

010415

R E P O R T

ON

LEM AND NOVA CLAIMS

HIGHLAND VALLEY, B. C.  
KAMLOOPS M. D.

FOR

LAWRENCE MINING CORP.  
558 Howe Street,  
Vancouver, B. C.

by

R.H. Seraphim, Ph.D., P.Eng.

October 31, 1979

*Chataway Lakes*

*area*

**LEM + NOVA**

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## SUMMARY AND CONCLUSIONS

The Lem and Nova claims are located in Highland Valley 5 to 10 kilometers south and east of Highmont. The ground they cover has been mapped geologically and most if not all of it has been tested by I.P. and geochemical surveys. However, one of the contacts of best geological potential, the Bethsaida - Skeena contact south of the old Stellako showing, may remain without adequate test because of deep overburden.

Parts of the Skeena - Chataway contact, particularly towards the south end of the claim group, also may be without adequate test for the same reason.

A northeasterly structural trend towards Chataway Lake might provide disruption with accompanying mineralization in these areas of contact.

Increasing copper and molybdenum prices make the area of renewed interest, and the recent (October 1978) publication of the Ministry of Mines, Preliminary Map 30, provides new information on its geology.

RECOMMENDATIONS

The abundant data from earlier exploration in the area should be evaluated in more detail and correlated both with the detailed maps accompanying Preliminary Map 30 and with the Induced Polarization (I.P.) survey completed in 1979 by Lawrence. The I.P. survey should be continued to the south boundary of the claim group. Drilling of the best I.P. anomalies, particularly those near the Bethsaida - Skeena contact, is recommended. The I.P. anomaly near the disruption of the contact near Jay 11 appears the most attractive geologically.

I.P. anomalies in Highland Valley type mineralization are at best very subtle even where overburden is shallow. The percussion drill Holes D-11 and D-12 near the southern end of the claim group did not reach bedrock, indicating that overburden on the Bethsaida-Skeena contact is deep in that vicinity. Consequently, diamond drilling or rotary drilling may be necessary to test anomalies however subtle, in this area.

COSTSSTAGE I

Compilation of detailed maps and evaluation of data, including ground check, supervision of surveys and drilling, continued co-ordination of results. . . . .	\$ 15,000
Continued I.P. Surveys. . . . .	20,000
Diamond or percussion drilling (choice dependent on overburden depth). . . . .	<u>50,000</u>
	<u>\$ 85,000</u>

STAGE II

(If areas of additional interest are  
found by the continued I.P. Survey or  
if important mineralization is found  
in Stage I.)

Diamond or percussion drilling. . . .	\$ 125,000
Sampling, assaying, expediting. . . .	15,000
Engineering, supervision, data compilation. . . . .	<u>25,000</u>
	<u>\$ 165,000</u>

TOTAL - Stages I and II . . . . .	<u><u>\$ 250,000</u></u>
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INTRODUCTION

The writer examined several parts of these claims at intervals from 1965 to 1967 and directed exploration on the Stellako prospect, in the close vicinity, in 1967. The Lem and Nova claims were re-examined on October 6, 1979 to inspect some new trenching by bulldozer. This current report updates a private report dated April 7, 1979.

Copious data collected by R.B. Stokes, P.Eng. and reviewed as a basis for this report include the following and numerous older reports:

McMillan, W.J. and Osatenko, M.J.

1977 "Guidebook Guichon Creek Batholith and Mineral Deposits", Field Trip No. 3  
Geol. Assoc. Can. and Soc. Ec. Geol.  
Joint Annual Meeting.

McMillan, W.J.

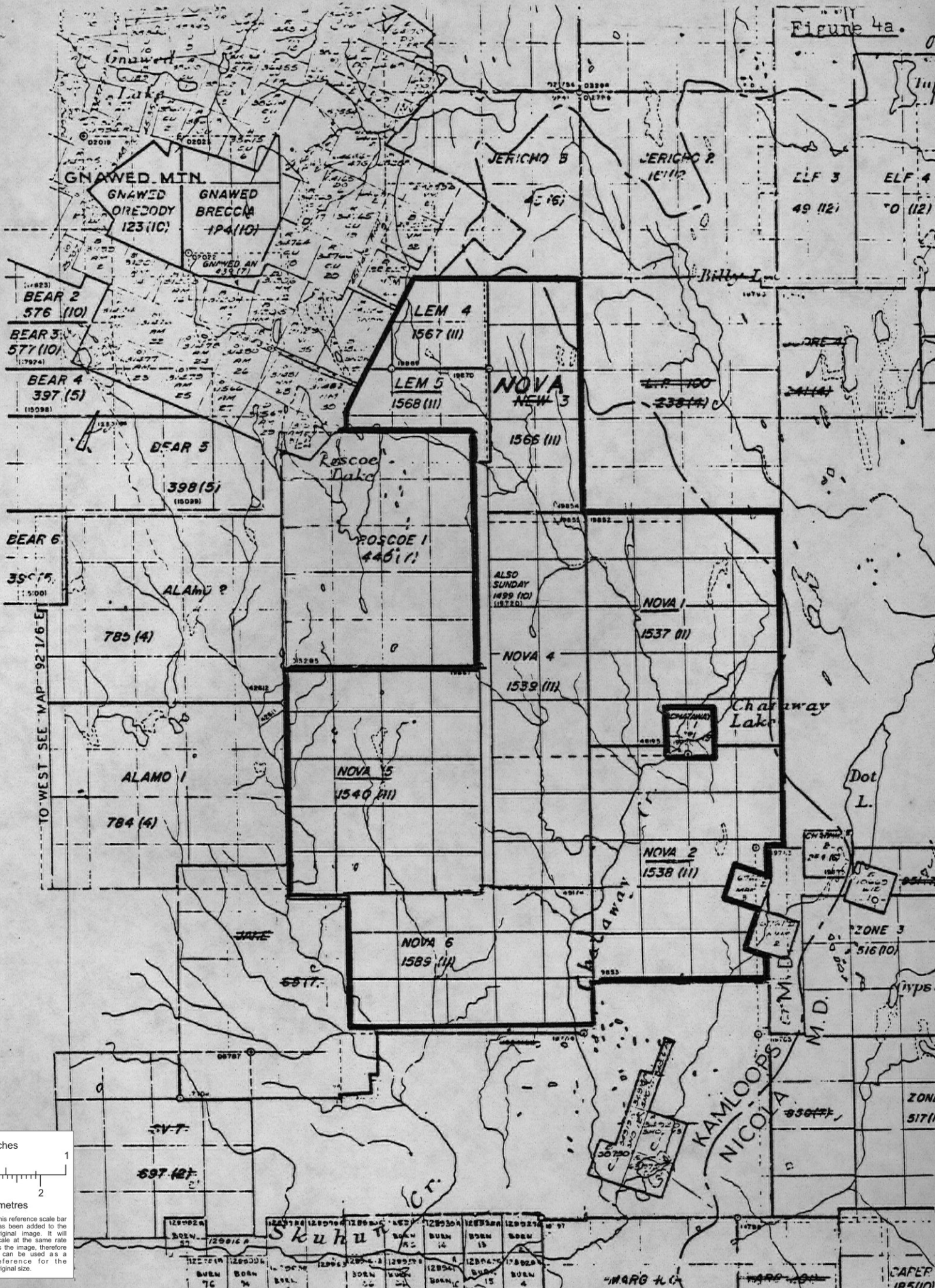
1978 "Geology of the Guichon Creek Batholith"  
Notes and Legend to Accompany Preliminary  
Map No. 30.  
Brit. Col. Min. of Mines and Pet. Resources.

Saleken, L.W.

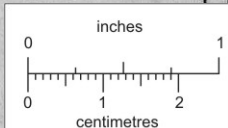
1977 "Skuhun Project, 92I-7W, Highland Valley,  
B.C."  
Company Report.

Figure 4a.

5



TO WEST - SEE MAP - 92-1/6-E



This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

3

The writer was assisted by T. Lisle, P.Eng. in compiling data onto the map accompanying this report and with advice regarding some of the areas recommended for further exploration.

CLAIMS

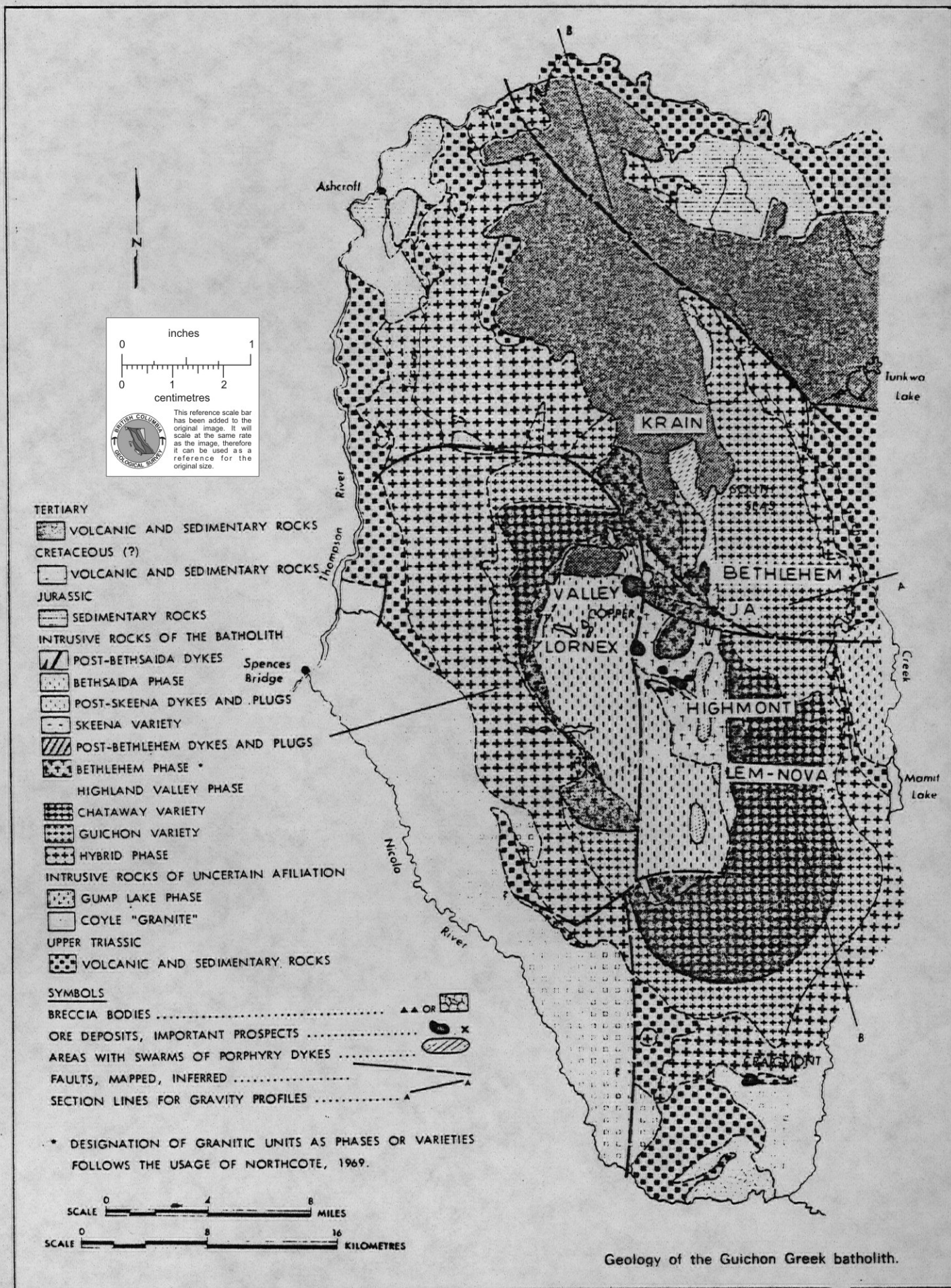
<u>Name</u>	<u>Recorded Owner</u>	<u>Location Date</u>
Lem 4	R.B. Stokes M	Nov. 10, 1978
Lem 5 (A)	" " M	Nov. 10, 1978
Nova 1 (A)	" " K	Nov. 9, 1978
Nova 2 (A)	" " M	Nov. 9, 1978
Nova 3 *	" " K	Nov. 10, 1978
Nova 4	" " M	Nov. 9, 1978
Nova 5 (A)	" " K	Nov. 9, 1978
Nova 6 **	" " M	Nov. 5, 1978

\* shown on recording map as New 3.

\*\* reported held by R.B. Stokes via bill of sale.

These claims include ground previously held in part by Chataway Explorations, Pathfinder Mines, Oro Mines, Mercury Exploration, Stellako Mining Co. and R.B. Stokes.





The records of the claims shown as (A) are stamped "Appear to be staked in contravention of Sec. 6 of the Mineral Act", but the map does not show sufficient contravention to affect the recommended program.

#### LOCATION, ACCESS, TOPOGRAPHY

The location with respect to Bethlehem, Highmont, Lornex, and Valley Copper is shown on the accompanying map. Access is best via the Chataway Lake and past Craigmont Mine from Merritt. Alternative routes are up Skuhun Creek from the Merritt - Spences Bridge highway or via Highmont and Sheba property roads from Highland Valley.

The area of the claims has very little relief with elevation ranging from 1500 meters to 1700 meters above sea level. Most of the area, except for a few swamps, is lightly timbered with jackpine, fir, and spruce. Underbrush is found only near streams and swamps. Overburden is thick in many places, and may be several hundred feet thick near the southern end of the claim group.

HISTORY

Work by Chataway, Bralorne, King Resources and Asarco during the period 1956-1970 is summarized below.

Linecutting, Surveying

Chataway - grid on Western Half and part of Eastern Half; legal survey on northwest boundary.

Bralorne - separate grid on Southeast Quarter.

King Resources - resurvey of grids and some claim posts.

Magnetometer Survey

Chataway - over Northern Half from Dot Lake, west; small surveys in south central and around Zone 4.

Bralorne - over entire Southeast Quarter.

King Resources - over a small portion in Three Creeks area.

Induced Polarization and Electro Magnetic Surveys

Chataway - two small I.P. surveys by Canadian Aero, one small I.P. survey by Seigel and a small combined I.P.-E.M. survey by Selmser, all in the Northwest and Central areas.

Bralorne - large survey over most of Southeast Quarter by Seigel, several anomalies resurveyed.

King Resources - test lines run on Zone 4 and south of Chataway Lake; entire Western Half surveyed, data not compiled.

### Geochemical Surveys

- Chataway - soil sampling of almost entire Northern and Western sections, analysis by rubeanic acid and cold extraction methods.
- Bralorne - soil sampling of entire Southeast Quarter using cold extraction method.
- King Resources - stream sediment sampling of drainages on Western Half; soil sampling of most of Western Half, analysis by hot extraction and atomic absorption.

### Trenching

- Chataway - most of the known showings on the claim group have received limited bulldozer trenching.
- Bralorne - on Southeast Quarter only; most grid lines were cut out with a D-7 bulldozer and trenching was carried out on many geochemical, magnetic and I.P. anomalies.
- King Resources - limited hand trenching on Zone 4, Sho 11, and in Northwest Quarter.
- Asarco - attempts were made to collar all drill holes in bedrock.

### Diamond Drilling

- Chataway - approximately 50 holes aggregating about 12,000 feet drilled between 1960 and 1967, several were stopped in overburden. The majority were drilled on showings such as Zone 4, Three Creeks and Sho 11.
- Bralorne - in Southeast Quarter only; 7 holes drilled of which 4, aggregating 1,118 feet, reached bedrock.

### Percussion Drilling

- Bralorne - between 1965 and 1967, 20 holes aggregating 4,448 feet were drilled in Zone 4, and 8 reconnaissance holes in the Southeast aggregating 1,185 feet. Several of these were lost or abandoned in overburden.
- Asarco - between January and October, 1970, a total of 148 holes aggregating 16,950 feet were drilled of which 32 did not reach bedrock. The majority of these holes were drilled on a 2,000 foot reconnaissance grid to a maximum depth of 250 feet. Majority of holes averaged approximately 100 feet in depth and were designed to test bedrock to a minimum depth of 80 feet.

### Miscellaneous Work

Geological mapping at 1" - 1,000' over the entire property and at various scales on some of the mineral showings has been partially completed by Chataway and King Resources.

A photo mosaic and topographic map was compiled by Chataway. Infra-red photography, photo interpretation and a fracture density study were completed on much of the claim area by King Resources. (Saleken - 1978)

Work since 1970 is reported to include:

#### International Mogul -

Two diamond drill holes in Jay 11 area, one in Northwest area, and one in Chataway Lake area. - 1971

Five diamond drill holes on old 'Chataway' claims that are now Nova 1 and 2.

#### Stokes Exploration Management Co. Ltd. -

Magnetometer survey in the vicinity of Mystery Lake.

Western Mines Limited -  
Geochemistry on Jay 11 and N.W. areas.

Some of the data from the above work is shown on the accompanying map, and all of the surveys used for assessment purposes prior to 1970 are shown on an index map published by the B.C. Dept. of Mines. Those not listed above should be obtained and re-evaluated.

GEOLOGY

The most recent description of the geology of the area is that by W.J. McMillan (1978) -

"The (Guichon Creek) batholith is segmented by a series of north and northwest-striking faults which are related to the stresses which created the regional tectonic fabric. These regional stresses, which were apparently in existence during and possibly after the emplacement of the batholith, continued or were reactivated shortly after its emplacement."

Southeast trending glaciation, parallel and sub-parallel to the fault system, obscures many of the faults, and covers much of the terrane with till. Consequently much of the several contact zones between the several phases of the batholith are interpolated on the geological maps, and subject to revision.

The contact zones are of primary importance in that the better grade of copper molybdenum mineralization is found on or near the contacts,

particularly when they are disrupted by faults and by brecciation.

The nature of the host rock is also of primary importance in that the most silicious rocks, which are the youngest and occur near the core of the intrusion, host the largest and best grade ore bodies. The Bethsaida phase of intrusion is the most silicious and youngest, and is shown on B.C. Dept. of Mines Preliminary Map 30 to extend southerly through Nova 5 and Nova 6 claims.

A north trending stream of dykes of Bethsaida, or near-equivalent age and rock type, intrude the Skeena phase of the intrusion (next to the core of Bethsaida) and individual dykes also constitute favorable loci for deposition of copper and molybdenum mineralization. Some of the dykes probably exist on Lem-Nova claims but would be obscured by overburden.

#### MINERALIZATION

The batholith is host to British Columbia's most important porphyry copper molybdenum district

"within which there are two producing mines: Bethlehem Copper and Lornex; three potential mines: Valley Copper, Highmont, and J.A., and numerous showings. Reserves of the major deposits are estimated to exceed 2 billion tonnes of 0.45 percent copper equivalent. The major deposits all occur along the northern border of the core zone of the batholith. The copper and molybdenum mineralization is almost entirely fracture controlled and ore deposits occur in areas with closely spaced fractures."

(McMillan, W.J. 1978)

Mineralization reported to date on Lem Nova claims includes the following showings:

- (1) Mystery Lake - "Copper mineralization accompanied by chloritic and sericitic alteration in fracture zones."
- (2) N.W. Area - "Three exposures that are moderately fractured ----- containing mild, skin-deep alteration, minor amounts of malachite."
- (3) Three Creeks - "The rocks are moderately fractured with alteration applied to the walls of fracture planes. Rusty weathering is deep. Widespread and sparse amounts of malachite are noted. The exposure is approximately 600' wide."
- (4) Jay 11 - "The Skeena rocks have been intensely altered and fractured for distances up to 50 feet from the contact. Minor amounts of malachite and chalcocopyrite associated with magnetite were noted. A northeast trending fault traverses the exposure and a Bethesda dyke intrudes adjacent to the east of the exposure."



- (5) Moss 4 - "Bulldozing has uncovered rusty weathered and moderately altered rocks in Chataway close to the Skeena - Chataway contact. Boulders by the trenches showed bornite and chalcopyrite in quartz veins, however, none were seen in place."

Several other areas of mineralization of similar character named, Bob 6, Roscoe Creek, Chataway Lake, Sho 11, and Sho 23, are also reported on or in the vicinity of Lem-Nova claims.

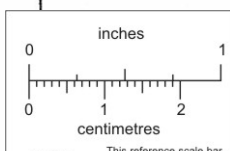
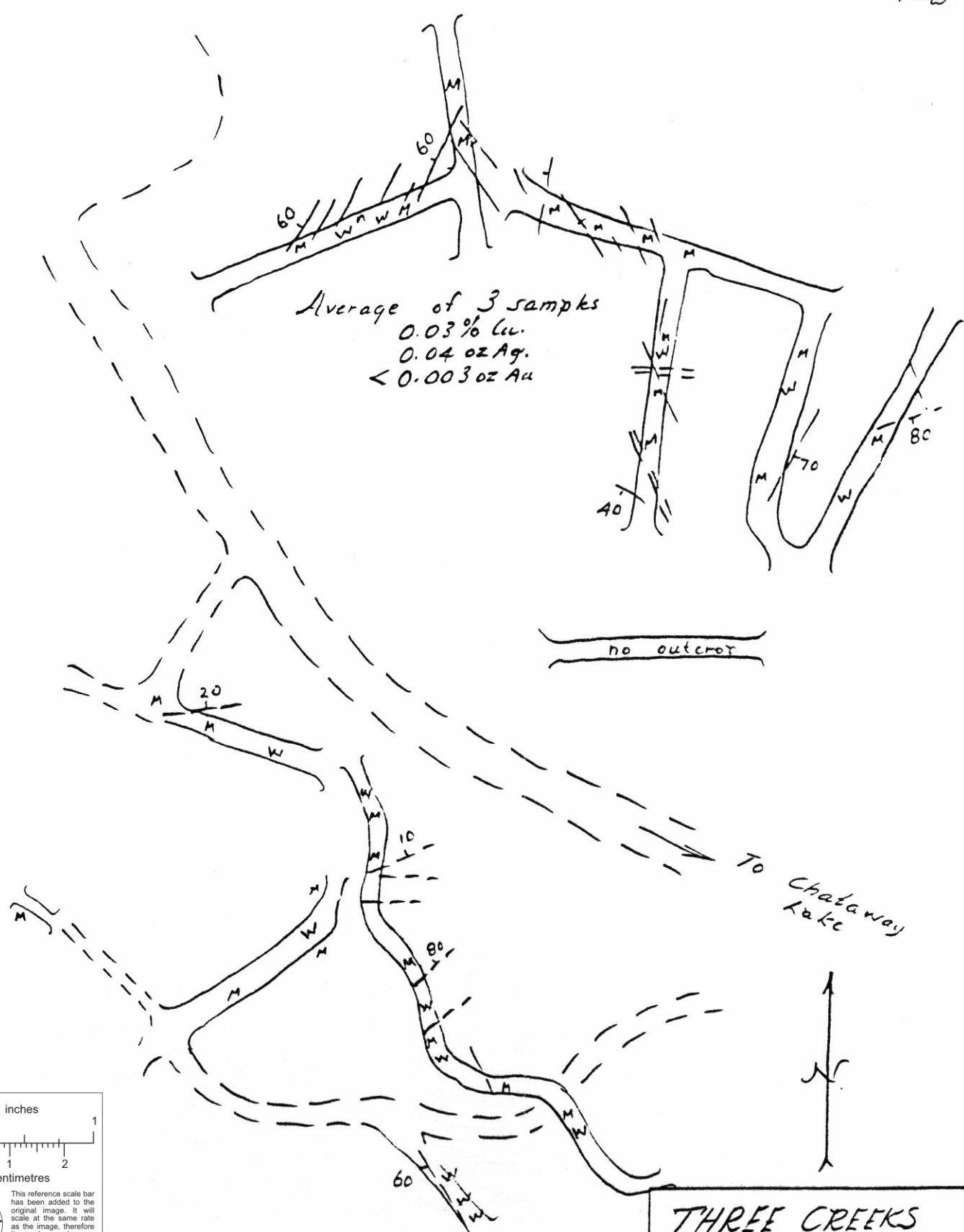
#### GEOPHYSICS AND GEOCHEMISTRY

The location and extent of the surveys completed to 1970 are shown on the accompanying map. Individual surveys should be checked for validity of data in that I.P. surveys may be of too great a 'spread' to locate smaller bodies of sulphide, or too small a 'spread' to test beneath thick overburden.

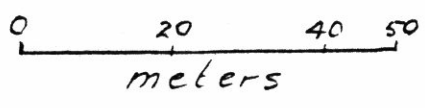
A search of assessment work records should be made and those I.P. surveys completed in Moss 4 area should all be obtained. This area may be important in that a cross-trend, northeasterly towards Chataway Lake, may provide disruption and thus be a locus for mineralization at the northerly striking Bethsaida - Skeena contact.

Lawrence Mining Corp. completed in 1979 a new Induced Polarization (I.P.) survey with 'spreads' suitable to test the rocks at depth greater than those obtained in the earlier completed I.P. surveys. The preliminary I.P. survey map is not at the same scale as the available geological maps, and lacks fiducials such as roads, lakes, or streams that would permit accurate correlation with the geology.

The survey shows two series of broad anomalies. One series follows that Bethsaida - Skeena contact zone and the other is proximate to the Skeena - Chataway (or Bethlehem phase) contact. Inasmuch as the Bethsaida - Skeena contact has produced most of the larger ore bodies in the district, i.e. Valley, Lornex, J.A. and Highmont, the author would give highest priority to drilling the best anomalies found on this contact. However, the presence of smaller ore bodies, such as at the Bethlehem mine on the next contact (Bethlehem phase to Highland-Valley phase in that instance) makes the almost equivalent contact (Skeena to Chataway or Bethlehem phase at Lem Nova) also worthy of continued exploration by drilling or trenching.



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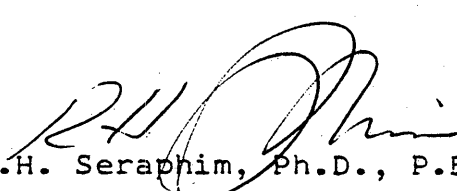


**THREE CREEKS**  
 Trenching  
 Oct/70  
 RHS  
 after W.P.  
 M = malachite  
 W = weathered & altered

DRILLING AND TRENCHING

Lawrence recently extended some old bulldozer trenches in the 'Three Creeks' area. These trenches show strong patchy alteration, numerous fractures, and some irregular sub-ore grade malachite copper mineralization. A sketch of the trenches is presented. Some drill holes had been completed in the area previously.

Many holes, both percussion and diamond-drill, are compiled onto the accompanying map. Some have tested the individual showings named above, some have tested geophysical anomalies, and some are drilled on grids without other purpose. Some of the percussion holes did not reach bedrock. The room between drill holes leaves more than ample space to discover economic mineral deposits.



R.H. Seraphim, Ph.D., P.Eng.

October 31, 1979.

R. H. SERAPHIM ENGINEERING LIMITED  
GEOLOGICAL ENGINEERING


316 - 470 GRANVILLE STREET  
VANCOUVER, B.C. V6C1V5

CERTIFICATION

I, Dr. R.H. Seraphim, of the City of Vancouver, Province of British Columbia, hereby certify as follows:

1. I am a Geological Engineer residing at 4636 West 3rd Avenue, Vancouver, B.C., and with office at #316, 470 Granville Street, Vancouver, B.C.
2. I am a registered Professional Engineer of British Columbia. I graduated with a Master of Applied Science from the University of British Columbia in 1948, and with a Doctor of Philosophy in geology from the Massachusetts Institute of Technology in 1951.
3. I have practiced my profession continually since graduation.
4. I have no interest, direct or indirect, in the Lem and Nova claims or in the securities of Lawrence Mining Corp. or its affiliates, and I do not expect to receive any interest.
5. The attached report is based on a study of maps and reports provided, and on examination of parts of the claims at intervals during the years 1965-79.
6. I consent to the use of this report in or in connection with the prospectus or in a statement of material facts relating to the raising of funds for this project.

Dated at Vancouver, British Columbia this 31st day of October, 1979.

  
\_\_\_\_\_  
R.H. SERAPHIM, Ph.D., P.Eng.