1753

COPPER CREEK MERCURY PROPERTY

SAVONA, B. C.

N.T.S. 92-I-15

The Copper Creek Mercury property is located less than 1 mile north of the C. N. R. right of way overlooking the north shore of Kamloops Lake. Copper Creek station is approximately 21 miles west-northwest of Kamloops (Fig. 1).

The property as presented by Messrs. Burr and Mullin of Princeton, B. C. consisted of the following:

(a) Mineral Lease M-34R (8 individual lots)
(b) Crown Grant L-930
(c) Located claims Ed 1 - 4.

The group Ed 1 - 4 (Record 63533-6) was recorded in Kamloops on April 3rd, 1967, but because of apparent over-staking is indicated to have been staked in contravention of section 12 (I) of the Mining Act. A copy of the mineral claim map of the area is included with this report (Fig. 2).

Mercury mineralization occurs sporadically in a north-northwesterly trending zone passing through the western end of Kamloops Lake. The deposits occur predominantly in volcanic rocks of Mesozoic and Tertiary age and are accompanied in some instances by silicification with chalcedonic quartz, intense alteration of the rock to ankeritic carbonates, and the development of dolomite veins or stringers in shear and fracture zones. The mercury bearing mineral is cinnabar.

The Copper Creek showings have been known since the last decade of the 1800's and the first development began in 1894. The major production from the property occurred at this time, the amount recovered being 100 flasks. A further production of 5 flasks is recorded for the 1920's. The total production for the property reported by the B. C. Department of Mines is given as 143 flasks. The balance of this production occurred during the Second World War years, activity at this time being concentrated in the Northern group of workings.

Production from the Copper Creek property is, by far, the greatest from any property in the Kamloops Mercury Belt.

To 1927: B.C.D.M. Bull. 5, p. 37 when Cating.

GEOLOGY

The rocks in the Copper Creek area consist of sediments and volcanics of Mesozoic and Tertiary age. The oldest rocks of Upper Triassic age form part of the Nicola Group of volcanics and less extensive sediments. A series of conglomerates, sandstones and shales forming Eagle Hill immediately northwest of Copper Creek station are overlain by a series of andesites, basalts and fragmental rocks exposed in the lower slope of the Carabine (Copper) Creek valley which drains into Kamloops Lake. Both the Eagle Hill sediments and Carabine Creek volcanics are intruded by granitic Copper Creek intrusions forming small plugs with a maximum surface outcrop of one mile. These sediments, volcanics and intrusives are all of late Cretaceous or early Tertiary age.

Overlying the Triassic, late Cretaceous and early Tertiary rocks are a series of rhyolites, andesite, basalts and associated tuffs of possible Miocene age. This Kamloops Group is of wide extent capping several of the highest peaks and outcrops over a large area to the northeast of Copper Creek.

Mercury mineralization occurs in all the pre-Miocene rocks described. On the Copper Creek property the host rocks are volcanics of early Tertiary age.

The volcanics are predominantly basic lavas and tuffs varying in composition from basaltic through ultrabasic. They are locally considerably altered and fractured. Dolomitic and dolomite-quartz veining is common. The veins strike irregularly and vary in width from 4 feet to narrow stringers. The larger veins are predominantly dolomitic. Chalcedonic quartz is more common in the narrower veins, and, from the relationships, was introduced later than the dolomite.

Cinnabar occurs associated with the dolomite and dolomite-quartz veining. The sulphide also occurs in shear zones and fractures in the country rock. The most commonly associated metallic minerals are tetrahedrite and stibnite and in many of the old workings, mild malachite staining is prominent. The occurrence of cinnabar is sporadic, and the quantity along any structure is, in no way related to the size, direction or nature of the vein or fracture in which it is contained. Good hand specimens, containing up to 20% HgS in sheared volcanics may be found on the dumps of some of the old workings. However, a more

common distribution consists of small specks and crystals usually near the margins of the dolomite and quartz veins or as small areas of cinnabar paint along fracture zones.

The variability of the strike of veins, fractures and shears can be seen in Fig. 3. The dominant strike direction in the Northern workings is N 20 - 40° E; in the Central workings N 15 - 30° W and in the South workings N 45° E. Veins, stringers and fractures in all workings are extremely irregular in strike and dip and locally stockwork patterns are developed.

Although Cockfield (G. S. C. Memoir 249) records that the host rocks of the cinnabar mineralization do include sediments, he notes that the occurrences are mainly confined to the volcanics. All the cinnabar bearing veins and structures mapped in Fig. 3 occur in tuffs, porphyritic and non-porphyritic volcanics and volcanic breccias of basic to ultrabasic composition. Float of the older sedimentary conglomerates is common in the mineralized areas but outcrops of this rock are found on higher ground to the west. Younger basic dykes, commonly following major shears, cut the volcanics containing the mineralization.

RECENT EXPLORATION

Between May 7th and 27th, 1967, the Copper Creek workings were mapped and sampled. The geological mapping was done using a tape and Brunton compass. Rock samples were collected from old workings and from four bulldozer trenches which were excavated while the examination was in progress. In all, a total of 158 rock samples were collected and analysed for mercury. Selected samples were also analysed for gold and silver.

The geological map of the Copper Creek property is reproduced in Fig. 3. Figs. 4 and 5 cover parts of the area on an enlarged scale and show sample locations and values.

A geochemical soil traverse upslope and across the strike of the veins in the Central workings was also sampled and determinations for copper and mercury were made by the Rocky Mountain Geochemical Corporation, Salt Lake City. Results for mercury in surface samples are shown in Fig. 2.

RESULTS OF SAMPLING

(a) Geochemical Sampling

The geochemical traverse was sampled in an area of juvenile soils immediately upslope of the Upper Trench and across the strike of the projected dominant vein direction in the Central workings (Fig. 4). These soils are essentially residual, but have been subjected to the influence of gravity on the steep slope. The overburden thickness varies from nothing in outcrop areas to 4 feet. Further downslope the maximum thickness increases due to accumulation of talus.

The contrast in mercury values varies from 120 ppb.* to over 2000 ppb. The highest values occur at the southwest end of the trench and are not correlatable with small veins and shear zones mapped elsewhere along the trench. Gravity has undoubtedly affected the soil profiles and it is very likely that the higher values are related to anomalous sources lying upslope. The source of the + 2000 ppb. values at the southwest end of the traverse is apparently the bedrock zone sampled in the trench assaying 0.033% Hg. A geochemical profile over this zone is as follows:-

0 - 12"	1390 ppb. Hg
12 - 24"	1570 ppb. Hg
24 - 36"	+2000 ppb. Hg
(Bedrock at 36")	

The mercury content of the thin soil overlying a two inch vein assaying 0.187% Hg is low, but over another vein 35 feet to the northeast near bedrock values exceed 2000 ppb. beneath a surface value of 690 ppb.

The geochemical contrast in Hg values indicates that distinct Hg anomalies are present in the juvenile soils in this environment. However, a careful coverage is necessary to outline the position of suboutcropping mercury mineralization because of gravitational movement. The most straightforward survey would include surface sampling (6 - 12") followed by profile sampling in anomalous zones.

* ppb. -- parts per billion

The juvenile soils are thinnest on the upper steeper slopes. The relatively dry climate of the Kamloops area tends to promote the dispersion of mercury in the vapour state. Because of this, anomalous indications of mercury in surface overburden can be anticipated in areas of moderate transported cover. Profile sampling will be necessary, however, to distinguish anomalies caused by mineralized talus and suboutcropping mineralized bedrock.

Lacustrine and fluvial gravels of glacial origin are characteristic overburden cover on the terraces bordering the major valleys in the Kamloops area and also in the valleys of the numerous tributaries. The terraces are conspicuous because of the level topography, contrasting with the humocky topography in the lower tributary valleys. These truly transported soils are readily distinguishable from the juvenile soils by their content of rounded and smoothed, glacially transported pebbles and boulders. In areas having a moderate thickness of transported overburden geochemical anomalies for mercury can be anticipated in surface soils overlying higher grade mineralized zones. Where this overburden cover exceeds 25 - 30 feet anomalies in surface soils are less likely to occur.

The highest copper values along the geochemical traverse occur over the two mapped veins. Tetrahedrite is conspicuous in the southwesterly of these veins. Highest copper values are 170 ppm. compared with background values in the range 60 - 80 ppm. copper. High copper and mercury values along this traverse do not coincide. Because of the different chemical characteristics of copper and mercury, copper anomalies in surface soils overlying suboutcropping mineralization can only be anticipated in relatively shallow transported and talus overburden.

(b) Rock Sampling

Chip-channel rock samples varying in length from 4 feet to 32 feet were collected in the Central and South workings and from four bulldozer trenches in the vicinity of these workings - (a) Upper Trench; (b) Downhill Trench; (c) Southwest Trench; (d) Lower Trench. The positions of these samples and their mercury content are shown in Figs. 4 and 5.

Fig. 4 covers the Central workings and the Upper and Downhill trenches. The mercury content of the channel samples varies from 0.006% to 0.180% mercury. The majority of the samples in the Central workings were collected over a length of 6 feet, and the average content of all the samples from these workings is

0.038% mercury. Not counting the two highest values of 0.180% mercury and 0.149% mercury, the average of the remaining samples is 0.0335% mercury. This is equivalent to 0.67 lbs/Hg/ton. The average mercury content of the channel samples in the Upper Trench is 0.0137% mercury or 0.27 lbs/Hg/ton.

An assay of 0.192% mercury over 6 feet crosses one of the more heavily stoped vein structures in the South workings. When the strike of this zone is projected to intersect the Southwest Trench assays of 0.055% mercury and 0.041% mercury (each over 10 feet) are recorded in a zone 130 feet long averaging 0.025% mercury. No major structures correlatable with the higher assays were noted, although numerous smaller faults are common.

In the Lower Trench, the southwesterly 120 feet sampled returns an average assay of 0.024% mercury. A similar grade (0.025% mercury) occurs in 100 feet exposed in the northeasterly extremity of the trench. The overall grade for all the exposures in the Lower Trench is 0.0207% mercury over 310 feet (Fig. 5).

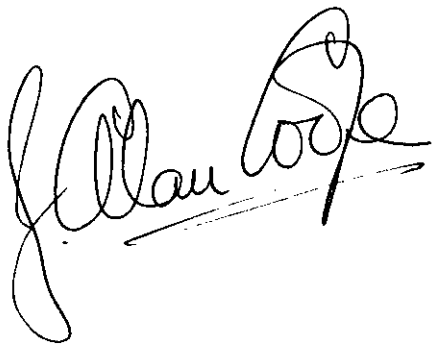
The sampling that has been completed indicates that although cinnabar mineralization tends to be locally concentrated along well defined veins and structures, mercury is broadly distributed through the volcanic rocks with zones in excess of 100 feet containing an average of approximately ½ lb Hg/ton. In the more strongly veined and fractured zones (eg: Central workings) average assays increase to approximately 2/3 lb. Hg/ton. Due to the irregularity of the sampling surface in the Central workings this average assay cannot be considered truly representative.

Areas of lower grade are also indicated. The Upper Trench averages 0.27 lbs/ton and the Downhill Trench 0.2 lbs/ton. 90 foot sections of 0.18 lbs Hg/ton and 0.23 lbs Hg/ton have been delineated in the Southwest and Lower Trenches.

CONCLUSIONS

The work that has been done indicates that there is a reasonable chance that widely separated and relatively small blocks of rock can be outlined in the vicinity of the old workings in the Copper Creek area averaging approximately 0.5 lbs. Hg/ton. Estimates of tonnage and waste : ore ratios are not possible, but

it is apparent that mining of mineralized areas is likely to be expensive and a mining operation would not be economical at the present time.



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J. Alan Coope.

Vancouver, B. C.
December 13, 1967.

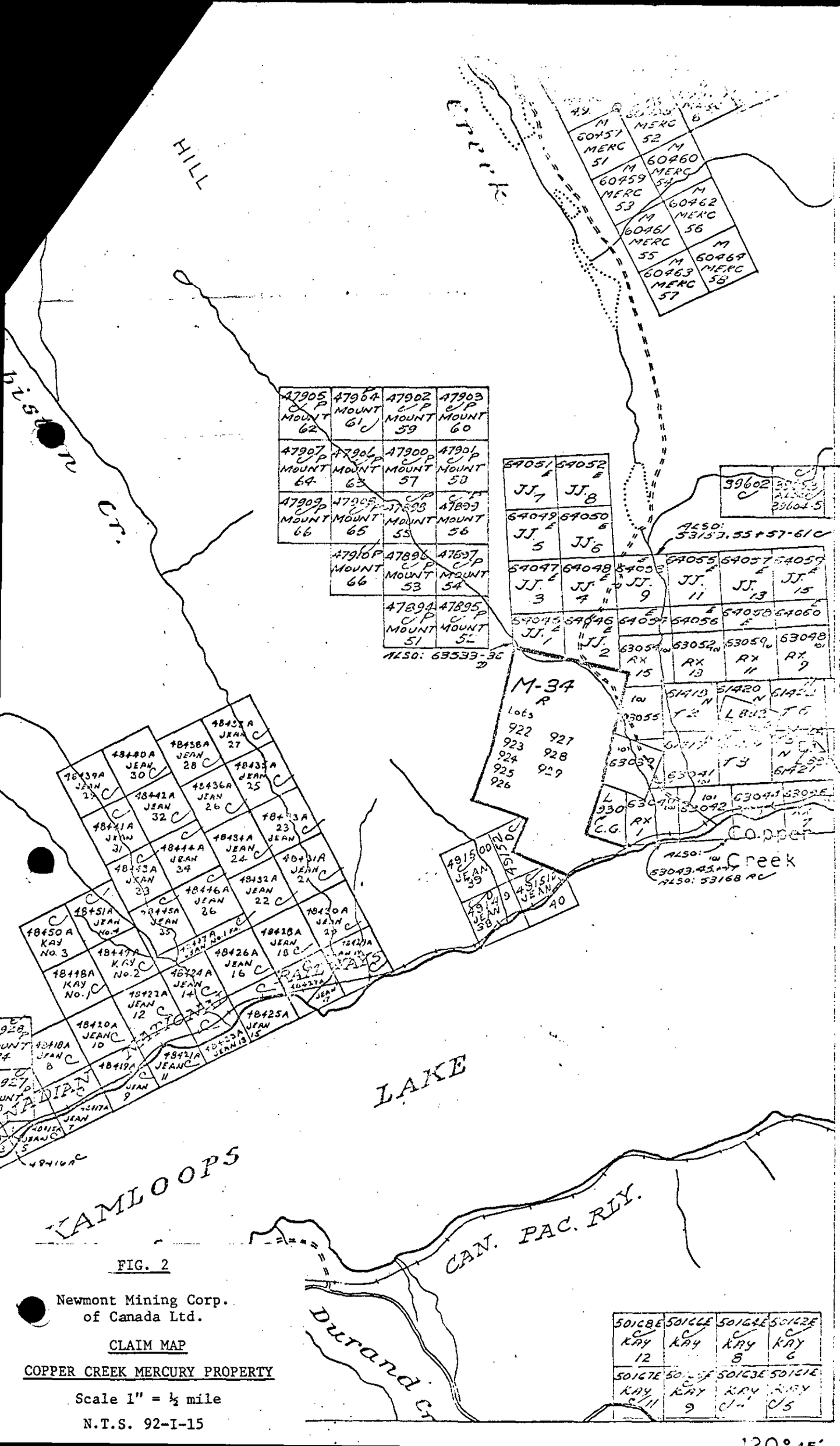


FIG. 2

Newmont Mining Corp.
of Canada Ltd.

CLAIM MAP

COPPER CREEK MERCURY PROPERTY

Scale 1" = ½ mile

N.T.S. 92-I-15

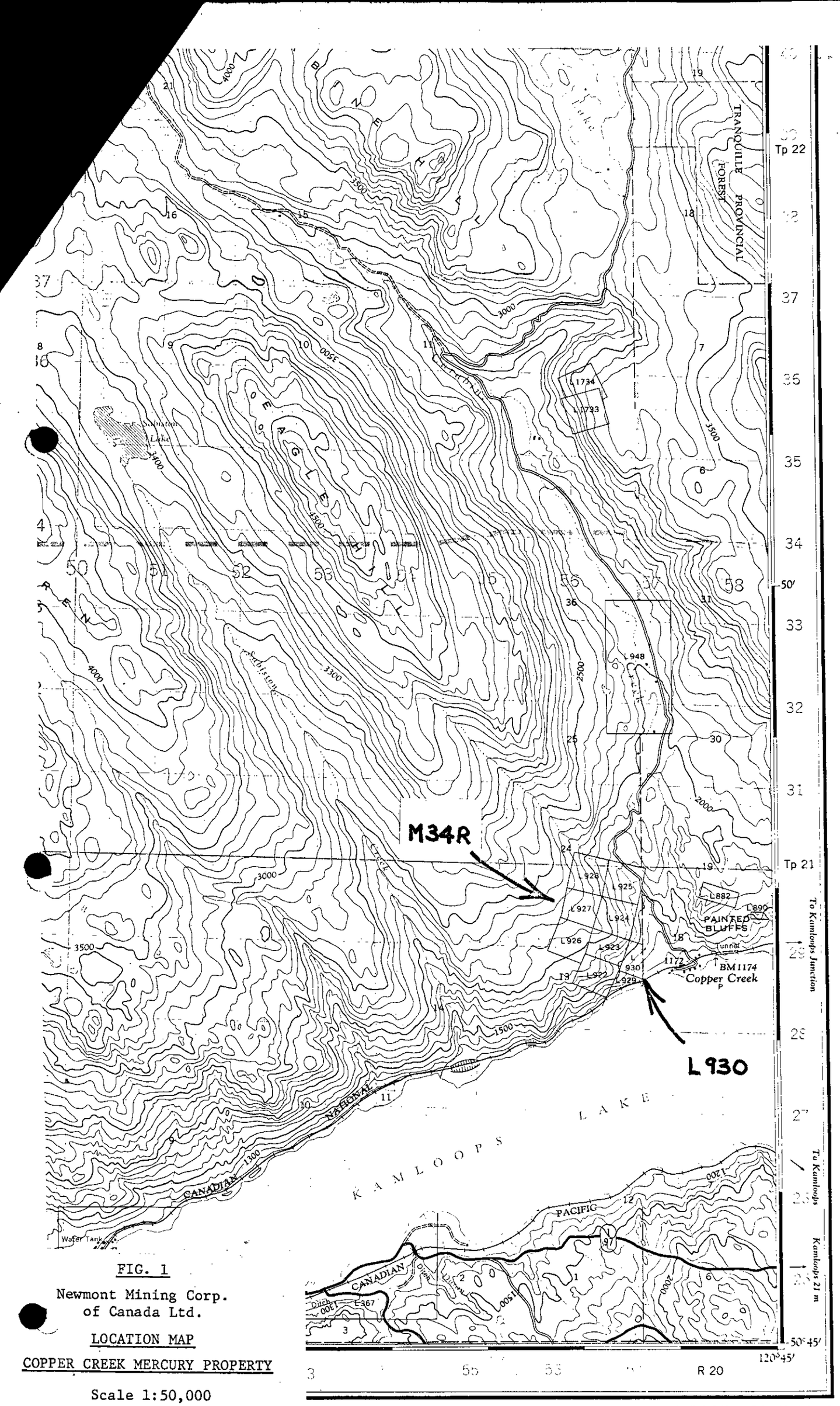


FIG. 1

Newmont Mining Corp.
of Canada Ltd.

LOCATION MAP

COPPER CREEK MERCURY PROPERTY

Scale 1:50,000

N.T.S. 92-I-15

MAGNETIC DECLINATION 23° 42' EAST
AT CENTRE OF MAP 1958
Annual magnetic change 3'30" westerly

Form No. 220 Statutory Declaration. 6-64 WILLSON STATIONERY COMPANY LIMITED •• CLARKE & STUART CO. LTD.

Canada

Province of British Columbia

In the Matter of

To Wit: Affidavit of Costs incurred during execution and reporting of exploration on the Copper Creek Mercury Property, May to December, 1967.

I, J. A. Coope, of Newmont Mining Corp. of Canada Ltd. 604 - 744 West Hastings Street, Vancouver 1, B. C. in the Province of British Columbia.

Do Solemnly Declare that

During the exploration of the Copper Creek Mercury Property (Mineral Lease M-34R; Crown Grant L-930; Located claims Ed 1 - 4), Savona, B. C., in May 1967, the following expenses were incurred:-

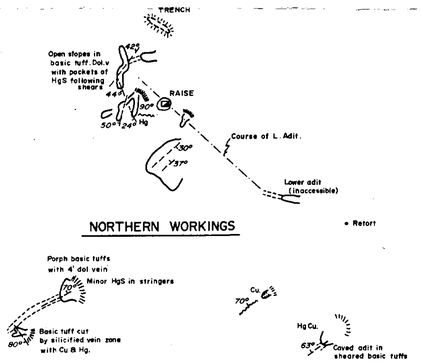
Bulldozer trenching (A. H. Kirshfelt)		$1,167.00	
Assaying (T. S. L. Laboratories)		1,002.75	
Geochemical Analysis (Rocky Mtn. Geochem.)		119.00	
			$2,288.75
Labour:-			
G. C. Gutrath	3 days @ $50.00 per man day	150.00	
E. D. Riordan	15 days @ $18.00 per man day	270.00	
J. H. Tremblay	5 days @ $25.00 per man day	125.00	
J. A. Coope	12 days @ $50.00 per man day	600.00	
			1,145.00
Report Preparation (December, 1967)			
Drafting (Altair Services)		130.00	
J. A. Coope	3 days @ $50.00 per man day	150.00	
			280.00
		GRAND TOTAL	$3,713.75

And I make this solemn Declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath, and by virtue of the Canada Evidence Act.

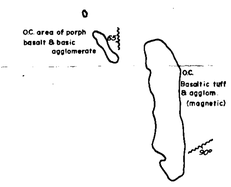
Declared before me
at Vancouver
in the Province of British Columbia.
this 30 day of
January A.D. 19 69

J. Allan Coope

A Notary Public in and for the Province of British Columbia
A Commissioner for taking affidavits for British Columbia

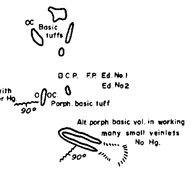


□ C.P. I.P. Ed. No. 1, 2
F.P. Ed. No. 2, 3



METAL PIN
XIII, XXI, XX
(Scribed Markings

COPPER CREEK VALLEY



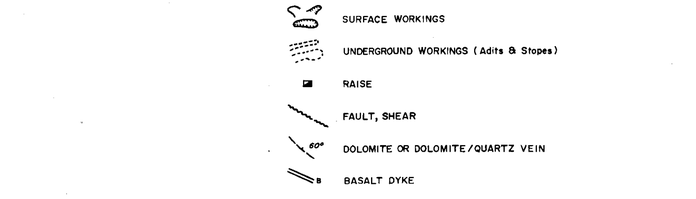
LEGEND

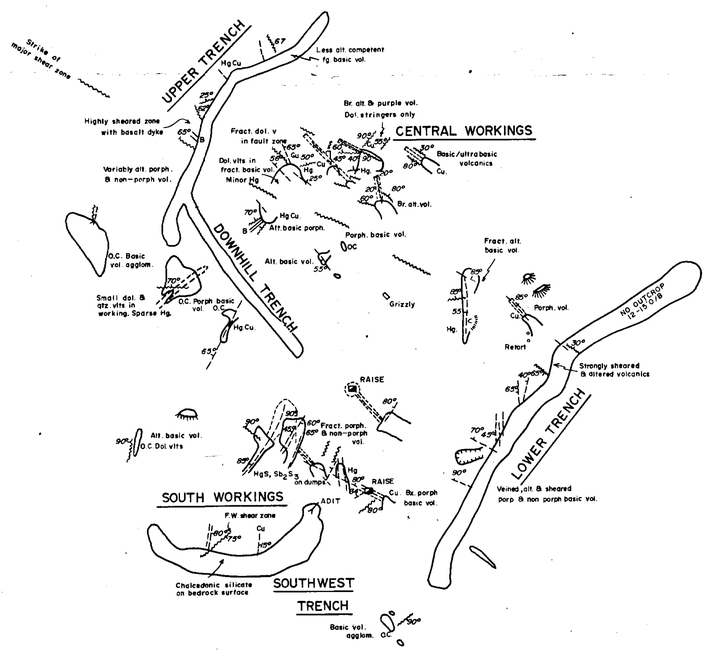
- OC. OUTCROP
- SURFACE WORKINGS
- UNDERGROUND WORKINGS (Adits & Stopes)
- RAISE
- FAULT, SHEAR
- 60° DOLOMITE OR DOLOMITE/QUARTZ VEIN
- B BASALT DYKE
- □ C.P. CLAIM POSTS (Not necessarily valid claims)

ABBREVIATIONS

Hg, HgS ——— CINNABAR
Cu oxides, Cu ——— MALACHITE, AZURITE
Vol ——— VOLCANICS
Fg ——— FINE GRAINED
Porph ——— PORPHYRY

N.B. : *TAPE & BRUNTON SURVEY*





COPPER CREEK
STATION — 3000 ft.

1753

FIG.—3

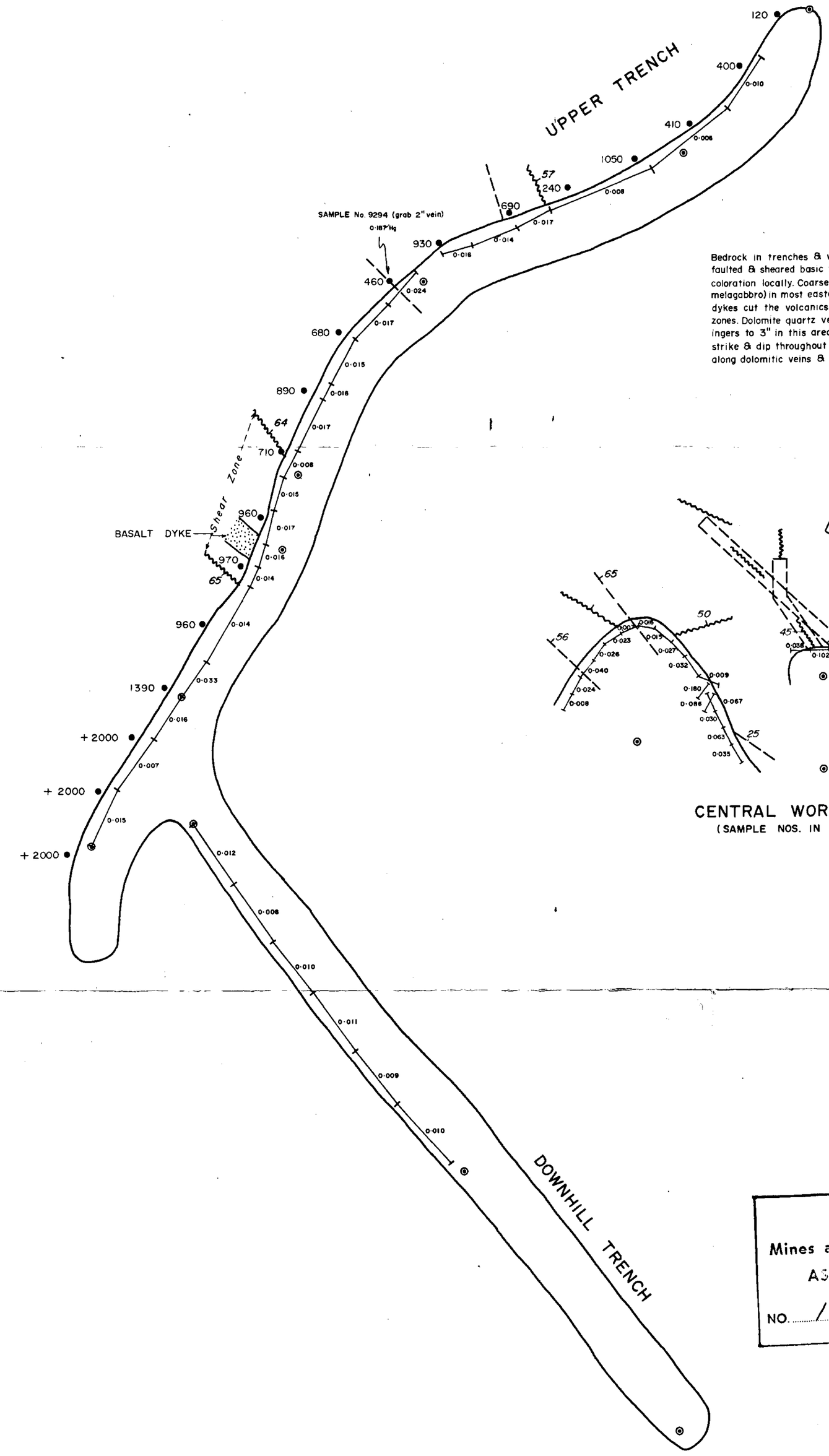
NEWMONT MINING CORPORATION OF CANADA

GEOLOGICAL MAP

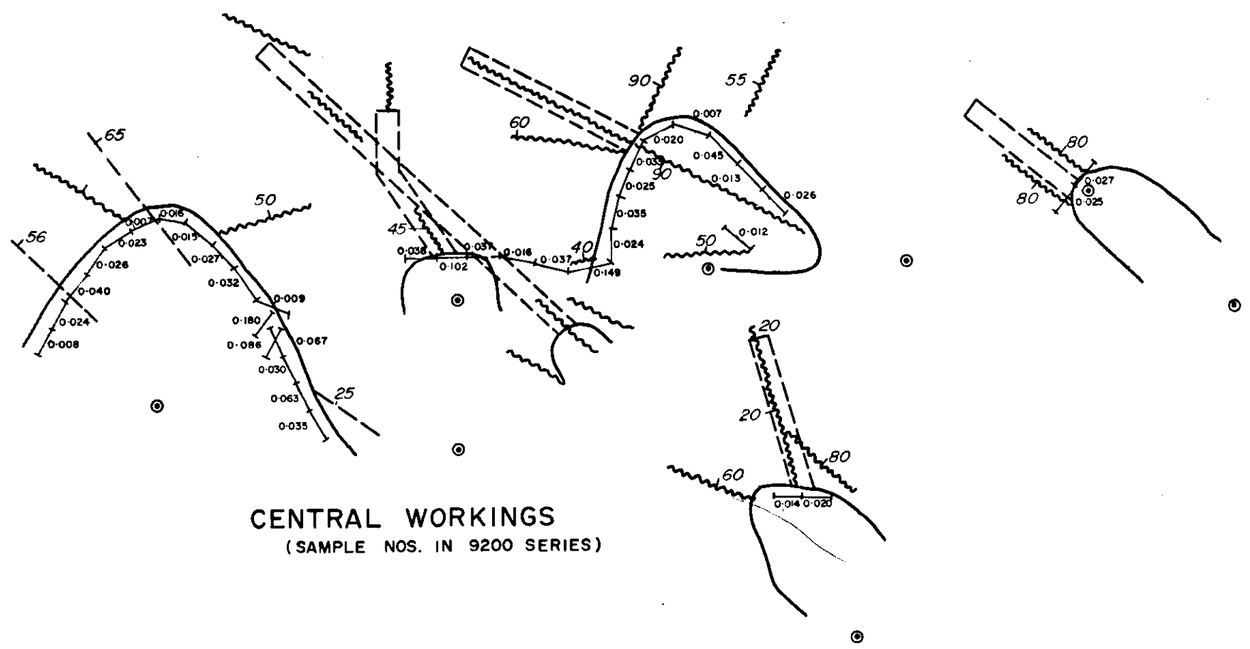
COPPER CREEK MERCURY PROPERTY

SAVONA, B.C. — N.T.S. 92—I—15 (1)

SCALE : 1" = 100ft.	DATE : JULY 26, 1967
DRAWN : H.W.C.	CHECKED :



Bedrock in trenches & workings complexly veined, faulted & sheared basic volcanics. Alteration to brown coloration locally. Coarser grained basic rock (gabbro-melagabbro) in most easterly workings. Basalt-diabase dykes cut the volcanics following shear & fault zones. Dolomite quartz veins vary in width from stringers to 3" in this area. Stringers of very irregular strike & dip throughout exposures. HgS sporadic along dolomitic veins & along same fault & shear-zones



CENTRAL WORKINGS
(SAMPLE NOS. IN 9200 SERIES)

LEGEND

- 1023 ● GEOCHEMICAL SAMPLE LOCATION (showing Hg value) in ppb.)
- 0·001 0·017 ROCK SAMPLE LOCATIONS (Chip Channel) (showing Hg value) in %)
- UNDERGROUND WORKINGS (Adits)
- SURFACE WORKINGS
- FAULTS & SHEAR ZONES
- PROMINENT DOLOMITE OR DOL./QTZ. VEIN

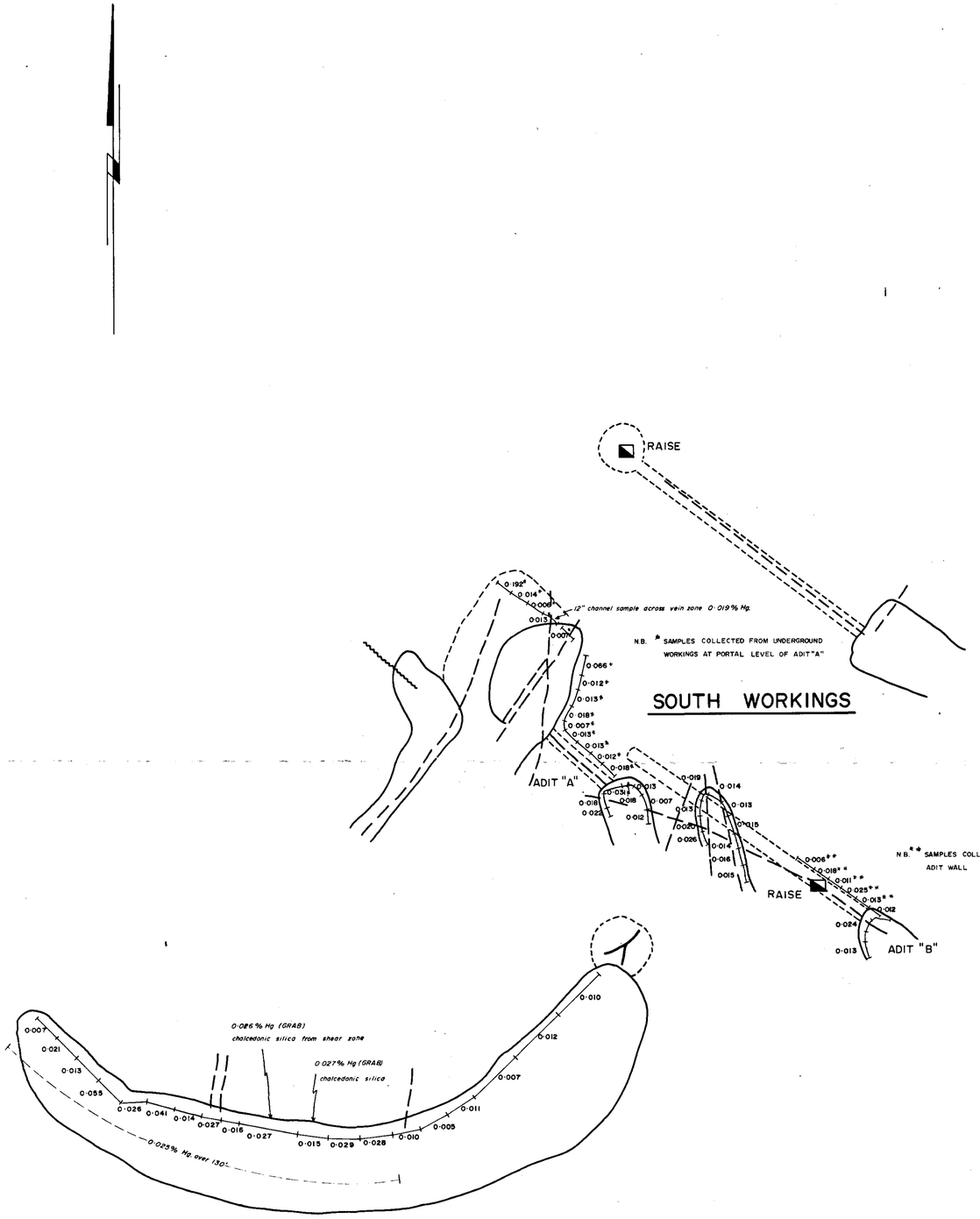
1753

FIG.—4.

NEWMONT MINING CORPORATION OF CANADA

PRELIMINARY MAP
Rock & Soil Sample Locations
COPPER CREEK MERCURY PROPERTY
SAVONA, B.C., N.T.S. 92-I-15 (2)

SCALE : 1" = 25 ft.	DATE : JUNE 22, 1967
DRAWN : H.W.C.	CHECKED :



LEGEND

- Surface workings
- Underground workings
- Adit
- Dolomite or dolomite / quartz vein
- Fault & shear zones
- 0·027 0·115 — Rock sample locations (chip channel) & Hg values (% Hg)

FIG.–5. 1753

NEWMONT MINING CORPORATION OF CANADA

ROCK SAMPLE LOCATIONS & ASSAY VALUES
Area of South Workings (3)

COPPER CREEK MERCURY PROPERTY

SAVONA, B.C. — N.T.S. 92–I–15

SCALE : 1" = 25 ft.	DATE : December, 1967
DRAWN : H.W.C.	CHECKED :