

LOG NO:	0723	RD.
ACTION:		
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**REPORT OF ACTIVITIES  
ON THE  
LIMPOKE CREEK PROPERTY  
(Gran 11 and Canyon 82)**

**LIARD MINING DIVISION  
NTS: 104 G 13**

**OWNERS: Homestake Mineral Development Company  
1000 - 700 West Pender Street  
Vancouver, B.C.**

**and**

**Equity Silver Mines Ltd.  
Suite 13 - 1155 Melville Street  
Vancouver, B.C.**

**OPERATOR: Homestake Mineral Development Company**

**Darcy Marud  
May, 1990**

Distribution  
HMDC - original  
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**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**20,148**

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## 7.0 SUMMARY AND RECOMMENDATIONS

The Limpoke Creek property is located in the Stikine River region of British Columbia. The property consists of two claims, Gran 11 and Canyon 82, totalling thirty eight units and is jointly owned by Homestake Mineral Development Company and Equity Silver Mines Ltd.

Several quartz vein boulders carrying pyrite, galena and tetrahedrite were found along the course of Limpoke Creek during a previous program in June of 1989. These boulders assayed up to 26,200 ppb gold. During this program, the source of the boulders was found to be west of the property under a glacier at the head of Limpoke Creek. Prospecting on the western end of the claim found an outcrop of pegmatitic syenite but no alteration or mineralization could be seen associated with the intrusive, largely because of poor exposure. The source of the highly anomalous heavy mineral samples discovered in June, 1989 can be possibly attributed to fluvial and glacial transport of gold from the showing at the head of Limpoke Creek. Samples collected from a series of pyritic felsic dykes located on the Gran 11 claim returned weakly anomalous gold values but should be followed up as only a small portion of the dykes were sampled.

A program of contour soil sampling is recommended along the whole east - west length of the property. The program should help focus attention on any anomalous gold bearing zones. Further prospecting should also be conducted along the western half of Canyon 82 to locate the extents of the megacrystic syenite .

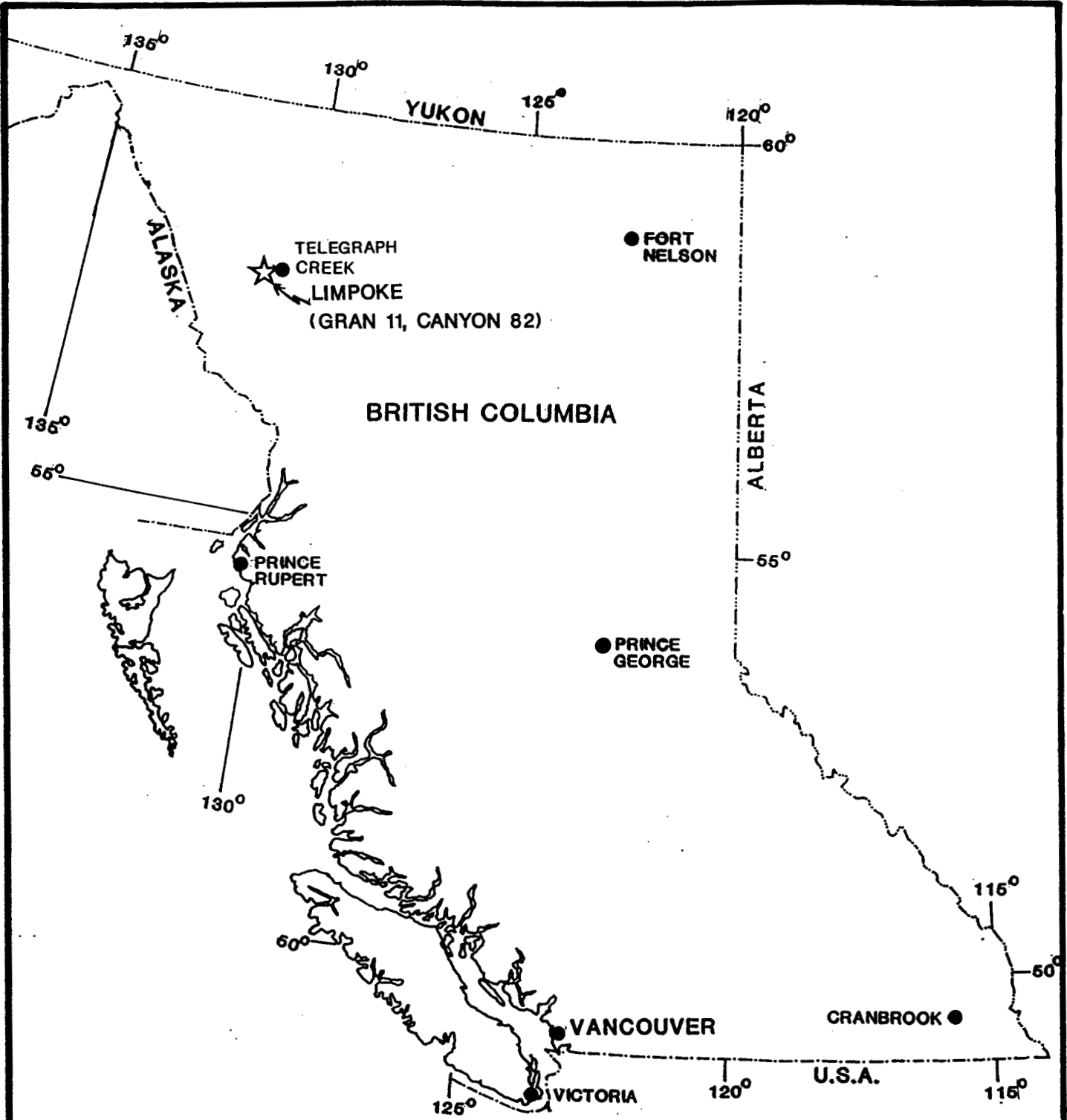
## 1.0 INTRODUCTION


### 1.1 LOCATION

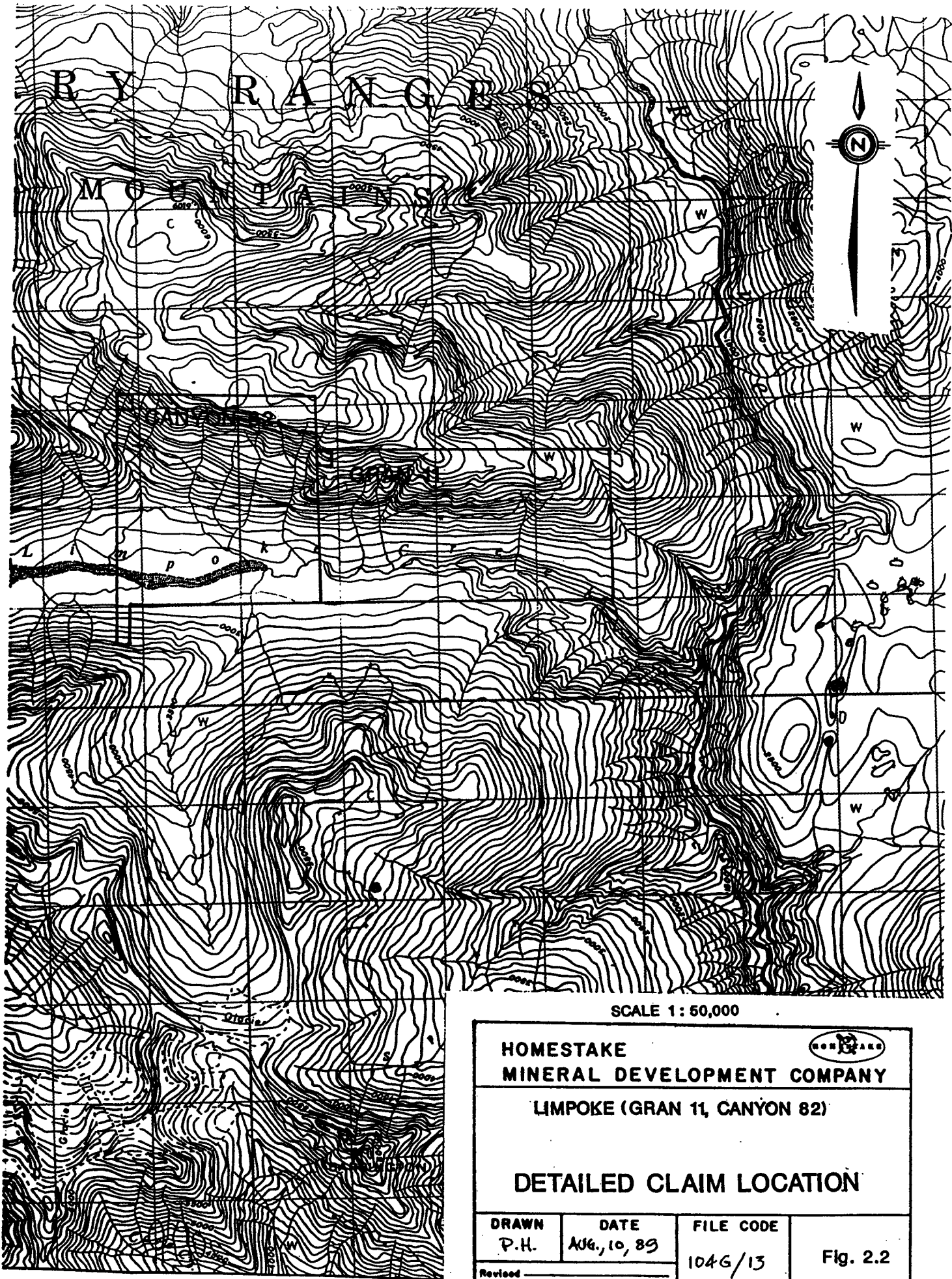
The Limpoke Creek property is located approximately 41 kilometres east-southeast of Telegraph Creek near the headwaters of Limpoke Creek (Figure 2.1 and 2.2). The claims are centered at 57° 49'N latitude and 131° 49'W longitude on NTS map sheet 104 G 13.

### 1.2 PHYSIOGRAPHY

The property lies within moderately-rugged terrain north of the Chutine River. Elevations range from 425 to 1825 meters with treeline at 1050 to 1200 meters. Several small snowfields exist year round at higher elevations to the west of the claims. Vegetation consists of spruce, pine and alder at lower elevations along Limpoke Creek and typical sub-alpine to alpine shrub cover above 1100 meters.



<b>HOMESTAKE</b> <b>MINERAL DEVELOPMENT COMPANY</b>			
<b>GRAND CANYON PROJECT, B.C.</b> <b>LIMPOKE</b> <b>(GRAN 11, CANYON 82)</b>			
<b>LOCATION MAP</b>			
<b>DRAWN</b> KMc	<b>DATE</b> 11/87	<b>FILE CODE</b> 104G	<b>FIGURE 1.1</b>
Revised _____			



28 29 30 31

SCALE 1:50,000

HOMESTAKE  
MINERAL DEVELOPMENT COMPANY



LIMPOKE (GRAN 11, CANYON 82)

DETAILED CLAIM LOCATION

DRAWN P.H.	DATE Aug, 10, 89	FILE CODE 1046/13	Fig. 2.2
Revised _____			

### 1.3 ACCESS

Access to the property is via helicopter from Telegraph Creek, which is connected to Dease Lake by an all-weather road and serviced by fixed wing flights from Smithers, B.C. The Stikine River provides navigable water access from Wrangell, Alaska north to Telegraph Creek. A gravel airstrip capable of handling aircraft as large as DC-3's is located at the Galore Creek camp just south of the Scud River.

### 2.0 CLAIM STATUS

The Limpoke Creek property consists of two mineral claims totalling thirty - eight units. The claims were recorded on June 14 and August 3, 1988 and are owned by Homestake Mineral Development Company and Equity Silver Mines Ltd. Current claim data is as follows:

CLAIM	UNITS	RECORD#	RECORD	EXPIRY
Gran 11	18	4668	06/14/88	06/14/90
Canyon 82	20	4996	08/03/88	08/03/90

### 3.0 EXPLORATION HISTORY

Previous work in the vicinity of the property dates back to the 1920's with the discovery and investigation of several copper-molybdenum showings. Kennco Explorations Ltd. conducted a program of soil sampling, an IP survey and diamond drilling in the vicinity of the Poke showing (minfile 104G 001) in 1963, and prospecting and geochemical sampling on the Gordon showing ( minfile 104G 002) in 1966.

Dupont staked the Bar claims in 1980 on the basis of anomalous gold in a regional stream sediment survey and conducted follow up geological mapping and soil sampling the same year ( B.C. Assessment Report #9193). These claims overlap the Canyon 82 and Gran 11 claims.

The Limp#2 claim was staked in March, 1980 by Teck Explorations Ltd. and a soil geochemistry survey was conducted in July, 1988 (B.C. Assessment Report #9092). The claim overlapped the southeast portion of Canyon 82.

### 4.0 REGIONAL GEOLOGY

The property lies on the boundary between the Coast Plutonic Complex and Intermontane Belts and is underlain by rocks of the Stikine terrane. The terrane in this area can be divided into four tectonostratigraphic packages: a Late Palaeozoic to Middle Jurassic island arc suite represented by the Stikine assemblage of Monger (1977) and the Stuhini Group (Kerr, 1948); Middle Jurassic to early Late Cretaceous successor-basin sediments of the Bowser Lake



132°00' 45' 30' 15' 131°00'  
58°00'





Group (Tipper and Richards, 1976); Late Cretaceous to Tertiary volcanic arc assemblages of the Sloko Group (Aiken, 1959); and Late Tertiary to Recent post - orogenic plateau basalts of the Edziza and Spectrum Ranges.

Three stages of plutonism are recognized in the area. The Hickman batholith is composed of Early to Middle Triassic quartz monzonite to quartz diorite. The Yehiniko and Galore Creek Intrusions are composed of quartz diorite to syenite of Early to Middle Jurassic age. Numerous dykes and sills of monzonite to diorite of Tertiary age occur throughout the project area.

These rocks have undergone multiple stages of deformation, forming a complex structural pattern which is complicated by large differences in the competence of the different units. North and northwest trending normal faults are dominant and are cut by narrow west - trending extensional faults (Souther, 1972).

## 5.0 PROPERTY GEOLOGY

The property is underlain by andesitic volcanic rocks of the Upper Triassic Stuhini Group. These rocks are locally intruded by dikes and plugs of Jurassic/Cretaceous granodiorite and quartz diorite. A large intrusion of this type lies immediately south of the property, north of Mount Barrington. A small body of syenite of unknown dimension has been noted in the southwestern corner of the Canyon 82 claim.

## 6.0 EXPLORATION PROGRAM AND RESULTS

### 6.1 GEOLOGY AND LITHOGEOCHEMICAL SAMPLING

Mapping and sampling of the property was made difficult by the steep cliffs and heavy talus cover on the north side of Limpoke Creek, however, all major drainages and ridges in the claim area were prospected and areas of alteration or mineralization were evaluated in greater detail. All lithologies, structures and sample locations are plotted on 1:10,000 scale base maps (Figure 4). During the course of this program, a total of twelve rock samples were collected from areas of alteration or mineralization.

The work completed during this program was completed as a follow up of work done during June of 1989 ( B.C. Assessment Report #19056).

#### 6.1.1 Results and Interpretations

The property is predominantly underlain by mafic volcanic rocks of the Upper Triassic Stuhini Group. The volcanics are typically dark green, fine grained and massive. In several locations the rocks are intensely altered to carbonate but no anomalous gold values were detected (Samples 31717 and 31718). A syenite intrusive was located along the southwestern corner of the Canyon 82 claim but contains no significant alteration or mineralization.

A swarm of pyritic felsic dykes occurs along the north boundary of the Gran 11 claim. The dykes, which trend 020° to 050° average approximately 4 meters in width and stand out as substantial gossan zones in the cliffs. The dykes are probably genetically related to the large granodiorite stock located on the south side of Limpoke Creek. Locally, the pyritic felsic dykes are cut and sheared by a major fault structure trending 020° and dipping sub vertically. The fault hosts wide zones of pyritic clay gouge. Analytical results from both the fault zone and the felsic dykes are summarized in the table below.

SAMPLE NO	Au (ppb)	Ag (ppm)	Cu (ppm)
31711	71	0.4	51
31712	348	3.9	203
31713	64	2.3	230

The source of two samples of quartz vein float from the gravels of Limpoke Creek was not located. The first sample, 31010, is quartz vein material, hosting 1% galena, 5% pyrite and 5% tetrahedrite. Geochemical analysis of this sample returned results of 400 ppb gold, 171 ppm copper, 6.7 ppm silver and 426 ppm lead. The second quartz vein float sample, 31179, contained semi-massive pyrite and returned 26,200 ppb gold, 207 ppm copper and 291 ppm tungsten. The discovery of similar boulders further upstream near the head of Limpoke Creek implies a source near or under the glacier at the head of Limpoke valley.

## 8.0 REFERENCES

Allen, D.G., Panteleyev, A. and Armstrong, A.T. (1976) "Galore Creek" in Porphyry Deposits of the Canadian Cordillera, Special Volume 15, pg. 402 - 417.

B.C. Ministry of Mines, Assessment Reports # 253, 592, 847, 1893, 3029, 3846, 3847, 4717, 5097, 5509, 6010, 7708, 9193, 9202, 9617, 11316, 19056 to 19079.

Brown, D.A. and Gunning, M. (1989): "Geology of the Stikine River Area, Northwestern B.C.", B.C. Ministry of Energy, Mines and Petroleum Resources, Geological Field Work, 1988, Paper 1989-1, pp. 251-267.

Holbek, P.M. (1988): "Geology and Mineralization of the Stikine Assemblage, Mess Creek Area, Northwestern British Columbia.", University of British Columbia MSc thesis.

Kerr, F.A. (1948): "Lower Stikine and Western Iskut River Areas, B.C.", GSC Memoir 246.

Logan, J.M. and Koyanagi, V.M. (1989): "Geology and Mineral Deposits of the Galore Creek Area, Northwestern B.C.", B.C. Ministry of Energy, Mines and Petroleum Resources, Geological Field Work, 1988, Paper 1989-1, pp. 269-284.

Ministry of Mines Annual Reports;	1930, pg 118, 119
	1931, pg 50
	1958, pg 6
	1963, pg 7
	1966, pg 22, 24
	1968, pg 38

Ney, C.S. and Hollister, V.F. (1976): "Geological Setting of Porphyry Deposits of the Canadian Cordillera" in Porphyry Deposits of the Canadian Cordillera, Special Volume 15, pg 21 - 30

Souther, J.G. (1972): "Telegraph Creek Map Area, B.C.", GSC Paper 71-44.

**APPENDIX I**

**(Sample Descriptions)**

LINPOKE CREEK (GRAN 11 AND CANYON 82)

SAMPLE	NO	TYPE	DESCRIPTION	MINERALIZATION
LC-11	31659	1.3m chip	shear/fault, clay gouge	trace py
	31711	grab	bleached mafic volcanic in shear zone	1 to 5% diss py
	31712	grab	silicified mafic volcanic in gossanous shear	1 to 3% py
	31713	grab	gossanous felsic dyke	1 to 5% py
	31714	grab	felsic dyke	trace py
	31715	grab	shear zone-clay gouge	2 to 5% f.g. diss py
	31716	grab	felsic dyke - trend 070	trace f.g. diss. py
	31717	grab	mafic volcanic with carbonate stringers	Trace to 2% diss py
LC-82	31718	grab	ankeritic alteration zone with quartz stringers	
	31719	grab	carbonatized felsic dyke	
LC-FH	31976	grab	quartz-pyrite stringers in mafic volcs.	massive py to 1cm

**APPENDIX II**

**(Sample Results)**

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SAMPLE NUMBER	ELEMENT UNITS	Ga PPM	La PPM	Li PPM	No PPM	Nb PPM	Ni PPM	Pb PPM	Rb PPM	Sb PPM	Sc PPM	Sn PPM
T1 LC-FA-3 31692		18	9	15	8	4	39	<2	42	7	7	<20
R2 LC-FA-1 31690		20	2	11	14	8	10	<2	100	6	10	<20
R2 LC-FA-1 31691		12	1	4	3	9	15	3	42	<5	1	<20
R2 LC-FA-1 31977		13	33	6	25	8	25	2	37	8	3	<20
R2 LC-FA-1 31978		136	4	10	<1	69	22	83	<20	62	7	23
R2 LC-FA-1 31979		17	9	13	5	6	12	12	77	7	5	<20
R2 LC-FH-1 31660		20	8	10	8	11	45	4	66	11	13	<20
R2 LC-FH-1 31693		7	14	6	4	17	22	4	71	12	14	<20
R2 LC-FH-1 31694		9	5	3	2	15	16	6	40	13	8	<20
R2 LC-FH-1 31695		4	6	2	6	6	8	160	110	88	2	<20
R2 LC-FH-1 31972		8	11	5	2	4	45	27	31	9	1	<20
R2 LC-FH-1 31973		3	6	3	2	22	21	4	62	30	5	<20
R2 LC-FH-1 31974		<2	6	6	4	18	22	<2	62	15	12	<20
R2 LC-FH-1 31975		16	4	3	1	21	3	22	21	20	1	<20
R2 LC-FH-1 31976		20	2	4	4	18	83	18	<20	31	17	<20
R2 LC-11-1 31659		5	<1	6	2	32	8	22	<20	25	6	<20
R2 LC-11-1 31711		26	4	4	14	8	11	28	<20	24	6	<20
R2 LC-11-1 31712		31	4	8	7	8	6	30	<20	24	13	<20
R2 LC-11-1 31713		20	<1	2	116	5	<1	25	<20	22	4	<20
R2 LC-11-1 31714		28	18	4	4	13	5	31	<20	20	3	<20
R2 LC-11-1 31715		29	24	3	14	13	6	31	<20	21	6	<20
R2 LC-11-1 31716		30	16	4	2	15	5	26	<20	20	1	<20
R2 LC-11-1 31717		36	<1	24	2	10	32	9	<20	25	15	<20
R2 LC-82-1 31709		24	7	2	<1	10	2	68	<20	19	<1	<20
R2 LC-82-1 31710		<2	<1	4	<1	39	4	23	<20	29	2	<20
R2 LC-82-1 31718		34	5	11	1	15	24	17	<20	29	13	<20
R2 LC-82-1 31719		20	<1	6	1	28	14	22	<20	32	3	<20



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SAMPLE NUMBER	ELEMENT UNITS	Ga PPM	La PPM	Li PPM	Mo PPM	Nb PPM	Ni PPM	Pb PPM	Rb PPM	Sb PPM	Sc PPM	Sn PPM
T1 LC-FA-3 31692		18	9	15	8	4	39	<2	42	7	7	<20
R2 LC-FA-1 31690		20	2	11	14	8	10	<2	100	6	10	<20
R2 LC-FA-1 31691		12	1	4	3	9	15	3	42	<5	1	<20
R2 LC-FA-1 31977		13	33	6	25	8	25	2	37	8	3	<20
R2 LC-FA-1 31978		136	4	10	<1	69	22	83	<20	62	7	23
R2 LC-FA-1 31979		17	9	13	5	6	12	12	77	7	5	<20
R2 LC-FH-1 31660		20	8	10	8	11	45	4	66	11	13	<20
R2 LC-FH-1 31693		7	14	6	4	17	22	4	71	12	14	<20
R2 LC-FH-1 31694		9	5	3	2	15	16	6	40	13	8	<20
R2 LC-FH-1 31695		4	6	2	6	6	8	160	110	88	2	<20
R2 LC-FH-1 31972		8	11	5	2	4	45	27	31	9	1	<20
R2 LC-FH-1 31973		3	6	3	2	22	21	4	62	30	5	<20
R2 LC-FH-1 31974		<2	6	6	4	18	22	<2	62	15	12	<20
R2 LC-FH-1 31975		16	4	3	1	21	3	22	21	20	1	<20
R2 LC-FH-1 31976		20	2	4	4	18	83	18	<20	31	17	<20
R2 LC-11-1 31659		5	<1	6	2	32	8	22	<20	25	6	<20
R2 LC-11-1 31711		26	4	4	14	8	11	28	<20	24	6	<20
R2 LC-11-1 31712		31	4	8	7	8	6	30	<20	24	13	<20
R2 LC-11-1 31713		20	<1	2	116	5	<1	25	<20	22	4	<20
R2 LC-11-1 31714		28	18	4	4	13	5	31	<20	20	3	<20
R2 LC-11-1 31715		29	24	3	14	13	6	31	<20	21	6	<20
R2 LC-11-1 31716		30	16	4	2	15	5	26	<20	20	1	<20
R2 LC-11-1 31717		36	<1	24	2	10	32	9	<20	25	15	<20
R2 LC-82-1 31709		24	7	2	<1	10	2	68	<20	19	<1	<20
R2 LC-82-1 31710		<2	<1	4	<1	39	4	23	<20	29	2	<20
R2 LC-82-1 31718		34	5	11	1	15	24	17	<20	29	13	<20
R2 LC-82-1 31719		20	<1	6	1	28	14	22	<20	32	3	<20

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PAGE 1C

SAMPLE NUMBER	ELEMENT UNITS	Sr PPM	Ta PPM	Te PPM	V PPM	W PPM	Y PPM	Zn PPM	Zr PPM
T1 LC-FA-3 31692		43	<10	<10	206	<10	9	126	4
R2 LC-FA-1 31690		112	<10	<10	214	<10	10	27	15
R2 LC-FA-1 31691		56	<10	<10	26	<10	4	9	1
R2 LC-FA-1 31977		107	<10	<10	126	<10	10	29	15
R2 LC-FA-1 31978		150	27	97	54	33	13	69	5
R2 LC-FA-1 31979		135	13	10	145	<10	11	58	5
R2 LC-FH-1 31660		178	10	14	177	<10	11	184	15
R2 LC-FH-1 31693		282	14	16	164	<10	23	147	1
R2 LC-FH-1 31694		551	11	13	88	<10	9	104	2
R2 LC-FH-1 31695		160	44	13	12	<10	3	3715	3
R2 LC-FH-1 31972		31	<10	<10	13	<10	2	83	<1
R2 LC-FH-1 31973		561	16	25	26	<10	12	62	1
R2 LC-FH-1 31974		184	12	10	107	<10	11	75	1
R2 LC-FH-1 31975		283	11	29	1	<10	8	21	4
R2 LC-FH-1 31976		378	26	24	88	<10	8	54	2
R2 LC-11-1 31659		188	<10	29	51	<10	5	23	1
R2 LC-11-1 31711		82	17	21	161	<10	2	22	4
R2 LC-11-1 31712		20	21	31	231	<10	5	296	9
R2 LC-11-1 31713		25	12	16	174	<10	<1	204	5
R2 LC-11-1 31714		79	<10	22	66	<10	3	38	5
R2 LC-11-1 31715		42	<10	24	81	<10	5	82	12
R2 LC-11-1 31716		68	<10	24	55	<10	4	46	6
R2 LC-11-1 31717		28	<10	28	231	<10	11	83	27
R2 LC-82-1 31709		48	<10	25	15	<10	2	260	11
R2 LC-82-1 31710		3761	<10	33	11	<10	12	18	1
R2 LC-82-1 31718		140	<10	31	121	<10	10	66	2
R2 LC-82-1 31719		218	<10	39	41	<10	5	67	<1

**APPENDIX III**

**(Sample Methods)**

## SAMPLING METHODS

### Rock

Approximately one to two kilograms were collected with a rock hammer with care being taken to sample as much unweathered material as possible. The sample was placed in a 3 mil plastic sample bag and shipped to Acme Analytical Labs or Bondar-Clegg & Company for 30 element ICP and geochemical analysis of gold.

### Stream Silt

The samples were collected with a hand trowel or by hand and placed in kraft sample bags, air dried and shipped to Acme Analytical Lab or Bondar-Clegg and Company for analysis of 30 elements by ICP and gold by geochemistry.

### Heavy Mineral

Stream sediment was sieved through a 20 mesh screen and collected in large 3 mil plastic sample bags. A standard sample weight of 8 kilograms was used. The samples were shipped to C.F. Mineral Research Ltd. of Kelowna, B.C. for heavy mineral and magnetic separation of the -150 mesh and 150-60 mesh fractions. The heavy non-magnetic fractions were then shipped to Acme Analytical Labs for analysis by 30 element ICP and gold by fire assay. A portion of each sample was retained and sent to Acme where it was analyzed in the same manner as the stream sediment samples.

### Soil Samples

Samples were collected from the B horizon using a maddock, placed in kraft paper bags and air dried. The samples were shipped to Acme Analytical Labs or Bondar-Clegg and Company where they were analyzed by 30 element ICP and geochemical gold.

In all instances, sample locations were marked in the field with orange flagging tape and metal tags bearing the sample number, date and samplers name.

**APPENDIX IV**  
**(Analytical Methods)**



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## Determination of Elements by Plasma Emission Spectroscopy

### Lefort Aqua-regia Digestion

The samples of 0.5 grams in weight are digested in test tubes with concentrated nitric and hydrochloric acids. These tubes are heated in hot water baths for two and one-half hours. The sample is then diluted and mixed. This solution is analyzed on the Plasma Emission Spectrograph by using the appropriate emission line for each element. The emissions are compared to standard solutions to determine the amount of each element that is present.

### Multi-acid Digestion

A sample weight of 0.5 grams is transferred to a teflon test tube. It is then treated with a mixture of hydrofluoric, nitric and perchloric acids. The sample and acid mixture is heated in an aluminum block until the volume is reduced and there are strong perchloric fumes. The residue is dissolved with hydrochloric acid and the solution is then diluted to 20 ml. with demineralized water and mixed. These solutions are analyzed on the Plasma Emission Spectrograph using the appropriate emission line for each element. The emissions are compared to standard solutions to determine the amount of each element that is present. These are run within one hour of digestion in order to minimize precipitation problems.

### Contamination Prevention

The test tubes are used for DC Plasma analysis only and are discarded after use. A solution of de-ionized water or dilute acid is run between samples to prevent contamination during analysis.



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## PROCEDURE FOR ASSAY Au ANALYSIS

### FIRE ASSAY PROCEDURE:

A prepared sample of one assay ton (29.166 grams) is mixed with a flux which is composed mainly of lead oxide. The proportions of the flux components (the litharge, soda, silica, borax glass, and flour) are adjusted depending upon the nature of the sample. Silver is added to help collect the gold. The samples are fused at 1950 F until a clear melt is obtained. The 30-40 gram lead button that is produced contains the precious metals. It is then separated from the slag. Heating in the cupellation furnace separates the lead from the noble metals. The normal-sized precious metal beads that are produced are transferred to test tubes and dissolved with aqua-regia. This solution is analyzed using Atomic Absorption by comparing the absorbance of these solutions with that of standard solutions. In the case of high grade samples, greater than 0.200 OPT, the precious metal bead is parted in dilute HNO<sub>3</sub> acid to dissolve the silver and the remaining gold is weighed.

### COMMENTS:

As part of our routine quality control we run a duplicate analysis for 2 out of each batch of 24 as well as a standard. These total about 12% of the samples. Also, all samples which are over 0.20 OPT on the original fusion are run again to verify the results. If a sample gives erratic results, such as 0.10, 0.020, 0.30, we will indicate this on the report. We suggest that a new split should be taken from the reject for preparation and analysis by our metallics sieve procedure. Certified standards and in house pulp standards as well as synthetic solution standards are run with each report or batch of samples.

## PROCEDURE FOR FIRE ASSAY SILVER

- 1) One assay ton (29.16 grams) of homogeneous pulp is weighed into a fireclay crucible and fluxed appropriately with litharge, borax, soda ash and silica.
- 2) No inquant is added, only flour or niter to control button size.
- 3) Fusion takes place in a furnace of about 1900 degrees F. The same procedure is used for fusing gold.
- 4) A standard for silver is run with each silver fusion.
- 5) All buttons are made up to the same weight with silver-free lead foil.
- 6) Controlled temperatures and a watchful cupeller ensure minimal silver losses in cupellation.
- 7) Corrections are applied to final results based on checks and standards.





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V7H 2R5  
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#### SILVER DETERMINATION (WET ASSAY)

A 3.0 gm sample is analytically weighed into a beaker. It is digested with hot nitric, hydrochloric, and hydrofluoric acids which breaks down the ore. Once digested, the sample is boiled in a dilute acid solution, transferred to a flask, and carefully diluted to exactly 100 mls. The samples are analyzed on the atomic absorption unit along with certified standards, in house standards and duplicates.

Total CU, PB, ZN, FE, NI, Cd, Co BY A.A.

A 0.5 gram sample is weighed into a beaker and digested with HNO<sub>3</sub>, HCl, and HF on a hotplate. The sample is taken down to dryness and then HCl is added with water and KClO<sub>3</sub> to boil the sample into solution. The sample is then run on the atomic absorption unit along with pulp standards and synthetic standards. Any sample over 10% will be rerun by titration methods.

**APPENDIX V**

**(Statement of Qualifications)**

## STATEMENT OF QUALIFICATIONS

I, Darcy Edward Marud, of 2205 Graveley Street, Vancouver, British Columbia, Canada, hereby certify that:

1. I am a graduate of the University of Saskatchewan, having been granted the degree of Bachelor of Sciences - Honours degree in Geology in 1985.
2. I have practiced my profession as a geologist in mineral exploration since 1985.
3. I am presently employed as a geologist with Homestake Mineral Development Company of #1000 - 700 West Pender Street, Vancouver, British Columbia.
4. The work done in the accompanying report was done under my supervision and with my participation.
5. I am the author/co-author of the above report.
6. I have no direct or indirect financial interest in any companies known by me to have an interest in the mineral properties described by this report, nor do I expect to receive any such interest.

Dated at Vancouver, B.C. this 6<sup>th</sup> day of July, 1990.

Respectfully submitted

  
Darcy E. Marud

**APPENDIX VI**  
**(Statement of Costs)**

LIMPOKE CREEK

1.0 SALARIES AND WAGES

Project Geologist	6.5 days	@	250/day	1625
Geologist	13 days	@	180/day	2340
Assistant	7 days	@	130/day	910

4875

2.0 GEOCHEMISTRY AND ASSAYING

Geochemistry	12 rock	@	17.50/sp1	210
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210

3.0 ADMINISTRATION

Travel expenses and airfare				400
Maps, publications and photos				100
Communications				20
Freight and shipping				50

570

4.0 SURFACE WORK

Accomodation				1487.5
Field Materials				100
Air Support	9.1 hrs	@	655/hr	5960.5

7548

5.0 MACHINERY AND EXPENSES

Rentals - Motorola radios				20
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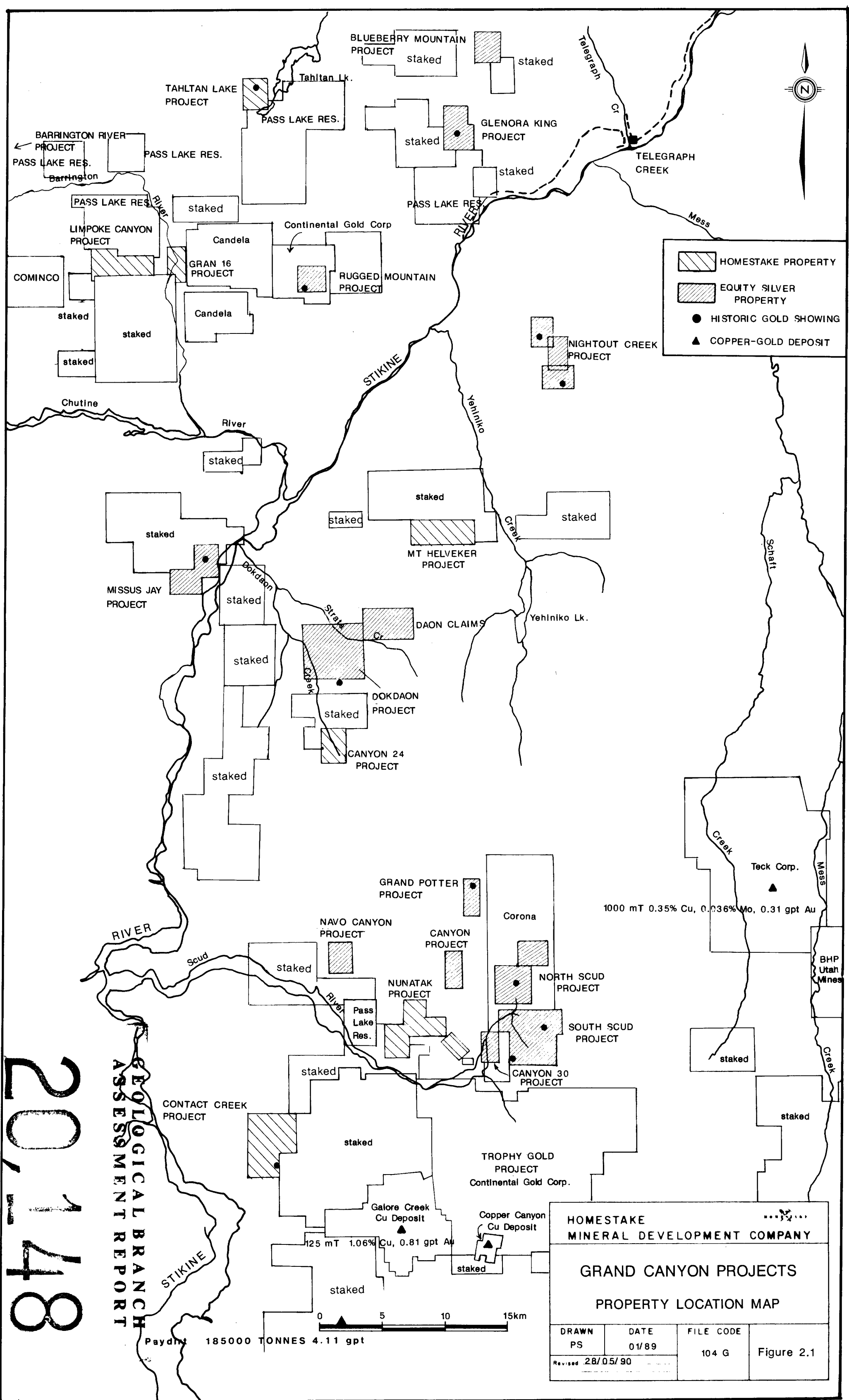
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**TOTAL**

**13215**

20,148

GEOLOGICAL BRANCH  
ASSESSMENT REPORT

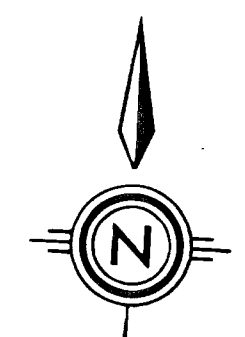
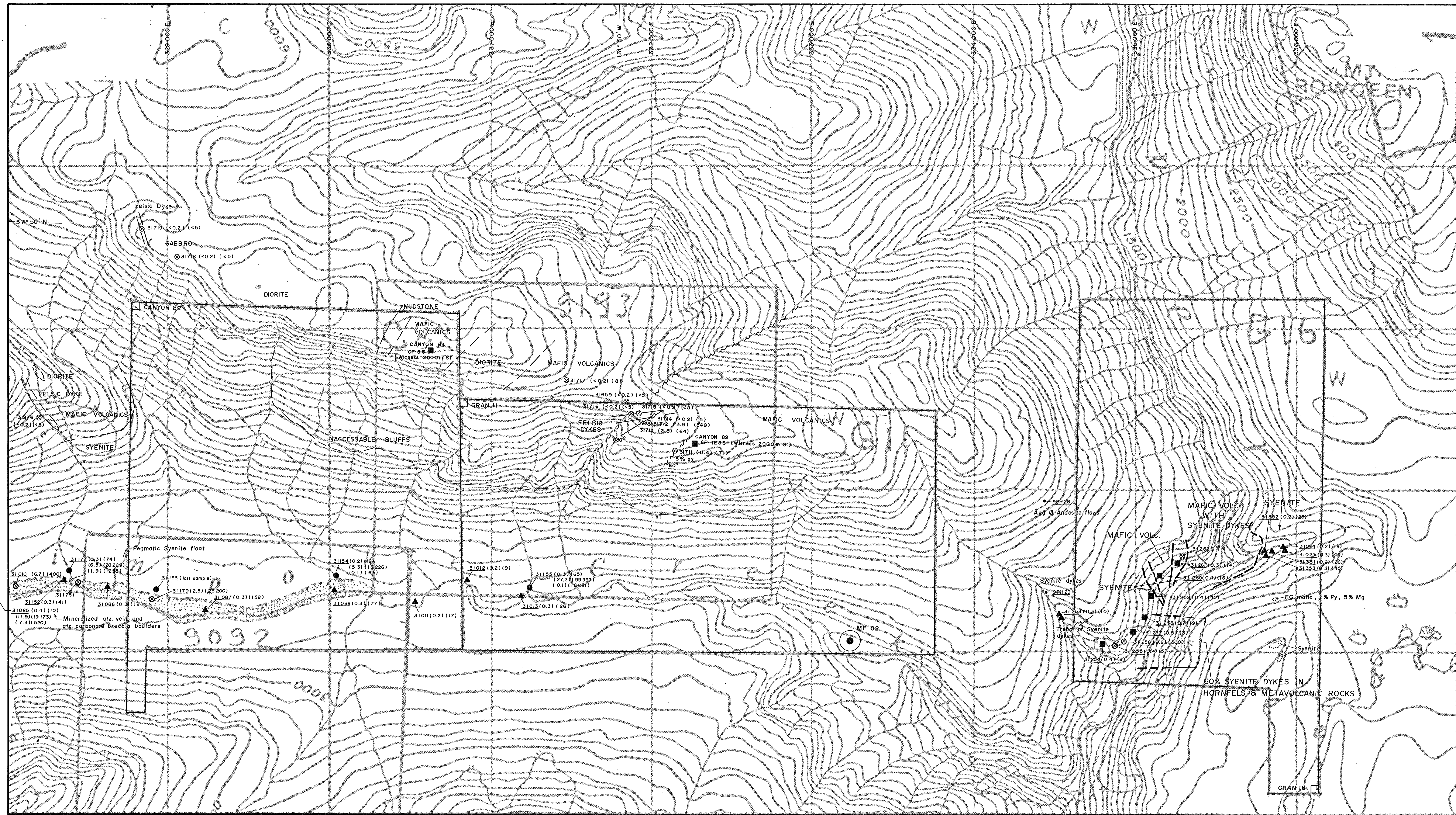


Paydirt 185000 TONNES 4.11 gpt



HOMESTAKE MINERAL DEVELOPMENT COMPANY			
GRAND CANYON PROJECTS			
PROPERTY LOCATION MAP			
DRAWN PS	DATE 01/89	FILE CODE 104 G	Figure 2.1
Revised 28/05/90			





**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**20,148**

**LEGEND**

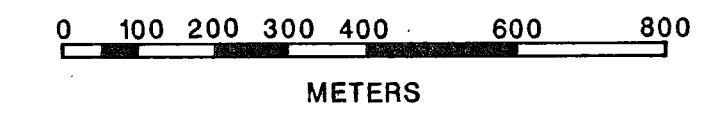
- ⊗ Rock Sample
- ▲ Silt
- Soil
- Heavy Mineral
- Mapping Station
- Geological Contact/Limit of Outcrops
- ||||| Fault
- Outcrop

**CURRENT WORK PREVIOUS WORK**  
*Ag ppm Au ppm Ag ppm Au ppm*

- ⊗ 31395 (0.5) (93) ⊗ 31395 (0.5) (93)  
Sample Number Sample Number  
Sample Site Sample Site
- 31395 (0.5) (93)  
(1000) (10000) Heavy Mineral - 150 mesh  
(500) (2000) Heavy Mineral - 60 + 150 mesh

- Py Pyrite
- Po/Pr Pyrrhotite
- Mg/Mag Magnetite
- qtz vn Quartz Vein
- Sil Silicified
- EP Epidote
- Bi Biotite
- cp Chalcopyrite
- F.G Fine Grained
- Minifine Occurrence

SCALE 1:10,000



<b>HOMESTAKE MINERAL DEVELOPMENT COMPANY</b>			
<b>LIMPOKE CANYON PROPERTY</b>			
B.C. (GRAN 16)			
<b>GEOLOGY AND SAMPLE LOCATIONS</b>			
DRAWN P.H.	DATE JULY 25, 1989	FILE CODE 104 G/13	Fig 4