

**GEOLOGICAL  
ASSESSMENT REPORT  
STIBNITE CLAIM GROUP  
KAMLOOPS MINING DIVISION**

**August 1, 1996**

**M.S. Morrison, B.Sc.**

24502

**GEOLOGICAL**  
**ASSESSMENT REPORT**

on the

**STIBNITE CLAIM GROUP**  
**KAMLOOPS LAKE AREA**

by

MURRAY S. MORRISON, B.Sc.

GEOLOGICAL SURVEY BRANCH  
ASSESSMENT REPORTS

DATE RECEIVED  
AUG 08 1996

**CLAIMS:**

Stibnite 1 & 2, 2-post mineral claims (2 units)

**LOCATION:**

The Stibnite Claim Group is situated at Pat Lake, 2 km south of  
Kamloops Lake, 35 km west of Kamloops, B.C.

Lat. 50°44'; Long. 120°44';

N.T.S. Maps: 92-I-10E & W

**OWNER:**

M. S. Morrison

**OPERATOR:**

M. S. Morrison

**DATE STARTED:**

April 29, 1996

**DATE COMPLETED:**

May 1, 1996

**GEOLOGICAL SURVEY BRANCH**  
**ASSESSMENT REPORT**

Kelowna, B.C.

24,502

August 1, 1996

FILMED

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## SUMMARY

The Stibnite Claim Group, located at Pat Lake 2 km south of Kamloops Lake, 35 km west of Kamloops, B.C., hosts at least two antimony-bearing silica replacement zones in Upper Triassic Nicola Group metasediments. The replacement zones are thought to represent the upper (low temperature) horizons of fault-controlled epithermal systems that could contain precious metal values at depth.

The Stibnite Claim Group is comprised of 2, 2-post mineral claim that were staked by the writer in 1995.

The ground cover by the present mineral claims has been the target of sporadic exploration (geological, geochemical and magnetometer surveys) dating back to 1982 when it was covered by the Sprout 3 mineral claim owned by Newmont Exploration of Canada Ltd. One old stibnite showing (the Pat Lake Showing in this report) was "rediscovered" by Newmont in 1982. A second stibnite showing, located 500 metres west of the Pat Lake occurrence, was discovered by the writer in 1989, and it is now located on the Stibnite 1 Mineral Claim.

The style of mineralization at both prospects is similar with blebs and smears of stibnite occurring in highly silicified metasediments. The concentration of stibnite at the Pat Lake Showing is greater (1-5%) than that at the 1989 discovery (1-2%). Samples from both sites yield low gold assays.

The Stibnite 1 mineral claim stibnite occurrence was the focus of this year's geological mapping program, and like so many other prospects in the Savona district, the silica replacement zone is surrounded by weak carbonate replacement. The replacement zone appears to be related to high-level intrusives that are fault controlled.

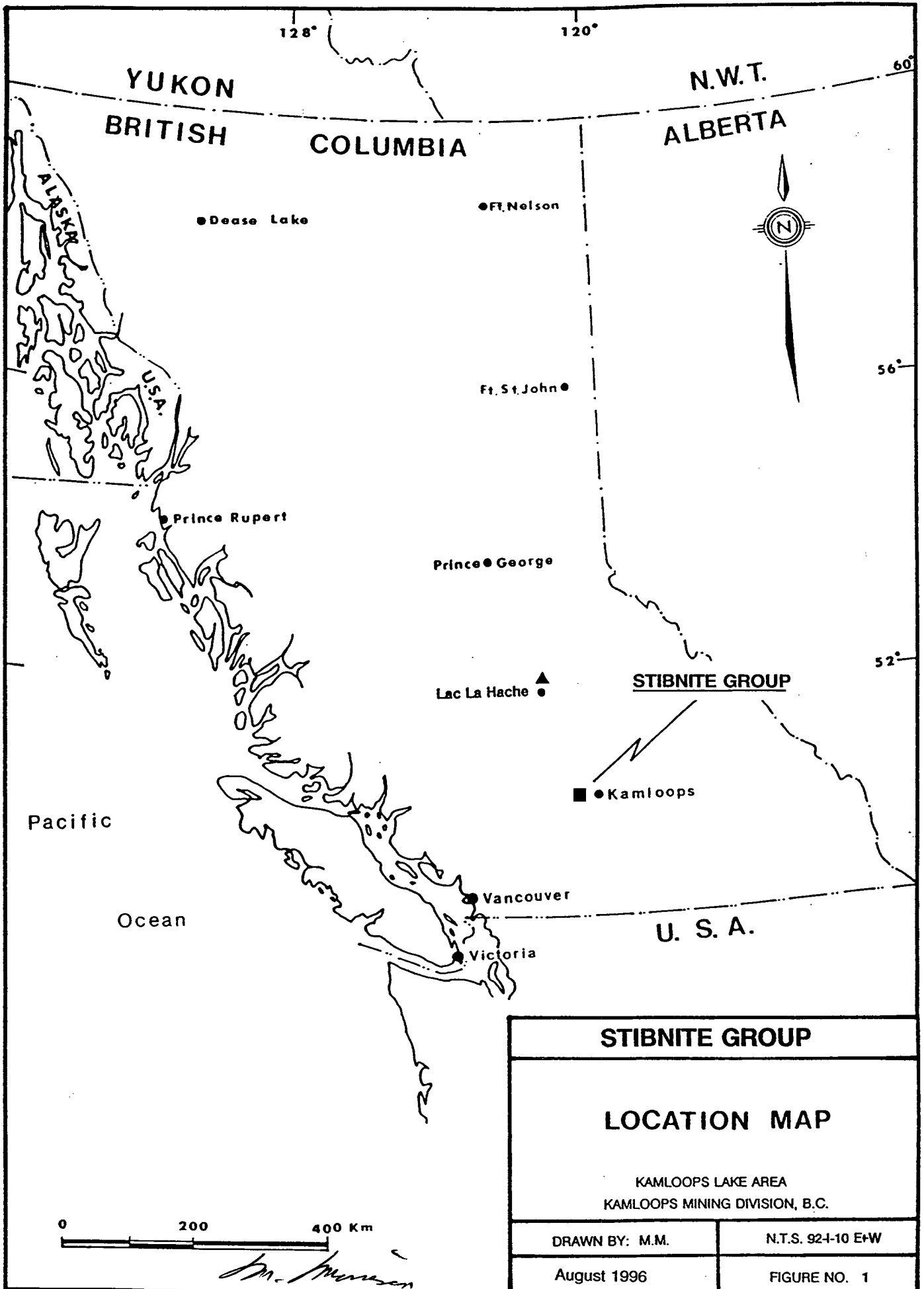
SUMMARY continued

The Newmont Showing, located 2.5 km southeast of the Stibnite Claim Group demonstrates that significant gold (3.2 g/tonne) and silver (180 g/tonne) values do occur within silica replacement zones in the Savona district.

As stated in the introductory paragraph, it is thought that the stibnite-bearing silicified replacement zone on the Stibnite 1 mineral claim could represent the upper horizon of an epithermal system that could host precious metals at some shallow depth.

A trenching program is recommended to better expose the Stibnite 1 mineral claim stibnite prospect, and an expanded trenching program or percussion drilling program is recommended to test bedrock along a northeast fault (inferred) that crosses the Stibnite 1 mineral claim immediately to the east of the stibnite prospect.

It is recommended that the samples collected be analyzed for the standard 30 ICP elements plus gold by Atomic Absorption.



Pacific

Ocean

0                      200                      400 Km

*M. Morrison*

### STIBNITE GROUP

### LOCATION MAP

KAMLOOPS LAKE AREA  
KAMLOOPS MINING DIVISION, B.C.

DRAWN BY: M.M.

N.T.S. 92-1-10 E+W

August 1996

FIGURE NO. 1

## INTRODUCTION

This report, written for government assessment work requirements, discusses the results of a geological mapping program conducted over the southwestern corner of the Stibnite 1 mineral claim by the writer during April-May, 1996.

The Stibnite 1 & 2, 2-post mineral claims make up the Stibnite Claim Group which is situated on the south side of Pat Lake, 2 km south of Kamloops Lake, 35 km west of Kamloops, B.C.

The Stibnite Claim Group was staked by the writer, M. Morrison, of Kelowna, B.C. in May 1995 to cover two stibnite prospects that occur with small carbonate/silica replacement zones within volcanic derived metasediments of the Upper Triassic Nicola Group. Similar carbonate/silica replacement zones carrying values in mercury, gold, silver, and antimony occur within a belt of the Nicola Group that extends up to 25 km north and south of Savona at the western end of Kamloops Lake.

It is thought that the stibnite occurrences on the Stibnite Claim Group, like other stibnite (antimony) and cinnabar (mercury) prospects in the district, may represent the upper (low temperature) minerals of epithermal systems that could host precious metals at depth.

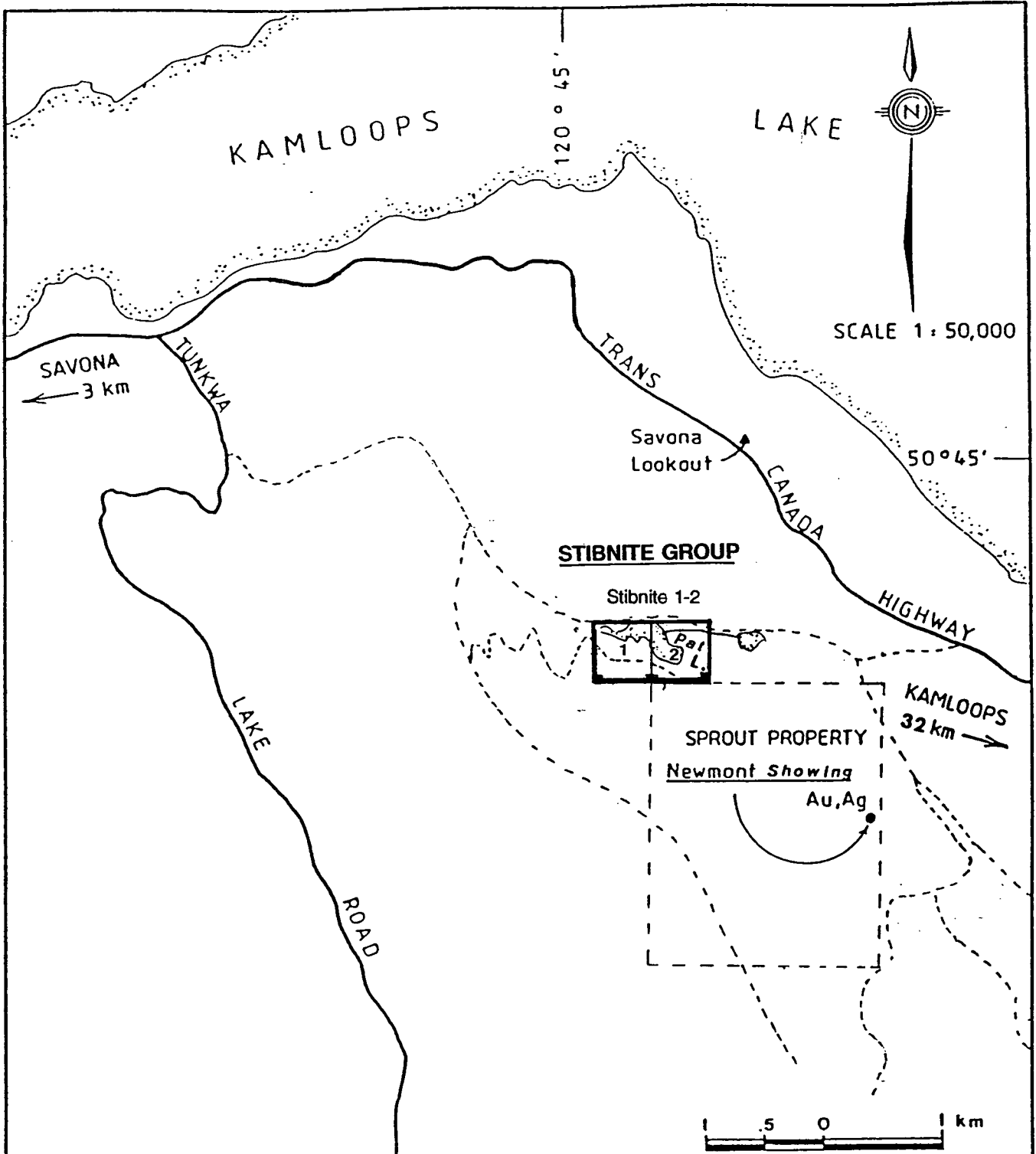
The two stibnite occurrences on the Stibnite property are very poorly exposed and it was hoped that this year's mapping program might identify some of the geological factors involved in the emplacement of the zones. It was thought that a better understanding of the geology would aid in the appraisal and development of the prospects.

The geology of the southwest corner of the Stibnite 1 mineral claim is illustrated on Figure 4 accompanying this report.

**LOCATION AND ACCESS**

The Stibnite Claim Group is located on the south side of Pat Lake (locally called Six Mile Lake) 2 km south of Kamloops Lake, or 35 km west of Kamloops, B.C. (Lat. 50°44'; Long. 120°44'; N.T.S. Map 92-I-10E & W). Access to the property is via the Pat Lake Road which leaves the Trans Canada Highway 32 km west of Kamloops, or alternately from Savona, 6 km, via the access roads illustrated on Figure 2.





### CLAIMS and ACCESS

### STIBNITE GROUP

Kamloops Lake Area  
Kamloops Mining Division, B.C.

Drawn by M.M.

N.T.S. 92-1-10 E,W

August 1996

Figure No. 2

## PHYSICAL FEATURES AND CLIMATE

The Stibnite property overlies the southern half of a shallow east-west valley in which Pat Lake is situated. The valley, at the 600 metre elevation, lies just 2 km south of Kamloops Lake (350 metre elevation).

A light forest of Ponderosa pine and Douglas fir covers the slopes of the main valley, while sagebrush is predominant on the low ridges and hummocks that surround Pat Lake.

Some of the low ridges expose bedrock, while others are believed to be comprised entirely of glacial drift. Some of the smaller valleys are also believed to be partially filled with drift.

The property falls within the desert climate typical of the countryside at the lower elevations surrounding Kamloops Lake. Precipitation equals less than 30 cm annually and includes an average winter snow pack of 20 cm. The snow-cover generally lasts only from late November until early March.

**CLAIM STATUS**

The Stibnite 1 & 2, 2-post mineral claims were staked by the writer, M. Morrison, of Kelowna, B.C. on May 8, 1995. The two mineral claims, lying within the Kamloops Mining Division, were given Tenure Numbers 335440 & 335441. The new Expiry Date for the two mineral claims is May 8, 1999 (based on the acceptance of this report for Assessment Work Credits).

## HISTORY

The Stibnite 1 & 2 mineral claims cover ground that was formerly covered by the Sprout 3 mineral claim owned by Newmont Exploration of Canada Ltd. Crews working for Newmont Exploration in 1982 & 83 conducted reconnaissance geological mapping and widely spaced (25 x 100 m) geochemical soil surveys over the Sprout 3 mineral claim. The Pat Lake stibnite occurrence was "rediscovered" by the Newmont crews during the course of their surveys. The occurrence, located just 50 metres from the south shore of Pat Lake had been exposed by shallow blasting over an area of 4 square metres by earlier workers. Newmont lost interest in the showing, and in the property generally, following negative gold assays from stibnite samples and gave up ownership of the Sprout 3 mineral claim.

In 1988, the old Pat Lake stibnite showing was covered by the London 2 mineral claim staked by the writer as agent for a second party. A detailed geochemical soil survey was conducted over the Pat Lake stibnite occurrence by the writer in 1989, and a second stibnite occurrence, located 500 metres west of the Pat Lake occurrence, was discovered.

In 1990, the London 3-5, 2-post mineral claims were staked to adjoin the southwest corner of the London 2 mineral claim, and in 1991 a ground magnetometer survey was conducted over the London 4 mineral claim and portions of the London 2 & 3 mineral claims.

The London 2-5 mineral claims subsequently lapsed and the Stibnite 1 & 2 mineral claims were staked by the writer in 1995 to cover the Pat Lake stibnite occurrence and the second stibnite occurrence (the 1989 discovery) located 500 metres to the west.

## REGIONAL GEOLOGY AND MINERALIZATION

The Savona Mercury Belt, illustrated on Figure 3 accompanying this report, extends 50 km from Criss Creek on the North, to Tunkwa Lake on the South. Several of the historic mercury occurrences are located within a 15 km radius of Savona near the western end of Kamloops Lake.







The map indicates that the mercury prospects occur within either Upper Triassic Nicola Group or Cretaceous(?) metavolcanics and metasediments that lie in close proximity to the Copper Creek Intrusions.



The mercury showings are all associated with carbonate replacement zones within highly faulted country rock. The mercury content at the Savona mercury prospects is generally much less than 0.1%, and non-economic. However, it is the large size of some of the carbonate replacement zones and the intensity of repeated faulting that suggests that the mercury prospects could represent the upper horizons of strong epithermal systems which could host precious metal deposits at depth.

Precious metals and base metals have been found within chalcedony and quartz veins cutting some of the replacement zones in the region, suggesting that at least some of the replacement zones do represent strong Late Cretaceous or Early Tertiary mineralized epithermal systems. Gold, in particular, has been found within quartz veins at Criss Creek (see Figure 3).

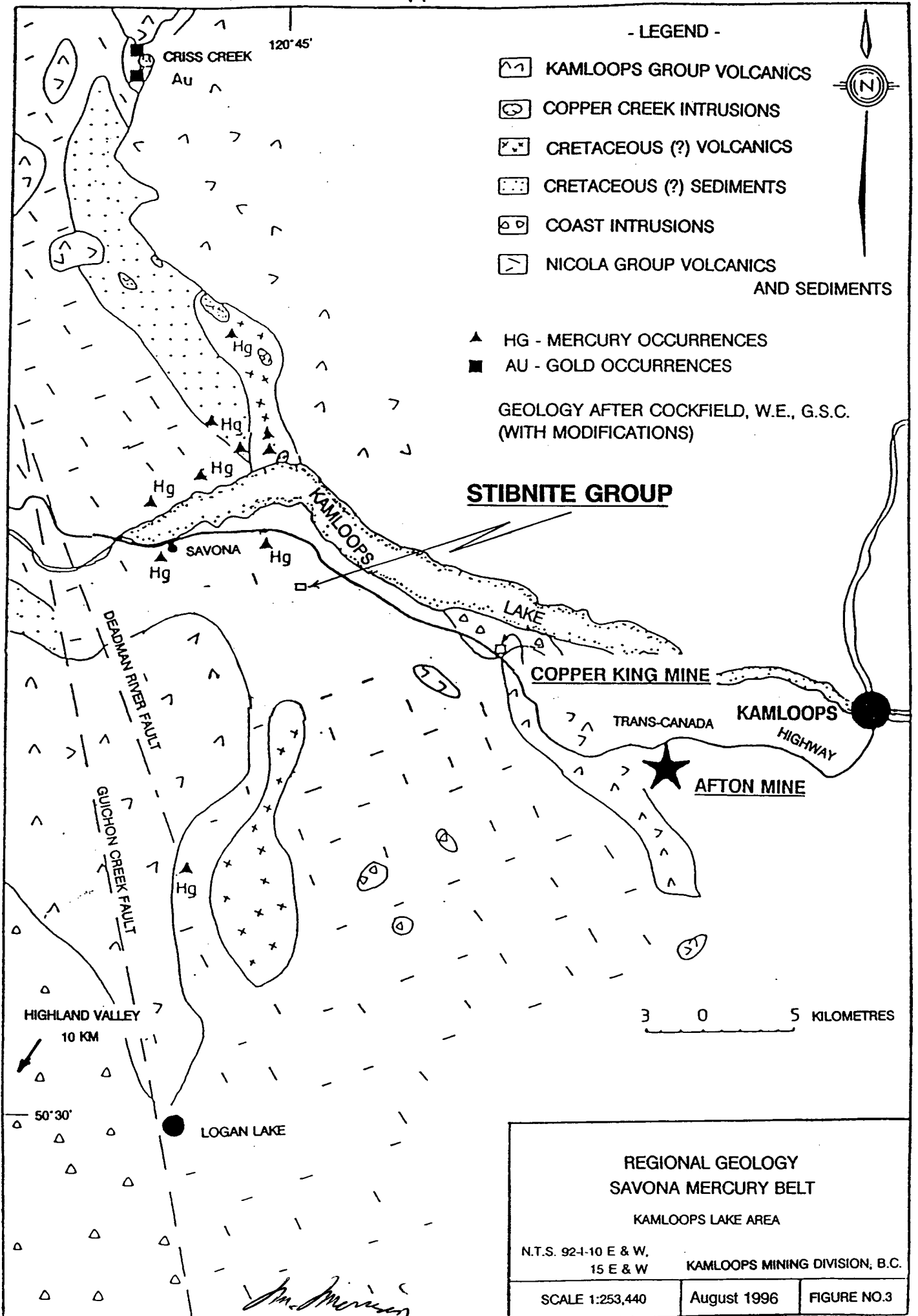
The Newmont Showing, discovered by Newmont Exploration geologists in 1982 and located just 2.5 km southeast of the Stibnite Claim Group, represents another example of precious metal and base metal mineralization that occurs within sheared chalcedony and quartz veins associated with a carbonate replacement zone within Nicola Group metasediments. Sulphide minerals at the Newmont Showing include pyrite, galena, stibnite, sphalerite, arsenopyrite and tetrahedrite.

- LEGEND -

-  KAMLOOPS GROUP VOLCANICS
-  COPPER CREEK INTRUSIONS
-  CRETACEOUS (?) VOLCANICS
-  CRETACEOUS (?) SEDIMENTS
-  COAST INTRUSIONS
-  NICOLA GROUP VOLCANICS AND SEDIMENTS

-  HG - MERCURY OCCURRENCES
-  AU - GOLD OCCURRENCES

GEOLOGY AFTER COCKFIELD, W.E., G.S.C. (WITH MODIFICATIONS)



**STIBNITE GROUP**

**REGIONAL GEOLOGY  
SAVONA MERCURY BELT  
KAMLOOPS LAKE AREA**

N.T.S. 92-I-10 E & W,  
15 E & W

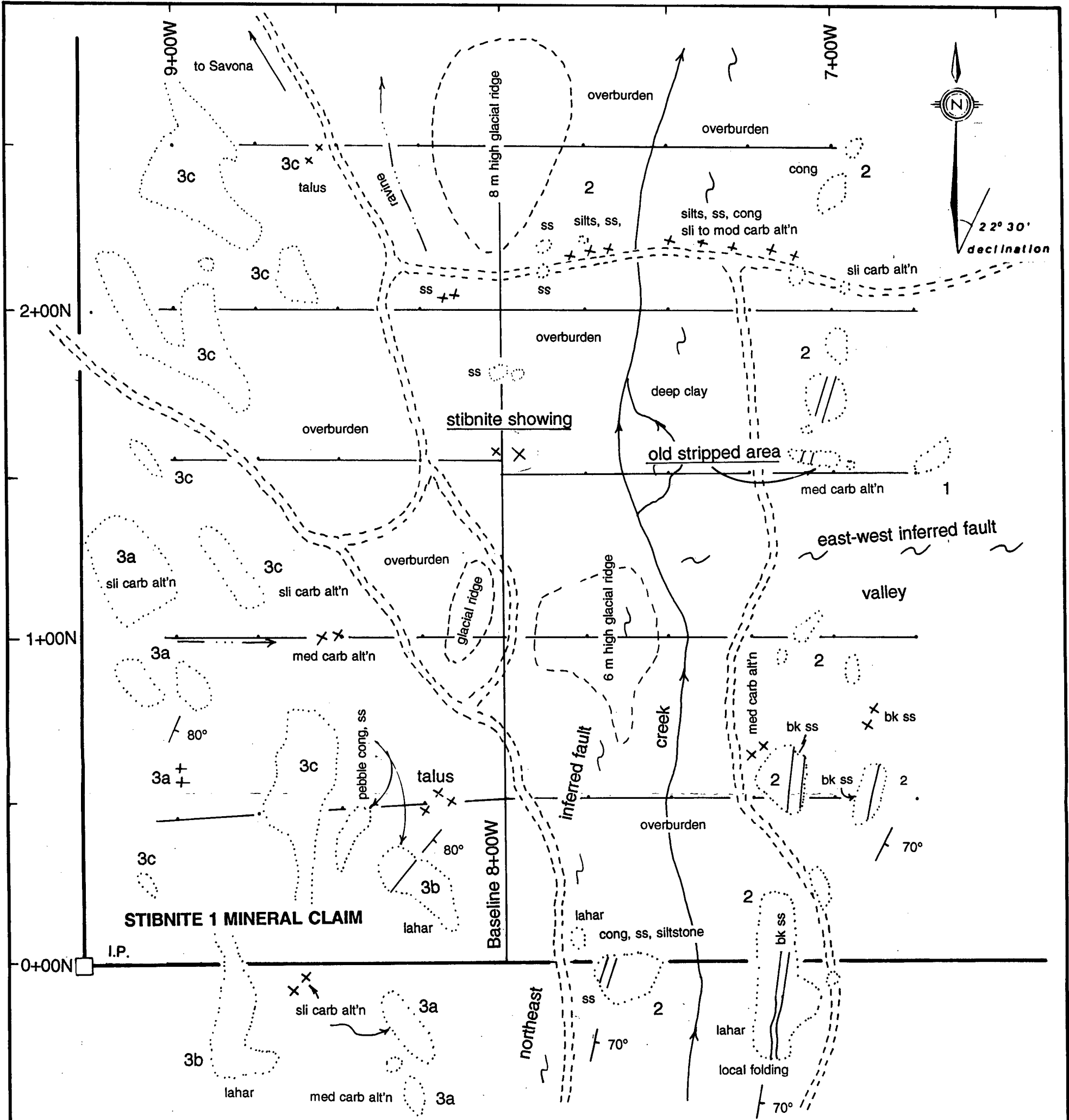
KAMLOOPS MINING DIVISION, B.C.

SCALE 1:253,440

August 1996

FIGURE NO.3

*John Morrison*



**STIBNITE 1 MINERAL CLAIM**

I.P.

Baseline 8+00W

**GEOLOGICAL LEGEND**

UPPER TRIASSIC - NICOLA GROUP

- 1 cobble conglomerate, predominantly basaltic clasts
- 2 pebble conglomerate, mixed clasts: basaltic, andesitic, trachyandesitic  
bk ss = black sandstone interbeds
- 3 cobble and boulder conglomerate/lahar, predominantly basaltic clasts
  - 3a 70% clasts, 30% sandy matrix
  - 3b lahar
  - 3c 30% clasts, 70% sandy matrix

**SYMBOL LEGEND**

- access roads
- outcrop
- bedding
- inferred faults



Scale 1:1250

*M. Morrison*

<b>STIBNITE GROUP</b>	
<b>GEOLOGY STIBNITE 1 MINERAL CLAIM</b>	
Southwest Corner	
Kamloops Lake Area	
Kamloops Mining Division, B.C.	
Drawn by: M.M.	N.T.S. 92-I-10E+W
August 1996	Figure No. 4

## PROPERTY GEOLOGY

### Upper Triassic Nicola Group

The geological mapping illustrated on Figure 4 shows a sequence of metasediments of the Upper Triassic Nicola Group that generally strike 010 to 015 degrees and dip steeply southeast. The metasediments are volcanoclastic and are comprised predominantly of basaltic material, although andesitic and trachyandesitic clasts are also common. Limestone clasts are also present, but rare.

The metasediments range from siltstones to medium and coarse grained sandstones to grits and pebble conglomerate, and finally to cobble and boulder conglomerates.

Generally the clasts of the conglomerates are subangular to subrounded. The depositional environment was fast-changing. Sandstones are interbedded with pebble conglomerates which in turn are interbedded with poorly sorted cobble and boulder conglomerates. Some of the coarse, poorly sorted conglomerates are possibly lahars, and they have been mapped as such (unit 3b).

The clast to matrix ratio is variable within the conglomerates. One series of conglomerates (unit 3a) has 70% clasts and 30% sandy matrix, while another (unit 3C) has the reverse, 30% clasts and 70% sandy matrix.

Some conglomerates are highly indurated, while others are less so, and it appears that those with the most matrix material are the most indurated. The lahars are generally poorly indurated.

Although the metasedimentary sequence is highly variable an attempt has been made to map the units based on clast size and composition.



**PROPERTY GEOLOGY** continued**Upper Triassic Nicola Group** continued

Unit 1, lying on the east side of the map area, is a cobble conglomerate with 30% clasts of 3-6 cm size and 70% sandy matrix. The rock is well indurated.

Unit 2, lying to the east of Baseline 8+00W, is made up of a series of bedded siltstones, sandstones, and pebble and cobble conglomerates. The black sandstones and siltstones are derived of volcanic material. The conglomerates are of mixed volcanic clasts of basalt, andesite and trachyandesite. Rare limestone clasts are also present. The conglomerates of unit 2 are moderately sorted.

Unit 3, lies mostly to the west of the 8+00W Baseline. Unit 3 sediments are generally poorly sorted with clasts up to 30 cm in size comprising up to 30 to 70% of the rock. The clasts, predominantly of basaltic composition, are subangular to subrounded. Some of the Unit 3 conglomerates have been mapped as lahars.

The metasediments have been metamorphosed to the green-schist facies.

**PROPERTY GEOLOGY** continued**Structure and Faulting**

The Upper Triassic Nicola Group volcanoclastic metasediments on the Stibnite 1 mineral claim form a monoclinial sequence that strikes 010 to 015 degrees and dips steeply (70 to 80°) southeast. Graded beds studied at one site suggest that the older rocks lie to the southeast, and go up-sequence to the northwest. In other words, the metasediments are slightly overturned.

The metasediments reflect both quiescent and catastrophic (eg. lahars) periods of deposition.

Some of the sandstone beds display both local folding and brittle segmentation. In fact, in several places the local folding and warping does not allow for accurate measurements of bedding attitudes. The massive conglomerates, too, generally reveal few stratigraphic features to help with the determination of attitudes.

A well defined northeast-striking topographic depression (in part followed by the present day creek on Figure 4) is inferred to be a fault. The depression extends beyond this year's mapped area to the southwest. Some of the local folding and warping of the metasediments may be attributed to movement along this fault.

A second, less well defined, east-west depression located near L 1+00N on the east side of the map area is also believed to represent a fault.

Both inferred faults show a close spacial relationship with the zones of strongest carbonate alteration on the property. Regionally, carbonate/silica replacement zones are often fault controlled (please see next section on Alteration and Mineralization).

**PROPERTY GEOLOGY** continued**Alteration and Mineralization**

The most noticeable alteration within the mapped area is limonite staining. The limonite is derived from the weathering of ankerite which occurs as a replacement mineral within the volcanoclastic metasediments. Late ankerite, dolomite and chalcedony veinlets also cut the metasediments locally. The degree of veining is variable (usually 1-5% of the rock) and the intensity of the limonite staining is directly proportional to the degree of veining.

Noteworthy zones of carbonate replacement are located at the old stripped zone at grid 1+50N, 7+10W, and at the road near L 2+00N for 25 metres on either side of the inferred northeast fault.

The carbonate replacement at the old stripped area fades over a distance of 10 metres to the north, but intensifies to the south (towards the east-west inferred fault) before being concealed by overburden.

Near L 2+00N, rocks along the road have been dislodged by road building, but the carbonate replacement of the metasediments does increase towards the trace of the northeast inferred fault illustrated on Figure 4. In fact, carbonate replacement of the metasediments extends up to 40 metres from the fault within the mapped area to the south of the road.

Weak to moderate carbonate replacement also occurs within metasediments west of Baseline 8+00W on L 1+00N and for 30 meters to the north. The east-west inferred fault has not been extended to this area on Figure 4, but if extended it would project through the altered rocks.

**PROPERTY GEOLOGY** continued**Alteration and Mineralization** continued

The stibnite showing at 1+50N, 8+00W is very poorly exposed, but broken samples from the site reveal that blebs and smears of stibnite occur within a volcanoclastic rock that has been almost entirely replaced by silica. The character of the stibnite and the intensity of the silica replacement at this site is very similar to that at the Pat Lake stibnite occurrence which is located 500 metres to the east. The Pat Lake occurrence lies within 150 metres of a quartz-eye felsic intrusive and it is most probably related to the intrusive.

Although no intrusive has been mapped near the stibnite showing at grid 1+50N, 8+00W the degree of silicification and surrounding carbonate alteration suggest that an intrusive body is located nearby. Much of the immediate surrounding area is covered by overburden and a program of trenching or drilling will be required to better appraise the prospect (see Discussion).

## DISCUSSION

Geological mapping up to 3 km to the east and west of the Stibnite Claim Group by the writer over a period of several years has indicated that all of the carbonate/silica replacement zones within the Upper Triassic Nicola Group metasediments are related to high-level quartz-eye porphyry or amorphous rhyolite intrusive rocks. The intrusive rocks are not always immediately adjacent to the replacement zones, but they are generally close by, either horizontally or vertically.

The emplacement of the intrusive rocks (and the mineralized replacement zones associated with them) has been controlled by late faults cutting the Nicola Group rocks. Common fault directions on neighbouring properties are northwest, northeast and east-west.

The northeast and east-west inferred faults mapped on the Stibnite 1 mineral claim fit well with the regional geology and the fact that the stibnite showing at grid 1+50N, 8+00W occurs near the intersection of both faults is not considered to be coincidental.

As mentioned previously, the stibnite at 1+50N, 8+00W occurs in metasediments that have been entirely replaced by silica, and one outcrop of sandstone near the showing exhibits some carbonate replacement. The stibnite occurrence, like others in the immediate district, appears to be associated with a high-level intrusive that has invaded the Nicola Group rocks along a zone of weakness.

The stibnite occurrence itself is not considered economic, but it may indicate that a strong epithermal system is associated with the inferred faults crossing the property. It is thought that at some moderate depth these faults could host precious metal deposits. For instance, the Newmont showing located 2.5 km to the southeast, demonstrates that precious metal values do accompany stibnite and other minerals in the district (see Regional Geology and Mineralization).

**DISCUSSION** continued

Although the Newmont showing is small the potential of the Stibnite 1 mineral claim prospect is unknown and it could extend for some distance along the northeast inferred fault.

The stibnite showing at 1+50N, 8+00W is very poorly exposed and yet the overburden is believed to be shallow in the immediate area. A backhoe could probably be used to explore this prospect with ease. A trenching or shallow percussion drilling program should then be considered to test the northeast inferred fault both to the northeast and southwest of the stibnite occurrence. All samples collected should be tested for 30 elements by ICP methods and for gold by Atomic Absorption.

## CONCLUSIONS AND RECOMMENDATIONS

This year's geological mapping program conducted over the southwestern corner of the Stibnite 1 mineral claim located near Kamloops Lake demonstrated that the stibnite prospect on the property has several features in common with other mineralized occurrences in the district.

The region is underlain by a monoclinial sequence of northerly-striking, steeply dipping, Upper Triassic Nicola Group volcanoclastic metasediments. Late faulting (northeast, northwest and east-west) has dissected the metasedimentary sequence and the faulting has allowed for the injection of high-level felsic intrusions. Volatile gases and solutions originating with the intrusions have invaded the volcanoclastic metasediments resulting in carbonate and/or silica replacement of the rock along, or near, fault zones. Locally, cinnabar, stibnite, arsenopyrite, tetrahedrite, pyrite, sphalerite, galena, gold and silver have been deposited within the replaced rocks.

The Newmont Showing (see Regional Geology and Mineralization) proves that significant precious metals values are sometimes introduced into the replacement zones. The Newmont Showing, located 2.5 km southeast of the Stibnite Claim Group, hosts the full suite of minerals listed above with values as high as 3.2 g/tonne gold and 180 g/tonne silver.

The monoclinial sequence of Upper Triassic Nicola Group volcanoclastic metasediments that underlies the Stibnite Claim Group is similar to that on neighbouring properties. The metasediments are cut by northeast and east-west faults (inferred), and the stibnite prospect on the Stibnite 1 mineral claim lies near the intersection of these faults. The stibnite (1-2%) occurs within volcanoclastic rock that has been entirely silicified.

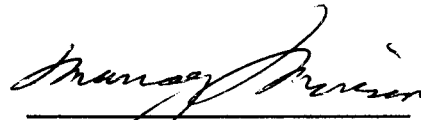
The stibnite showing, although poorly exposed, is considered to be a worthy exploration target. It may represent the upper horizon of an epithermal system that could host precious metals at some moderate depth below surface. The system represented by the stibnite prospect could extend along the northeast inferred fault for some distance both to the northeast and southwest of the stibnite prospect.

**CONCLUSIONS AND RECOMMENDATIONS** continued

A trenching program is recommended to better expose the stibnite showing on the Stibnite 1 mineral claim. A series of trenches or shallow percussion drill holes are also recommended to test bedrock along the northeast inferred fault. Samples should be collected and analyzed for 30 elements by the ICP method and for gold by Atomic Absorption.

The stibnite prospect is very accessible, and water for drilling purposes is on site.

August 1, 1996  
Kelowna, B.C.

  
Murray Morrison, B.Sc.



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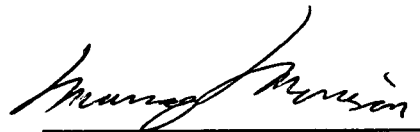
\* Assessment Reports filed with the Ministry of Energy, Mines and Petroleum Resources of British Columbia.

APPENDIX ASTATEMENT OF QUALIFICATIONS

I, Murray Morrison, of the City of Kelowna, in the Province of British Columbia, do hereby state that:

1. I graduated from the University of British Columbia in 1969 with a B.Sc. Degree in Geology.
2. I have been working in all phases of mining exploration in Canada for the past twenty-six years.
3. During the past twenty-six years, I have intermittently held responsible positions as a geologist with various mineral exploration companies in Canada.
4. I have conducted several geological, geochemical, and geophysical surveys on mineral properties in Southern British Columbia during the past twenty-six years.
5. I conducted the Geological Mapping Program outlined in this report.
6. I own a 100% interest in the Stibnite 1 & 2 mineral claims.

August 1, 1996  
Kelowna, B.C.

  
Murray Morrison - B.Sc.

APPENDIX BSTATEMENT OF EXPENDITURES - ON THE STIBNITE CLAIM GROUP

Statement of Expenditures in connection with a Geological Mapping Program carried out on the Stibnite Claim Group, located 35 km west of Kamloops, B.C. (N.T.S. Map 92-I-10E&W) for the year 1996.

GEOLOGICAL MAPPING (1.5 ha)


M. Morrison, geologist	2 days @ \$300.00/day	\$ 600
Truck, 4 x 4 (including gasoline and insurance)	2 days @ \$75.00/day	150
Meals and Lodging	2 days @ \$70.00/day	140
Flagging and belt chain thread		--
	Sub-total:	\$ 890

REPORT PREPARATION COSTS

M. Morrison, geologist	1 day @ \$300.00/day	\$ 300
Drafting		--
Typing		107
Copying reports		<u>20</u>
	Sub-total:	\$ 427
	Grand Total:	\$ <u>1,317</u>

I hereby certify that the preceding statement is a true statement of monies expended in connection with the Geological Mapping Program carried out April 29 - May 1, 1996.

August 1, 1996  
Kelowna, B.C.

  
Murray Morrison - Geologist