

Bismark

16 p

002284

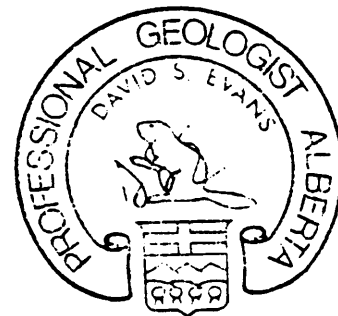
**REPORT ON THE  
BISMARK PROPERTIES  
SLOCAN MINING DIVISION  
BRITISH COLUMBIA**

for

**ST. JAMES'S MINERALS LTD.  
a wholly-owned subsidiary of  
SOURCE RESOURCES LTD.  
715 - 475 Howe Street  
Vancouver, B.C.  
V6C 2B3**

by

**D.S. Evans, Ph.D., P.Geol.  
Consulting Geologist**



**December 31, 1985**

## SUMMARY

The Bismark silver-lead-zinc properties are located 50 kilometres north of Nelson in southeastern British Columbia. Complex vein-breccia-replacement mineralization occurs in a large roof pendant of Slocan Group metasediments within the Nelson Batholith. Past production (1898-1955) from old mining developments along a strike length of 5.2 km has amounted to about 107,000 ounces of silver, 137,800 pounds of lead, 196,000 pounds of zinc. St. James's Minerals Ltd. currently controls 4.7 km of strike extent along the mineralized belt in three non-contiguous claim groups. The average ore previously mined from the company's properties has contained between 50 and 100 oz/ton silver.

Recently defined, geochemical soil anomalies on the company's Bismark-Gold Cure group and Silver Bear group indicate the presence of subcropping silver-lead-zinc mineralization which was not adequately tested in the past. A program of diamond drilling to test anomalies on the Full Rig and Crown Point claims of the Bismark-Gold Cure group is recommended. A program of limited surface surveys to prepare the Silver Bear group anomalies for drill testing is also recommended along with geochemical surveys to be undertaken on the Hartfort group and Bismark group. The total estimated cost of the recommended program is \$80,000.

The Bismark properties of St. James's Minerals Ltd. have good exploration potential for future discovery of several economic zones of high grade silver-lead-zinc mineralization.

## INTRODUCTION

### General

This report has been prepared at the request of Mr. M. Raftery, President of St. James's Minerals Ltd. - a wholly owned subsidiary of Source Resources Ltd. Data compiled in this report has been assembled from government and company reports, from information supplied by the Optionee of the property and from personal observations made during the period 1982-1984 when exploration activities were carried out by a previous operator under the direct supervision of the author.

The author also supervised a program of geophysical and geochemical surveys undertaken on the Silver Bear group of the Bismark Properties by St. James's Minerals Ltd. in October 1985.

This report discusses the current status of the Bismark Properties and the mining history of the immediate area as a basis for continued exploration and development.

### **Location and access**

The Bismark properties are located 12 kilometres west of Kaslo and 50 kilometres north of Nelson in southeastern British Columbia (Figure 1). The properties are centred on latitude 49°50'N and longitude 117°05'W within NTS map area 82F/14. The properties are accessible by paved road from Kaslo to Keen Creek and by gravel road along Keen Creek. A four wheel drive road up Briggs Creek provides access to the Bismark-Gold Cure group. The Hartford group is accessible by trail along Klawala Creek and the Silver Bear group is reached by a four wheel drive road in the vicinity of the Kyawats Creek.

The properties are within an area of rugged mountainous terrain. Topography on the Bismark-Gold Cure group is steep with elevations ranging from 1800 m to 2200 m. Vegetation is sparse and subalpine in nature. The Hartford group is at a lower elevation averaging about 1580 m and has moderate to rolling topography. The Silver Bear group has locally steep topography with an average elevation of 1,350 m. Timber and water are in plentiful supply on both the Hartford and Silver Bear groups.

Supplies and accommodation are available at both Kaslo and Nelson. The Trail Smelter complex is located 60 km south of Nelson to which it is linked by major highways and the Canadian Pacific Railway.

### **Property definition**

The properties subject of this report consist of three non-contiguous claim groupings: The Bismark-Gold Cure group, the Hartford group and the Silver Bear group (Table 1). St. James's Minerals Ltd. (a wholly owned subsidiary of Source Resources Ltd.) has an option agreement to purchase the properties from the owners, Mr. E. Denny and Mr. J. Denny of Nelson, B.C.

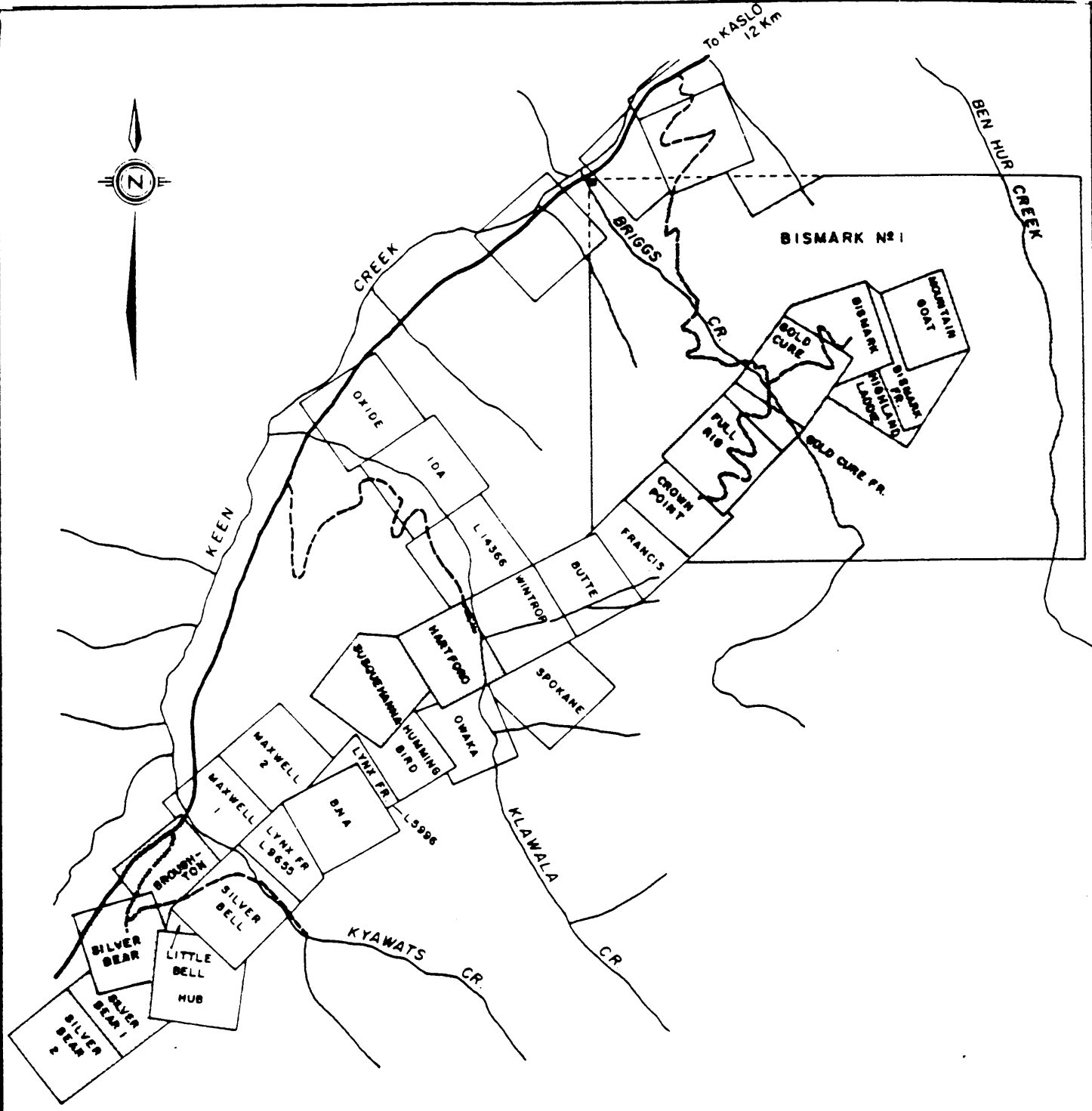
**TABLE 1**  
**Mineral Claims**

| <u>Claim Name</u>              | <u>Type and Record Number</u> | <u>Current Expiry Date</u> |
|--------------------------------|-------------------------------|----------------------------|
| <u>Bismark-Gold Cure Group</u> |                               |                            |
| Bismark                        | Crown Grant (L. 11273)        |                            |
| Highland Laddie                | Crown Grant (L. 11275)        |                            |
| Mountain Goat                  | Crown Grant (L. 11274)        |                            |
| Bismark Fraction               | Reverted Crown Grant (4100)   | September 28, 1989         |
| Gold Cure                      | Reverted Crown Grant (318)    | December 6, 1991           |
| Gold Cure Fraction             | Reverted Crown Grant (319)    | December 6, 1991           |
| Full Rig                       | Reverted Crown Grant (320)    | December 6, 1991           |
| Crown Point                    | Reverted Crown Grant (331)    | January 18, 1991           |
| Bismark #1                     | Located 20 units (1780)       | February 26, 1988          |
| <u>Hartford Group</u>          |                               |                            |
| Hartford                       | Reverted Crown Grant (1159)   | March 2, 1988              |
| Susquehanna                    | Reverted Crown Grant (1160)   | March 2, 1988              |
| <u>Silver Bear</u>             |                               |                            |
| Silver Bear                    | Reverted Crown Grant (585)    | February 3, 1990           |
| Broughton                      | Reverted Crown Grant (586)    | February 3, 1989           |
| Silver Bear #1                 | Located 1 unit (4121)         | October 17, 1987           |
| Silver Bear #2                 | Located 1 unit (4122)         | October 17, 1987           |

Annual taxes have been paid on the Crown Grant holdings and these are currently in good standing.

### **History**

The Bismark properties were originally discovered and worked at the turn of the century for high grade silver ores during the heyday of the Slocan Mining Camp. Intermittent exploration, development and production took place at various locations on the property since that time, notably in the 1920's and 1950's. The properties subject of this report are part of a complex vein/replacement system which extends over a strike length of approximately 5.2 km (Figure 3). St. James's Minerals Ltd. currently controls 3.4 km of this strike length and also controls a further 1.3 km of prospective strike length at the northeast end.



DSE

**ST. JAMES'S MINERALS LTD.**

**BISMARCK PROPERTIES**

SLOCAN M.D.-B.C. NTS:82-F-14

**CLAIM MAP**

DEC., 1985

FIGURE 12



The Bismark claim was developed during the period 1898-1910 by three adits over a vertical distance of 106 metres. The majority of production during this time came from a chimney shaped, high grade ore shoot approximately 9 metres long and varying from 0.6 m to 1.2 m in width. The ore shoot was apparently mined out between the upper two levels over a vertical distance of 34 m. The ore shoot persisted at depth to the lowest level for an additional 72 m and some ore was produced below the intermediate level. Production records indicate that during this time, 957 tons were shipped at an average recovered grade of 83 oz/t silver and 5% lead. Cairnes (1935) reports that the vein on the lowest level had been traced along a strike length of 91 m, over a thickness averaging 1.0 m. Cairnes also reports a sample taken across 15 cm of heavy sulphide material (on this level) returned an assay of 196.3 oz/t Ag, 26.8% Pb and 38.4% Zn. Clearly, the Bismark vein system contained more lead and zinc values than the old production records indicate. There is no evidence to suggest that the vein system does not persist below the lowest adit level.

At about the same time that the Bismark development was occurring, a considerable degree of activity took place on the contiguous Gold Cure, Full Rig and Crown Point claims. Five adits and six small open cuts are present on this group of claims but records of the timing and extent of this work are incomplete. Cairnes (1935) reports that a shipment of 20 tons in 1909 from this group of claims averaged about 100 oz/t Ag and 50% Pb. Minor rehabilitation work was undertaken in 1950-51 by Red Hawk Gold Mines Ltd. but no details of this are available.

The Gibson (Daybreak) property consists of the Francis, Butte and Wintrop claims located contiguous with and between the Gold Cure group and Hartford group of St. James's Minerals Ltd. Starck and Hill (1965) report the presence of six adits exploring two mineralized "lodes" on this property. Past production from the property amounts to 676 tons with a recovered grade of 17 oz/t Ag, 16% Pb and 8% Zn.

Previous development of the Hartford group consisted of two adits, which are now completely caved, exploring silver bearing galena-sphalerite-pyrite replacements in silicified shear zones in limestone. No additional information is available on these workings.

Development work on the Silver Bear group occurred somewhat later than work on the other properties in the area. Between 1919 and 1932 the property was developed by six adits, three intermediate levels and several open cuts. Most of this work was concentrated along a strike length of 150 m and three adits developed two mineralized lodes over a vertical depth of 104 m. The main adit was driven over

220 m from the elevation of Keen Creek. Between 1951 - 1955 the old workings were rehabilitated and some production took place from intermediate levels. Production records in the Annual Report Index of the B.C. Minister of Mines show a total production from 1919 - 1952 of 500 tons with a recovered grade of 50 oz/t Ag, 2.1% Pb and 1.8% Zn

Records from the Silver Bell claim (contiguous with the Silver Bear group but not controlled by St. James's Minerals Ltd.) indicate a total production of 507 tons at an average recovered grade of 156 oz/t Ag and 19% Pb in the period 1898-1925.

There is no evidence of any significant exploration activity on the Bismark properties controlled by St. James's Minerals Ltd. in the period between the mid-1950's and 1980. In 1980 systematic geochemical and geophysical exploration was initiated by Jack and Eric Denny. This work was expanded under the author's supervision by Greenwich Resources Inc. in 1982-1984 at an approximate cost of \$70,000, and by St. James's Minerals Ltd. in 1985 at an approximate cost of \$10,000. The results of this recent work will be discussed in a subsequent section of this report.

## References

1. Cairnes, C.E., 1934: Slocan Mining Camp, British Columbia, GSC Memoir 173.
2. Cairnes, C.E., 1935: Descriptions of Properties, Slocan Mining Camp, British Columbia; G.S.C. Memoir 184.
3. Evans, D.S., 1982: Bismark Property, Preliminary Evaluations, unpublished report. For Greenwich Resources Inc.
4. Sinden, G.W. and Evans, D.S., 1984a: Prospecting Report, Silver Bear Claims, Slocan Mining Division. For Greenwich Resources Inc.
5. Konkin, K. and Evans, D.S., 1984: Geological assessment report, Bismark - Gold Cure Claims, Slocan Mining Division. For Greenwich Resources Inc.
6. Sinden, G.W. and Evans, D.S., 1984b: Prospecting Report, Hartford - Susquehanna, Slocan Mining Division, NTS 82 F/14. For Greenwich Resources Inc.

7. Evans, D.S., 1985: Reconnaissance Geochemical and Geophysical Surveys, Silver Bear Claims, Slocan Mining Division, NTS 82 F/14. For St. James's Minerals Ltd.
8. Little, H.W., 1960: Nelson Map-Area, West Half, British Columbia (82F W1/2), GSC Memoir 308.
9. Starck, L.P. and Hill, H.L., 1965: Report on Daybreak Mining Corporation (1957) Ltd., Ainsworth Mining Division, Kaslo, B.C. For Daybreak Mining Corporation (1957) Ltd.

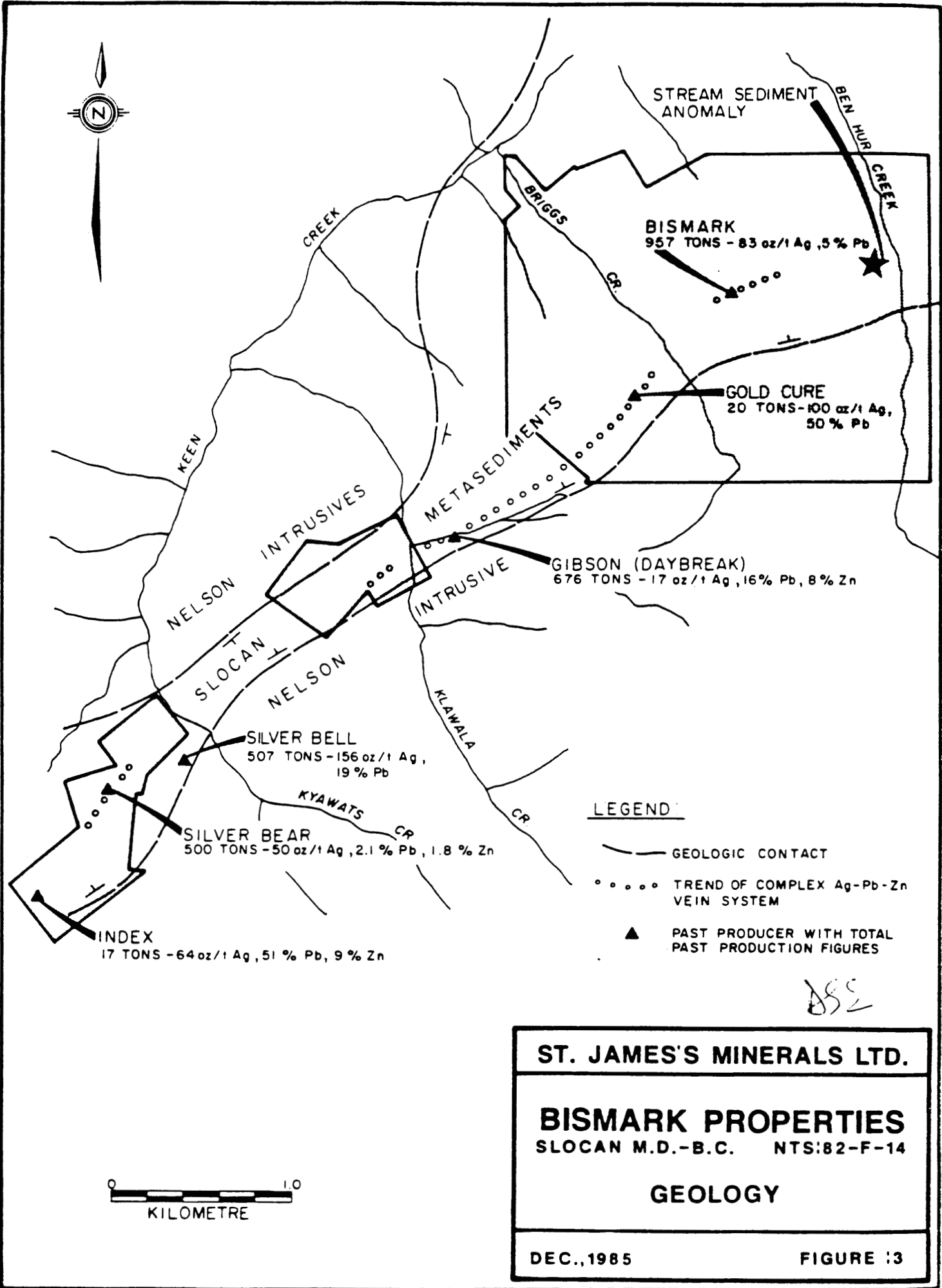
## GEOLOGY

The Bismark properties are underlain by Triassic Slocan Group sedimentary and metasedimentary rocks. These rocks have been folded into a steeply dipping synclinal wedge bounded on the north and south by Nelson Plutonic Intrusive rocks. Faulting, shearing and metasomatism accompanied intrusive activities and are directly related to the formation of vein and replacement deposits of lead-zinc-silver and cadmium.

The Slocan Group consists primarily of argillites, limestones, quartzites and minor schists. Sedimentary strata generally strike N50W and dip N70W, but local variations are not uncommon. Argillites are fine-grained and thinly bedded silty and sandy units, well-indurated and have a slaty cleavage. Carbonate content increases at or near the contact with limestone units. Iron oxide staining is common in some areas and minor limestone concretions and inclusions are prevalent. Limestone units are normally fine-grained rocks, grey on weathered surfaces, white on fresh surfaces and may host iron oxide stained pods of argillite. Quartzites are normally grey, fine-grained, well-indurated rocks that are rarely found in areas of sulphide mineralization. Schistose phyllites are found throughout the Bismark Properties and may be of significance in locating new mineral deposits. Old literature often cites the presence of a "crushed zone" within argillite units where silver-bearing mineralization was present and may reflect on faulting and shearing events. The schistose phyllite is considered a metasomatized or metamorphosed argillite and may contain minor amounts of andalusite schist.

Nelson Plutonic Rocks are Cretaceous granitic intrusives which underlay and flank Slocan Group rocks to the east, west and south of the Bismark Properties. The Bismark-Gold Cure group is located just to the north of a major batholithic complex of





DSE

**ST. JAMES'S MINERALS LTD.**

**BISMARK PROPERTIES**  
SLOCAN M.D.-B.C. NTS:82-F-14

**GEOLOGY**

DEC., 1985 FIGURE :3

pink, leucocratic, porphyritic and non-porphyritic granites and granodiorites. The Silver Bear and Hartford Groups are located within Slocan Group rocks near the southwest margin of the contact with the granite batholith. Dykes of aplitic and granitic composition intrude and intersect the Slocan Group on the Bismark Properties. Field relationships are unclear; but, it is assumed that these intrusive units are "late stage" events that have little or no bearing on the emplacement of silver-bearing sulphide mineralization.

Dark Lamprophyre dykes are in evidence on the Bismark Properties, primarily exposed on the Bismark-Gold Cure Group. On exposure, this unit weathers into loose, coarse granular products. The dykes are of mafic to ultramafic composition containing hornblende, biotite and pyroxene and may be associated with the Nelson Intrusive events.

### MINERALIZATION

In the area of the Bismark Properties, the Slocan Group has been folded into a synclinal roof pendant body of metamorphosed, metasomatized, faulted and sheared rocks. It appears that many of the sulphide-bearing mineral deposits are located at or near the axial plane of the syncline. A composite vein system (Cairnes, 1935) has been identified, extending from the Bismark workings through the Gold Cure occurrences, the Daybreak Mine, the Silver Bell prospects, the Silver Bear deposits and the Index occurrences, a length of approximately 5.2 km.

Silver-lead-zinc bearing sulphide mineralization occurs as replacements of limestones, as brecciated quartz-carbonate veins and as replacements in shear zones cutting argillites. The composite sulphide veins are closely related to the contact between limestone and argillite/slate. Sulphide minerals present include sphalerite, galena, pyrite, tetrahedrite, chalcopyrite, pyrrhotite and friebertite. The major gangue minerals are quartz, calcite and siderite. A substantial portion of previous production contained heavily oxidized material resulting from the relatively open nature of the vein systems.

Mineralization on the Bismark claim is best described by Cairnes (1935).

"Early reports and mine maps indicate that a shoot of oxidized lead ore, some 30 feet long, exposed at the surface and encountered near the portal of the uppermost (No. 1) adit, persisted in chimney-shaped form to No. 2 level 112 feet below No. 1; that what was probably an extension of the

same shoot was encountered near the face of No. 3 level, at an additional depth of 238 feet; and that at this lowest level the vein matter had a width of 2 feet. A crosscut 135 feet from the portal (over 300 feet from the face) had also exposed the lode across a width of 3 feet. A sample taken by Mr. Garde across a width of 6 inches of heavy-sulphide ore in two cuts (top and bottom) gave 38.4 percent zinc, 26.8 percent lead, and 196.3 ounces silver to the ton. Subsequent work, including a shaft and upraise at this point, have shown continuous mineralization across a width of as much as several feet.

At the surface the lode is 3 or 4 feet wide and is of calcite with bunches of galena, a little quartz, and pyrite, and considerable oxidized material. Above No. 2 level ore has been stoped to the outcrop above the portal of No. 1 adit. The ore-bodies have formed partly by replacement of one or more limestone beds outcropping in the vicinity of the workings."

There are no available descriptions of the mineralization encountered in several adits on the Gold Cure, Full Rig and Crown Point claims. The general nature of waste material on the adit dumps is similar to such material on the Bismark dumps. Seventeen composite grab samples taken from dumps on the Gold Cure, Full Rig and Crown Point claims returned arithmetic average assay values of 14.3 oz/t Ag, 2.9% Pb and 1.7% Zn. It has already been noted that a 20 ton ore shipment from this group of claims returned about 100 oz/ton Ag and 50% Pb.

At the Gibson (Daybreak) property two parallel mineralized veins approximately 90 m apart occur within sheared and brecciated zones averaging 1.5 m in width. The veins are conformable with host rock stratigraphy and were drifted on for about 250 metres of strike length. Minister of Mines (1926) reports a grab sample from sacked ore assayed 36.9 oz/t Ag, 50.6% Pb, 13.4% Zn. Production records credit the Daybreak with 676 tons with a recovered grade of 17 oz/t Ag, 16% Pb and 8% Zn. Starck and Hill (1965) calculated a mineral reserve of 9700 tons grading 6.1 oz/t Ag, 6.0% Pb, and 8.3% Zn.

Mineralization from two dumps on the Hartford group consists of galena, sphalerite, and pyrite occurring as irregular replacements in silicified shear zones within altered limestones. The old workings are totally sloughed in, the group has very poor outcrop and there are no available reports on the underground workings. A single dump grab sample taken by the author in 1982 assayed 29.3 oz/t Ag, 0.75% Pb and 0.53% Zn.

Extensive underground workings are present in the northeast part of the Silver Bear claim. The two principle veins have a northeasterly strike and dip 65° southeast.

The veins are parallel zones of strong shearing up to a few metres wide and are separated by 25 m of massive rock. They have been explored over a strike length of about 300 m and to a depth of about 100 m. Galena, sphalerite and pyrite are reported to occur in a gangue of broken quartz, calcite, siderite and crushed rock. The Minister of Mines report for 1924 indicated that one small ore shoot produced five car loads which averaged 163 oz/t Ag, 8% Pb and 12% Zn. Production records indicate that the Silver Bear produced a total of 500 tons of ore at an average recovered grade of 50 oz/t Ag, 2% Pb and 1% Zn between 1898 and 1925. Two composite grab samples taken from dumps on the claim by the author in 1982 returned an average assay of 88.7 oz/t Ag, 0.7% Pb and 9.3% Zn.

### GEOCHEMISTRY

Systematic soil sampling was undertaken on the Full Rig and Crown Point claims (part of the Gold Cure group) in 1982 and 1983 by Greenwich Resources Inc. under the direct supervision of the current author. Soil geochemistry proved to be an effective exploration aid and identified two parallel anomalous trends which define the apparent trend of near-surface sulphide mineralization evidenced by old adit sites (Figure 4). Anomalous threshold values determined from 274 samples are 2.4 ppm Ag, 80 ppm Pb, and 180 ppm Zn. Strongly anomalous silver and lead values occur along a strike length of 420 metres paralleling but not exactly coinciding with the old workings. A series of high silver values (up to 98.6 ppm Ag) across a width of 20 metres, close to the ridge crest on the Crown Point claim, provide a good initial drill target.

A grid soil sampling program covering the complete Silver Bear group was undertaken by St. James's Minerals Ltd. in 1985 under the author's supervision. A broad area 800 m long and 3-400 m wide covering the Silver Bear & Broughton claims is outlined by weakly anomalous silver values greater than 2 ppm. Within this area 3 and perhaps 4 linear trends occur with silver values greater than 3 ppm and up to 20 ppm, lead values greater than 80 ppm and zinc values greater than 500 ppm (Figure 5). It is probable that some of these trends coincide with mineralization explored by the old timers but the lateral extent of soil anomalies is far greater than that of the old workings. It is anticipated that limited additional surface work correlating known mineralized veins with soil geochemical responses will result in definition of several new drill targets on the Silver Bear group.

At the opposite end of the mineralized trend - NE of the Bismark claim -several reconnaissance silt samples were taken from Ben Hur Creek in 1983. One of these

samples - taken from a small tributary creek directly in line with the projected strike of the Bismark vein zone - returned a highly anomalous value of 37.2 ppm Ag. The anomaly was confirmed by resampling. A line of soil samples taken upslope from the silt anomaly did not return any anomalous values but the sample spacing was so wide that a relatively narrow vein structure could have been easily missed. The evidence suggests that there is excellent opportunity here, through additional surface work to discover extensions of the Bismark mineralization.

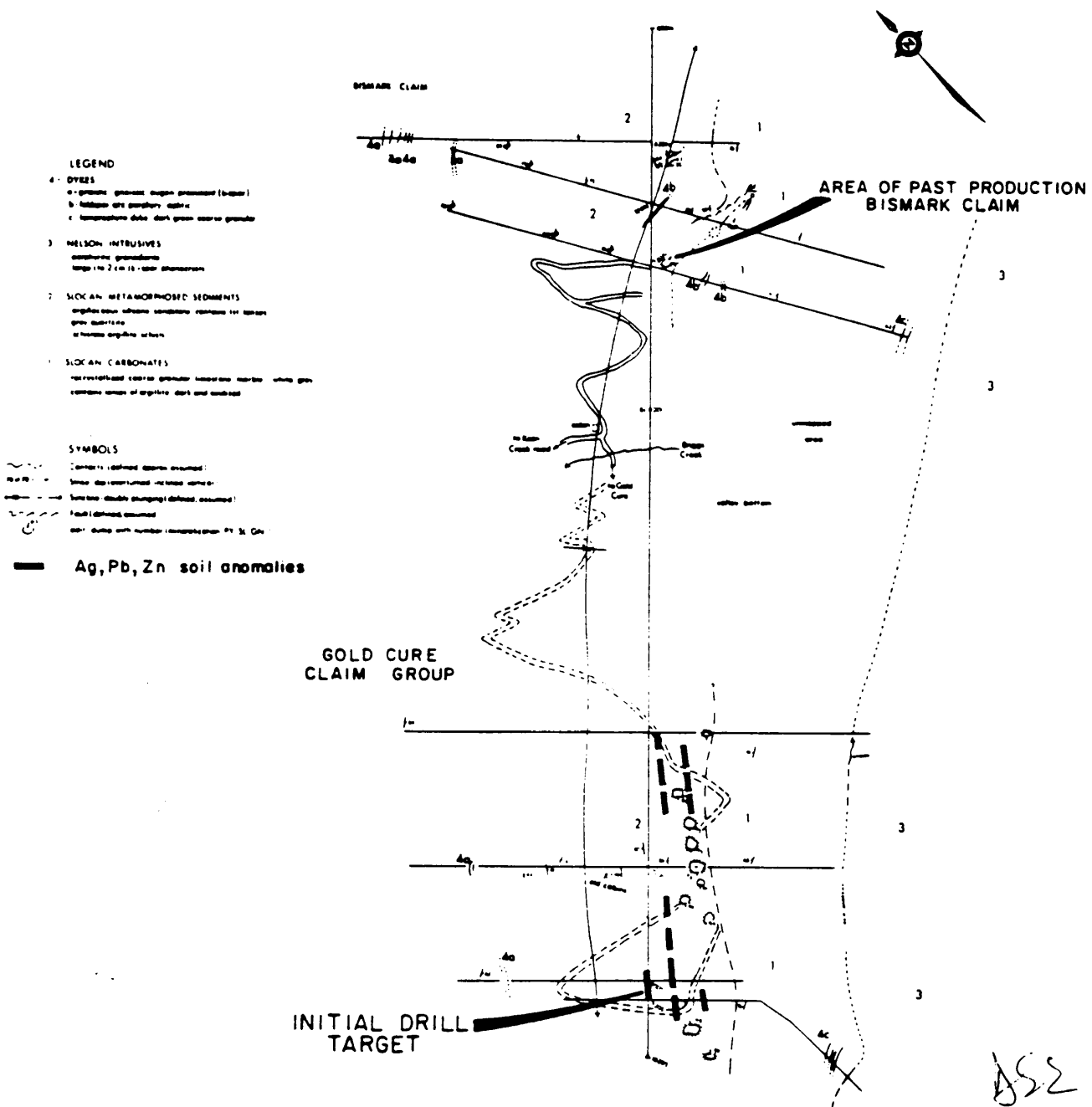
### GEOPHYSICS

VLF-EM geophysical surveys were undertaken on the Gold Cure group in 1983 and on the Silver Bear group in 1985. Survey results were somewhat erratic and failed to provide evidence of any definite continuous zone of response related to mineralization. Strong field effects from marked lithological contrasts and complex structural zones may be masking the responses from sulphide mineralization. VLF-EM responses for a reconnaissance line over the Bismark lode zone were also diffuse.

### CONCLUSIONS

The Bismark properties are part of a complex silver-lead-zinc bearing vein/replacement lode system which extends over a strike length of approximately 5.2 km. St. James's Minerals Ltd. currently controls 3.4 km of this strike length and a further 1.3 km of prospective strike length of the northeastern end of the trend. Past production from various locations along the length of this mineralized system indicates that steeply plunging, high grade mineralized shoots are present, grading in excess of 100 oz/ton silver. Production records and recent dump sampling suggest that high grade silver values may not necessarily be associated with visible high grade lead and zinc sulphide mineralization. It is quite possible that several zones of higher grade silver mineralization were neither discovered nor developed by previous activity on the properties. The recently defined zones of soil geochemical anomalies on the Gold Cure group and Silver Bear group warrant careful testing by diamond drilling - an exploration technique that has apparently not been used on these properties to date. Further surface exploration northeast of the Bismark claim is warranted, to identify the source of a high silver anomaly in stream sediment.

The Bismark properties have good exploration potential for future discovery of several economic zones of high grade silver-lead-zinc mineralization.



**ST. JAMES'S MINERALS LTD.**

**BISMARCK-GOLD CURE GROUP**

**SLOCAN M.D.-B.C. NTS:82-F-14**

**GENERAL GEOLOGY MAP**

**DEC., 1985** **FIGURE :4**



SILVER BEAR  
PAST PRODUCTION  
500 TONS - 50 oz/1 Ag, 2.1% Pb, 1.8% Zn

ADITS

NEW TARGET

ROAD

TO KEEN CR  
ROAD

NEW TARGET

ROAD

ADITS

INDEX  
PAST PRODUCTION  
17 TONS - 64 oz/1 Ag, .51% Pb, 9% Zn

LEGEND

 SOIL ANOMALIES

*JSS*

0 100 200  
METRES

**ST. JAMES'S MINERALS LTD.**

**BISMARCK PROPERTIES**

SLOCAN M.D.-B.C. NTS:82-F-14

**SILVER BEAR GROUP**

DEC., 1985

FIGURE : 5

## RECOMMENDATIONS

Exploration success on the Bismark properties can only be demonstrated effectively by diamond drilling. Drill targets are established on the Gold Cure group and are close to being established on the Silver Bear group.

It is recommended that a program of 500 metres of diamond drilling be undertaken as an initial test of targets on the Gold Cure group. This program will require preliminary upgrading and extension of existing road access which could be combined with limited trenching activity, dependent upon topographic conditions.

It is also recommended that a grid soil geochemical survey be undertaken on the Hartford and Susquehana claims combined with geological mapping; that geochemical, prospecting and geological surveys be undertaken northeast of the Bismark claim and that surface surveys be undertaken on the Silver Bear group to establish the relative positions of geochemical anomalies and previous mineral development.

It is estimated that the cost of the above recommended program will be approximately \$80,000. Additional programs may be recommended contingent upon successful results.

December 31, 1985  
Calgary, Alberta

