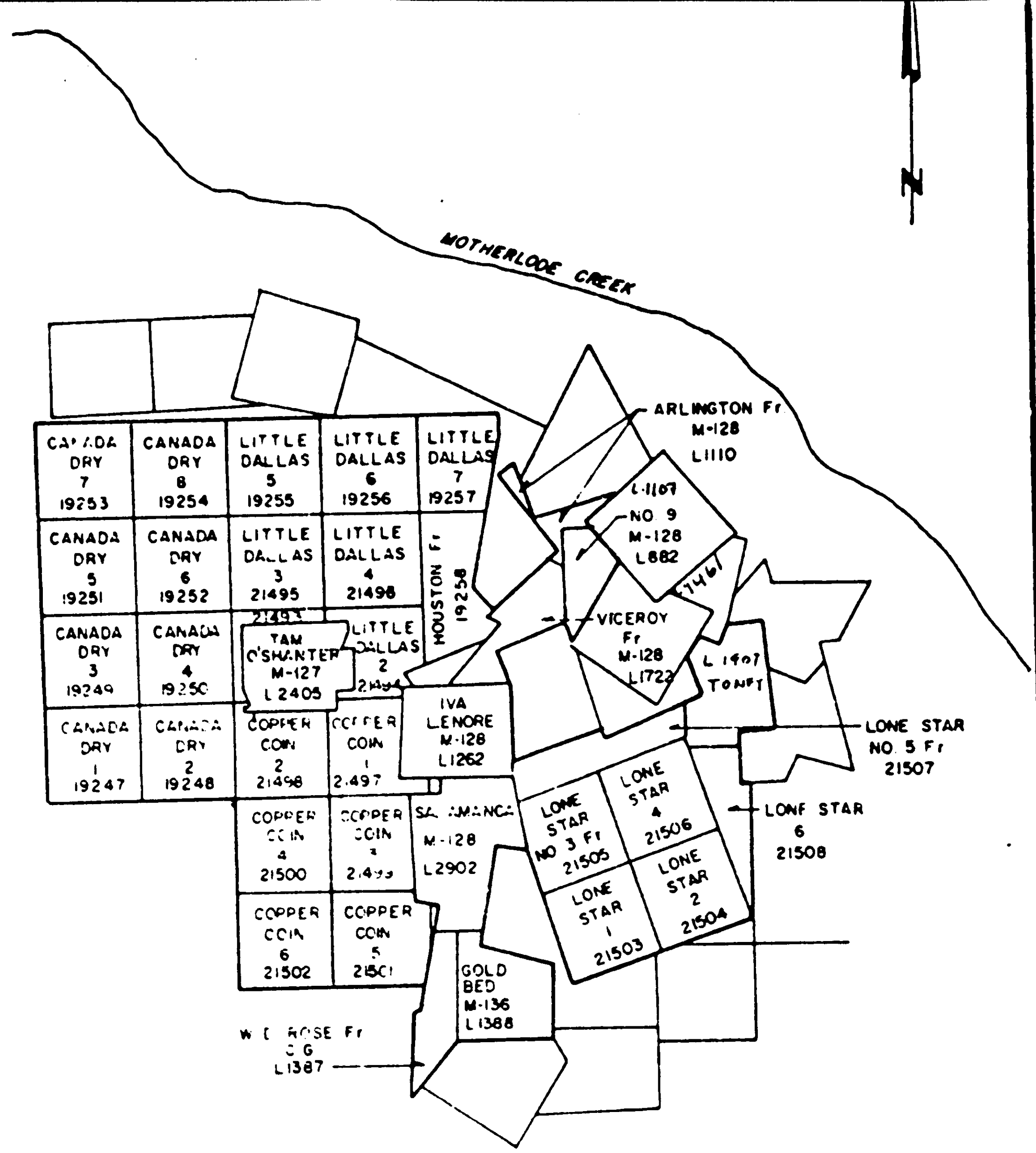
128 (Salamanca, Iva Lenore, Viceroy Fr., No. 9, Arlington Fr.)

136 (Gold Bed)

GENERAL SETTING

The Deadwood area is a part of the famous and historical Boundary Mining Camp, which, early in the 1900's was one of the major copper producing centres in Canada. The mining history of the area dates back to before the turn of the century and coincides with the discovery of placer gold in Boundary Creek about 1892. Mining activity culminated in 1913 at which time 1,250,000 tons of ore were mined and shipped; three copper smelters and many miles of railway line were in operation in the Boundary area.

Physiographically, the Deadwood Camp lies on the east flank of the southern portion of the Midway Range of the Monashee Mountain system of the Interior of British Columbia. It is a transitional area between the relatively gentle rolling surface of the Okanagan Highlands to the west and the rugged mountainous terrain of the Selkirk Ranges to the east. In keeping with its transitional setting, it often displays characteristics of both. Locally, however, it exhibits steep to moderately steep topographic gradients in tributary valleys and in major valleys between the elevation of 2500 feet and 4000 feet (above sea level) and a rather rolling, "domed" surface above this elevation. The majority of the local mountain peaks are less than 5000 feet in elevation above sea level. The Deadwood Camp lies within a "horseshoe shaped" height of land drained to the southeast by the Deadwood and Motherlode (Copper) Creeks. The open



Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO 1878 MAP 2

Copied From B.C Government Claim Map and/or Information Supplied By Client

0 0.5 1.0 1.5
MILES

CROWN SILVER/SILVER DOMES MINES LTD.
GREENWOOD AREA - GREENWOOD M. D.
BRITISH COLUMBIA

CLAIM MAP

Drawn D.E.Y.	Dated APR 21/69	Fig. No. 2
Checked	Job No. 1071	

GEO-X SURVEYS LTD.

end of the horseshoe is near the confluence of the Deadwood and Boundary Creeks at Anaconda (smelter site) just south of the City of Greenwood, at an elevation of 2400 feet. The topographic apex is Copper Mountain, elevation just over 4900 feet, situated some 5½ miles northwest of this point. To the north of the valley is Deadwood Ridge; to the west Ingram Ridge; and to the south and southeast a spur of Ingram Ridge, which in itself, is a spur of Copper Mountain.

J. W. Monger (G.S.C. Paper 67-42) has reported that one of the first geological observations in the map area was by Bauerman (G.S.C. Report Prog. 1882-84 pt. B) who noted the abundance of "porphyritic dykes, greenstones, syenites and elvans" which penetrated slates and greenstones. Basically, his statement remains true to this day. Monger indicates the following:

"Early Tertiary rocks of the Greenwood area consist of a lower sequence of predominantly clastic rocks and a comformable upper sequence of mainly extrusive rocks, the middle part of which is of middle Eocene age. Extensive normal faulting, with fault displacements ranging from a few inches to more than 5,000 feet, generally accompanied by tilting, has affected all of these rocks and they now occur in fault blocks, and in many places are isolated from equivalent rocks by unfaulted older rocks."

He further states:

"The lower sequence, the continental Kettle River Formation (Daly, 1912, p. 394), lies unconformably on a basement composed of late Palaeozoic and early Mesozoic sedimentary, volcanic and generally low-grade metamorphic rocks, intruded by Cretaceous grandodiorite and granite, and consists of a discontinuous basal conglomerate above which are volcanic sandstone and siltstone, acidic pyroclastic rock, acidic lava, shale and relatively minor conglomerate."

Copper-gold mineralization in the Greenwood area is Pre-Cenozoic and often related (spatially at least) to Juro-Cretaceous (Coast Range) intrusives. Much of the ore mined to date has been from replacement (Skarn) type deposits. In many places, the mineralization is conformable to bedding and is most abundant in carbonate rich bands.

AIRBORNE FIELD PROCEDURE

The total intensity of the geomagnetic field was measured and recorded along 35 flight lines, at an average terrain clearance of 450 feet. The flight pattern was complex since the area was contour flown. Flight tracks are graphically displayed on accompanying Figure No. 4.

The survey was conducted in a fixed wing aircraft, towing an airfoil sensor. A proton magnetometer, digital and chart recorders, camera and altimeter were mounted in the aircraft. The magnetometer and chart recorder measured and recorded the magnetic field intensitv. At one second intervals, the field amplitude and fiducial number were recorded on punch tape by the digital recording system. At 30 second intervals, the time and line number were punched on the tape. At two second intervals, a split image camera simultaneously photographed (1) the terrain, and (2), the clock and fiducial display panel. Thus, each terrain photograph is bordered by a photograph of the clock and fiducial number.

The terrain clearance was measured with a Bonzar pulse type radar altimeter and recorded by a V 2000 chart recorder.

Solar flare warnings and predictions, issued daily by the Space Disturbance Forecast Centre in Boulder, Colorado, were used to schedule the flight during a magnetically quiet period.

The punch tape, chart and strip photograph processing is described in the following section. Instrument specifications are in Appendix IV.

DATA PROCESSING

The data processing procedure consisted of four steps, discussed under the following headings:

1. Flight line X-Y positioning.
2. Editing of the paper tape.
3. Tabulation of critical fiducial numbers and their X-Y coordinates.
4. Contour plotting.

I. Flight Line X-Y Positioning:

From the aircraft, while the lines were being flown, the flight lines were roughly positioned on government aerial photographs. In the office, the beginning and end of each flight line was marked on the strip photographs. The strip photos were then sent on to Co-ordinate Aerial Surveys Ltd. of Vancouver, where the flight lines were transferred onto a mosaic prepared from the government photos. Geo-X personnel superimposed an X-Y coordinate system on the flight line mosaic with Y north and X east (see Figure 4). Thus, every position along a flight line was defined in terms of +X (number of feet east of the origin) and +Y (number of feet north of the origin), and has a corresponding magnetic value in gammas.

2. Editing of the Paper Tape:

A listing of the contents of the paper tape was made by IBM of Vancouver. Geo-X personnel examined the listing and compared it with the analog record as a guard against possible machine or operator error. The magnetic readings for areas of flight line intersection were compared as a check on the time variations of the geomagnetic field.

3. Tabulation of Critical Fiducial Numbers:

The first and last fiducial number on each line were tabulated along with their X-Y coordinates. In addition, points where the flight line changed direction were tabulated along with the appropriate fiducial number. The tabulated information was keypunched onto computer cards and sent to IBM.

4. Contour Plotting:

IBM fed the punch tape to a 360/40 computer, along with the X-Y coordinates of the start, end, and any changes of direction that may have occurred in the flight line. The magnetometer readings were evenly spaced along the line segments and contoured by an IBM 1130 with Calcomp drum plotter, at a contour interval of 100 gammas on the western 10,000 feet of the map area, and 25 gammas on the remaining area. The data sampling interval along the flight lines was roughly 160 feet and every other data point was plotted. The final isomagnetic plan was produced by consideration of some 1230 discrete magnetic observations.

RESULTS-DISCUSSION/INTERPRETATION

Introduction

Since ferromagnetic susceptibility and natural rock magnetism change measurably from one rock type to another, accurate detailed mapping of the geomagnetic field often provides valuable information about the sub-surface geology (even in heavily drift covered areas). Aeromagnetic surveys provide new knowledge of the type, general attitude; configuration and complexity of the geo-superstructure and often identifies local elements which sometimes indicate ore. Aeromagnetic prospecting can be applied to the delineation of buried contacts and disruptions, the location of areas of possible plutonic differentiation and its varied products. Considerable speed and accuracy is inherent in this survey. There are, however, often several choices available (especially with particular magnetic effects) during the conversion of these geophysical data into usable geological concepts. This conversion is greatly facilitated, and the ambiguity reduced, in two basic ways. The first is geologic control, which reduces the number of variables that the interpreter must consider. The second is electronic data analysis, which is essentially the use of filtering techniques. Filtering can remove noise, regional variation, and the effects of various physical phenomena (such as some of the effects of topography, or changing depth of burial). This latter method, however, still requires translation into geological concepts. The interpretation of the magnetic data contained herein is a synoptic one and is intended to provide a framework within which a more particular view may be accommodated as (or if) additional geological information becomes available.

Morphological terms have been employed in order to easily discuss and describe the isomagnetic map. Thus the map may be regarded as a contoured magnetic surface or "scape" (terrain) complete with gradients, hills, valleys, ridges and linears. This eliminates the necessity of designing a parallel

A general graphic interpretation accompanies this report and is designated Figure 6. It is basically a "manual" qualitative analysis of the magnetic features rather than a "computational" quantitative one. Considerable reference has been made to the aerial photography, available geology and geophysics in the preparation of the interpretation map.

DISCUSSION/INTERPRETATION

A total intensity isomagnetic field plan is presented as Figure 5. The horizontal scale is 1";1000' (approximately) and is correct to the accuracy of the air-photo mosaic (from which the physiographic features were outlined). Some distortion is inevitable, especially in areas of rugged terrain. The map depicts the intensity of the geomagnetic field present at the given nominal altitude on the particular flight days.

A frequency distribution histogram of 1230 magnetic observations, with class intervals equal to the contour (100 gamma) intervals, is presented as Figure 3. The calculated arithmetic mean is 58032 and standard deviation 170 gammas. This is considered normal for this particular magnetic latitude area. Maximum response was 58985 and minimum 57703 gammas. The histogram shows a very prominent mode lying between 57900 and 58000 gammas and it contains 39% of the total population. Similarly, reference to Figure 5 indicates that the largest section of the area surveyed is characterized by intensities between 57900 and

58000 gammas. The distribution of magnetic values is positively skewed and classically log-normal. Thus, it may be inferred that the magnetic susceptibility of the different rock types is not significantly different and that a small portion of the area surveyed exhibits abnormally high intensities. There is a slight departure from log-normality in class interval No. 6 (58100 to 58200 gammas) and it is a suggestion of inhomogeneity, (i.e. that two magnetic families and therefore two significantly different rock type families are present within the area surveyed). The upper boundary of class interval No. 6, the 58200 contour then, may serve as a rough guide to a geological contact and separating two magnetic families. Based on this contour, and Monger's mapping (see G.S.C. Paper 67-42), the Deadwood Area may be divided into two broad magnetic divisions. The eastern division, east of line A-A' on Figure 6, is characterized by low to moderate total field intensities and a small range of magnetic values. The surface is gentle and only slightly rolling. The western division, west of line A-A' on Figure 6, is characterized by low to high total field intensities and a large range of magnetic values. The surface is relatively rough and complex.

The boundary between these two magnetic divisions is not sharp by all means, but rather gradational from the relatively gentle magnetic relief of the east to the relatively sharp relief of the west.

The boundary A-A' does, however, lie close to the aforementioned 58200 contour interval. Much of the western magnetic division is characterized by intensities in excess of 58200 gammas and the eastern division by intensities less than this value. This line also lies close to a major normal fault zone mapped by Monger which divides the area into two geological families: the eastern area, underlain by Paloezoic metasediments and volcanics intruded by Mesozoic pluton; and the western area underlain predominantly by tertiary volcanics. There is a change in the character of the magnetic response evident between the northern sector of the western magnetic area and the southern. The south sector is a lower amplitude surface and a well developed rectilinear pattern of northwest and northeast trending magnetic linears are apparent. These linears may indicate faults. A rather arcuate pattern of magnetic linears characterizes the eastern magnetic area. The predominant direction is roughly north. A rather unusual linear feature is a northwest by west trending magnetic low axis designated B-B' in Figure 6. It is one of the few trends which transects line A-A' and is common to both magnetic terrains.

The Crown Silver and Silver Dome property lies within a relatively gentle magnetic terrain. One of the most notable features is a north-northwest trending magnetic depression which culminates at the south end of the property in a well developed less than 57800 gamma magnetic low, and at the north end in two smaller sized less than 57800 gamma zones. To the east and west of this magnetic trough, the intensity increases and attains a maximum response of just over 58200 gammas in four well defined areas. These are designated magnetic highs No. 1 through No. 4 inclusive. Three of these are situated to the west of boundary A-A' and one to the east. A fifth magnetic high (un-named) is situated close to the southeast corner of Lone Star No. 2 claim.

A general graphic interpretation accompanies this report and is designated accompanying Figure No. 6.

Respectfully submitted,

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA D. R. COCHRANE

D. R. Cochrane, P. Eng.

James Cerne, M.S.

Glen White, B. Sc.

APPENDIX I

PERSONNEL

NAME: CERNE, James

EDUCATION: B.S. Geology (June 1967)
Case Institute of Technology - Cleveland, Ohio.

M.S. Geophysics (August 1968)
California Institute of Technology - Pasadena, California.

EXPERIENCE: July 1965 - June 1967 - Metallurgy Dept., Case Institute of Technology - Student Asst.

June - September 1967 - N.A.S.A. Manned Spacecraft CNT. Lunar and Earth Sciences Div., Geophysics Group, Houston, Texas.

September 1967 - August 1968 - California Institute of Technology, Seismological Laboratory, Graduate Research Asst.

September 1968 - present. Employed by Geo-X Surveys Ltd. as Geophysicist.

APPENDIX I

PERSONNEL

Name:	WHITE, Glen E.
Education:	B.Sc. Geophysics - Geology University of British Columbia.
Professional Associations:	Associate member of Society of Exploration Geophysicists.
Experience:	Pre-Graduate experience in Geology-Geochemistry-Geophysics with Anaconda American Brass. Since Graduation in 1966 in Geophysics - Geology, has obtained experience in Mining Geophysics with Sulmac Explorations Ltd. Airborne Geophysics with Spartan Air Services consulting on second derivative. Micro-Gravity project with Velocity Surveys Ltd. Recently acted as mining Geophysicist and technical Sales Manager in the Pacific north-west for W.P. McGill and Associates. Presently employed as Airborne and Mining Geophysicist with Geo-X Surveys Ltd. Active experience in all Geologic provinces of Canada has been obtained.