

MERIDIAN RESOURCES LTD. (N.P.L.)
GEOLOGICAL EXAMINATION AND APPRAISAL
HEWITT-VAN ROI MINE PROPERTY
SILVERTON, B. C.

W. M. SHARP, P.Eng.

January 1977

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WILLIAM M. SHARP, M.A.Sc., P.Eng.
CONSULTING GEOLOGICAL ENGINEER
3280 CHESTERFIELD AVENUE
NORTH VANCOUVER, B.C. V7N 3M9

February 5, 1977

British Columbia Securities Commission,
Bank of British Columbia Building,
756 Fort Street,
Victoria, B.C.

Gentlemen:

RE: "REPORT - GEOLOGICAL EXAMINATION & APPRAISAL
of the HEWITT-VAN ROI PROPERTY, SILVERTON AREA,
SLOCAN MINING DIVISION, BRITISH COLUMBIA."

The undersigned hereby gives his consent to the use of the full report or of its full section "Summary & Conclusions/ Estimated Costs" by Meridian Resources Ltd. (N.P.L.) for the purpose of providing public information concerning the property, the currently recommended work program, and cost estimates relating to the latter.

With the above the writer respectfully requests, in accordance with the Commission's formal requirements, that he be given the opportunity to review 'extracts' of the report or independent summaries or evaluations deriving from it.

Yours truly,

W.M. Sharp, P.Eng.

WILLIAM M. SHARP, M.A.Sc., P.Eng.
CONSULTING GEOLOGICAL ENGINEER
3280 CHESTERFIELD AVENUE
NORTH VANCOUVER, B.C. V7N 3M9

February 1, 1977

Meridian Resources Ltd.
(N.P.L.)
Suite 706 - 675 West
Hastings Street
VANCOUVER, B. C.

Attention: Mr. R. W. Hughes, President

Gentlemen:

Pursuant to your instructions, the undersigned hereby transmits his "REPORT, GEOLOGICAL EXAMINATION AND APPRAISAL of the HEWITT-VAN ROI MINE PROPERTY, SILVERTON AREA, SLOCAN MINING DIVISION, BRITISH COLUMBIA."

This report is based on information deriving from the writer's January 6 - 9, 1977 personal examination, personal files, Provincial and Federal Government reports, and the file of mine maps, data, and estimates provided by the writer's client and Mr. Frank Pho of New Denver, B. C.

Mr. Pho's willing assistance on the recent examination is hereby thankfully acknowledged.

Yours truly,

W. M. SHARP, P. ENG.

WMS: dc

REPORT
GEOLOGICAL EXAMINATION AND APPRAISAL
OF THE
HEWITT-VAN ROI MINE PROPERTY
SILVERTON AREA
SLOCAN MINING DIVISION
BRITISH COLUMBIA
(49°56'N, 117°18'W - N.T.S. SHEET 82F/14W)

for

MERIDIAN RESOURCES LTD. (N.P.L.)

VANCOUVER, B. C.

by

W. M. SHARP, P.Eng.
NORTH VANCOUVER, B. C.

January 1977

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REPORT DRAWINGS

FIG. 1	INDEX MAP	bound with text
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DWG. NO. 77-1	PLAN AND LONGITUDINAL-VERTICAL SECTION, HEWITT AND VAN ROI WORKINGS AND ORE ZONES	in pocket
DWG. NO. 77-2	PLAN AND LONGITUDINAL-VERTICAL SECTION, HEWITT EAST ORE SECTION, WORKINGS, GEOLOGY AND MINERALIZATION	in pocket

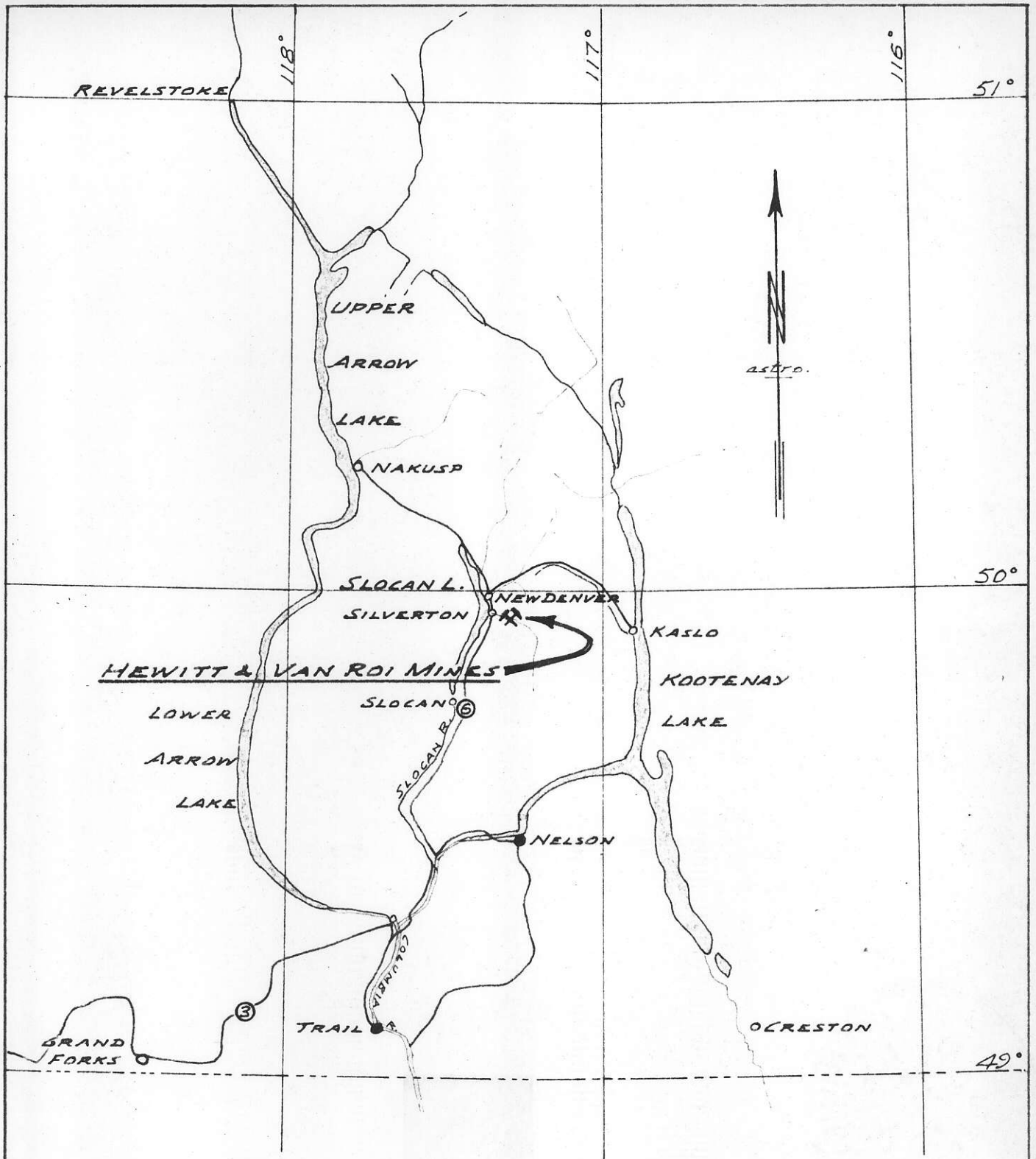


FIG. 1 - INDEX MAP

HEWITT & VAN ROI MINES

SILVERTON AREA - SLOKAN MIN. DIV., B.C.

1 IN. = 20 MI.

JAN., 1977

W. M. SHARP, P. ENG

SUMMARY AND CONCLUSIONS

During successive periods of relatively higher metal prices since 1900 the Hewitt and Van Roi underground mines have been important producers of silver-lead-zinc ore.

The properties situate at about 3 line-miles southeast of Silverton, B. C., and are served by 6 miles of well-graded secondary road. The present focus of proposed development, mining and exploratory work is on the depth extensions of the Hewitt East ore zone, principally below 10-level.

The consolidated Hewitt and Van Roi properties consist of 42 contiguous Crown-granted standard and fractional mineral claims - evidently all in good standing. These, comprising one claim block with an east-west extent of 3 miles, adequately cover the developed and potentially productive intervals of the through-going Hewitt-Van Roi vein-system or 'lode'.

Both properties were discovered and staked prior to 1900. Since then, the Hewitt mine has produced at least 120,000 tons of ore averaging 16.0 oz/ton Ag, 1.7% Pb, and 15.5% Zn. The total recorded Van Roi production, mainly consisting of 'milling ore', amounts to about 300,000 tons averaging approximately 7.6 oz/ton Ag, 2.5% Pb, and 2.2% Zn.

Both mines are on the same through-going lode which dips at an average 70° north and contains two to three distinct fissure veins. The principal or main vein has been productive over widths ranging from 4 to 20 feet. The ore minerals, comprising argentiferous galena, sphalerite, and grey copper occur in a typical gangue of brecciated wall rocks and quartz. Wall rocks generally comprise quartzitic and argillaceous sediments of the Slocan Series. The better ore sections tend to occur on sinuously-trending intervals of veins --- particularly where they cut across folded bedding assemblages.

Estimates of ore reserves within the lower East Zone of the Hewitt mine, ~~where development and mining are presently being considered,~~ are as follows:

- (a) Cunningham Ore Shoot, 13 - 13-1/2 level block:
Firmly-indicated ore = 2,700 tons @ 22 oz/ton Ag, 3.2% Pb, 5.8% Zn.
- (b) Cunningham Ore Shoot, 13-1/2 - 14 level block:
Possible Ore = 2,700 tons @ above noted average grade.
- (c) West Segment, North Vein, 10 - 10-1/2 level block:
Indicated Ore = 1,670 tons @ 14 oz/ton Ag, 2.5% Pb, 8.5% Zn.
- (d) East Segment, North Vein, 10 - 11 level:
Possible Ore (?) = 2,600 tons @ 8.0 oz/ton, 1.5% Pb, 7.0% Zn.

Totals:

Indicated Ore = 4,370 tons @ 19.0 oz/ton, 3.0% Pb, 7.0% Zn.
Possible Ore = 5,300 tons @ 15.0 oz/ton, 2.3% Pb, 6.4% Zn.

The following 'Preliminary Production Estimate' relating to the development and mining of the indicated 2,700 ton ore block extending 50' below 13-level of the Cunningham stope is based on records of 1976 production from the same zone:

Net Returns per ton milled		\$83.77
Less Direct Production Costs		<u>29.03</u>
Gross Operating Profit		\$54.74 per ton
Less: Development Costs/2,700 tons, per ton	\$14.63	
Administration, Engineering, Taxes, etc.	<u>6.00</u>	<u>20.63</u>
Indicated Net Operating Profit		\$34.11 per ton

The above calculation indicates that the proposed mining operation could return a substantial profit. An increase in the total tonnage mined would result in a reduction of the unit ~~mining~~ ^{development} cost and a corresponding increase in the profit per ton mined and milled.

Respectfully submitted,

RECOMMENDATIONS

As corrected by ore reserve estimation & pre-impediment estimated warrants development & diploma of work

STAGE I

Develop and mine indicated 2,700 ton ore block, Cunningham zone, below 13-level.

STAGE II

Explore vein extensions at and below Hewitt 10-level horizon, East mine section.

STAGE III

Open --- contingent on results from Stages I and II.

ESTIMATED COSTS

*2500
15
125
25
37,500*

STAGE I

Provision for initial development and mining	
2,700 tons @ \$20.00/ton	\$54,000
General provision, administration, and overhead	<u>6,000</u>
TOTAL, STAGE I	\$60,000

STAGE II

Diamond-drilling; estim. <i>2,500'</i> @ \$15/ft.	<i>37,500</i> \$30,000
Drifting and cross-cutting, 200' @ \$80/ft.	✓ 16,000
Allowance for prep. of diamond drill stations	✓ 2,000
Provision for extras, overhead and general contingencies - estimate @ 20%	<u>9,600</u>
TOTAL, STAGE II	\$57,600

STAGE III

- relegate to 10-w work

Tentative provision for supplementary exploration and development	\$75,000
---	----------

*pool x 100/ft
lithology, etc.*

Respectfully submitted,

\$120,000

W. M. SHARP, P.Eng.

INTRODUCTION

During the several periods of relatively higher metal prices which have occurred since the year 1900 the Hewitt and Van Roi mines have been major producers of silver-lead-zinc direct smelting and milling ores; some of the former, derived from hand-sorting of oxidized near-surface ore, contained as much as 600 ounces of silver to the ton. Outstanding features of this Slocan property, as disclosed by continuing development to depth, are the strength of the lode and the large vertical range of ore-grade mineralization; the extent of the latter feature, within the 'Hewitt' interval of the through-going Hewitt-Van Roi lode system, exceeds 1,500 feet.

The writer carried out the field work pertaining to this report during (current) January 6 - 9, inclusive. This general examination comprised the inspection, compass-tape surveying, geological mapping, and spot-sampling of the currently-accessible workings and showings on Hewitt 10-level; concurrent 'office' work included inspections, studies, and compilations of such background data and drawings as were concurrently available. In all of the foregoing the writer was very ably and willingly assisted by Mr. Frank Pho of New Denver, B. C.

The following publications, which are generally recognized as the principal sources of information on the mines and geology of the Slocan mining camp, provided some of the general historical and production data presented in this report:

G.S.C. Memoir 173, 1934, C. E. Cairnes

G.S.C. Memoir 184, 1935, C. E. Cairnes

B.C.D.M. Bulletin No. 29, 1952, M. S. Hedley

B. C. Dept. of Mines: Selected official annual reports since 1930.

PROPERTY *omit*

M.H.
(1) LOCATION, ACCESS AND MINE WORKINGS

The Hewitt-Van Roi property centers on a point situating 3 miles southeast of Silverton and approximately 1 mile south of Silverton Creek. The extensive system of adit-drifts and raises extends between elevations of 3,500 and 5,400 feet. Hewitt 10-level and Van Roi 9-level are the present 'working levels' within the property. From Silverton, which is served by Provincial Highway 6, the west and east portals, respectively, of Hewitt 10-level are reached by 5 and 6 miles of well-graded dirt roads. Van Roi 9-level portal is reached via a 1 mile continuation of this same road.

Both the Hewitt and Van Roi sections of what is apparently the same generally W-E trending lode have been explored and developed from crosscuts and drifts driven at successively lower elevations on the ore structure. These, along with their systems of connecting raises and stopes, except those at the lowest levels of the mines, are only locally accessible.

M.H.
(2) PHYSICAL FEATURES AND CLIMATE

The mine area is situated within a relatively rugged part of the Selkirk Mountains. Within the claim group the maximum topographic relief is nearly 3,000 feet; however, slopes are only very locally too steep for foot-travel. Heavy growths of underbrush often *probably* comprise the most formidable obstacle to ground-based exploration. *in the area.*

A heavy mantle of overburden is prevalent over this north-sloping area of the Silverton Creek valley, and generally consists of one to as much as thirty feet of firm clay-till, bedrock fragments and relatively new soil. In addition, much of the area is covered by relatively thick stands of good-sized balsam, cedar, spruce, and tamarack and frequently dense growths of willow and alder underbrush.

The local climate tends to be moderate; ^{but} However, the annual precipitation is relatively heavy. Generally this occurs as snow any time between October and May. As individual snowfalls may amount to 2 or 3 feet, frequent clearing of access roads and mine portal areas may be required during some relatively more severe winters. The depth of snow cover during the writer's recent visit amounted to less than 18 inches at the 10-level, or 3,900 foot elevation; *hence there are no*

access problems at present.

(3) CLAIMS

PROPERTY

The property consists of 42 Crown-granted standard and fractional mineral claims. All are contiguous, and together comprise a block of sufficient area to cover any possible major strike and dip extensions of the Hewitt-Van Roi lode-system beyond the existing workings. The east-west, or 'strike'-length of the block is about 3 miles. The constituent mineral claims, per Schedule "A", Indenture of Lease Dated December 31, 1976 between Arjan Pacific Ltd. and Frank Pho, are as follows:

- (a) Lots: 739 Vancouver No.
740 Mountain Boomer
741 Zilor
2297 Silver Star
2298 Pelly
2299 Napier
2300 Ricardo
2900 Vancouver Fraction

- (b) Lots: 2617 Burnside

- (c) Lots: 6527 Moccasin Fraction
6528 Mackinaw
10051 Burr
10052 El Camino No. 2
10053 Tramway No. 2 Fractional

(d) Lots: 1401 Lorna Doone
1402 Prior
3367 Penobscott
4441 Lorna Doone Fractional

(e) Lots: 1397 Hazard
1398 New Park
1399 Pembroke
1400 Hazard Fraction

(f) Lots: 14175 Edith Fraction
14420 Sam Fraction
14421 Bessie Fraction
14422 Eliza Fraction
14423 Lottie Fraction
14424 S.O.B.
14425 March
14426 Desperation
14427 Apex Fraction

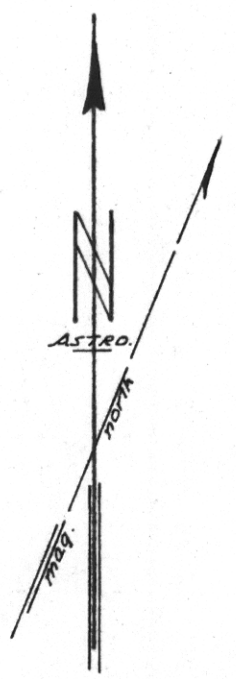
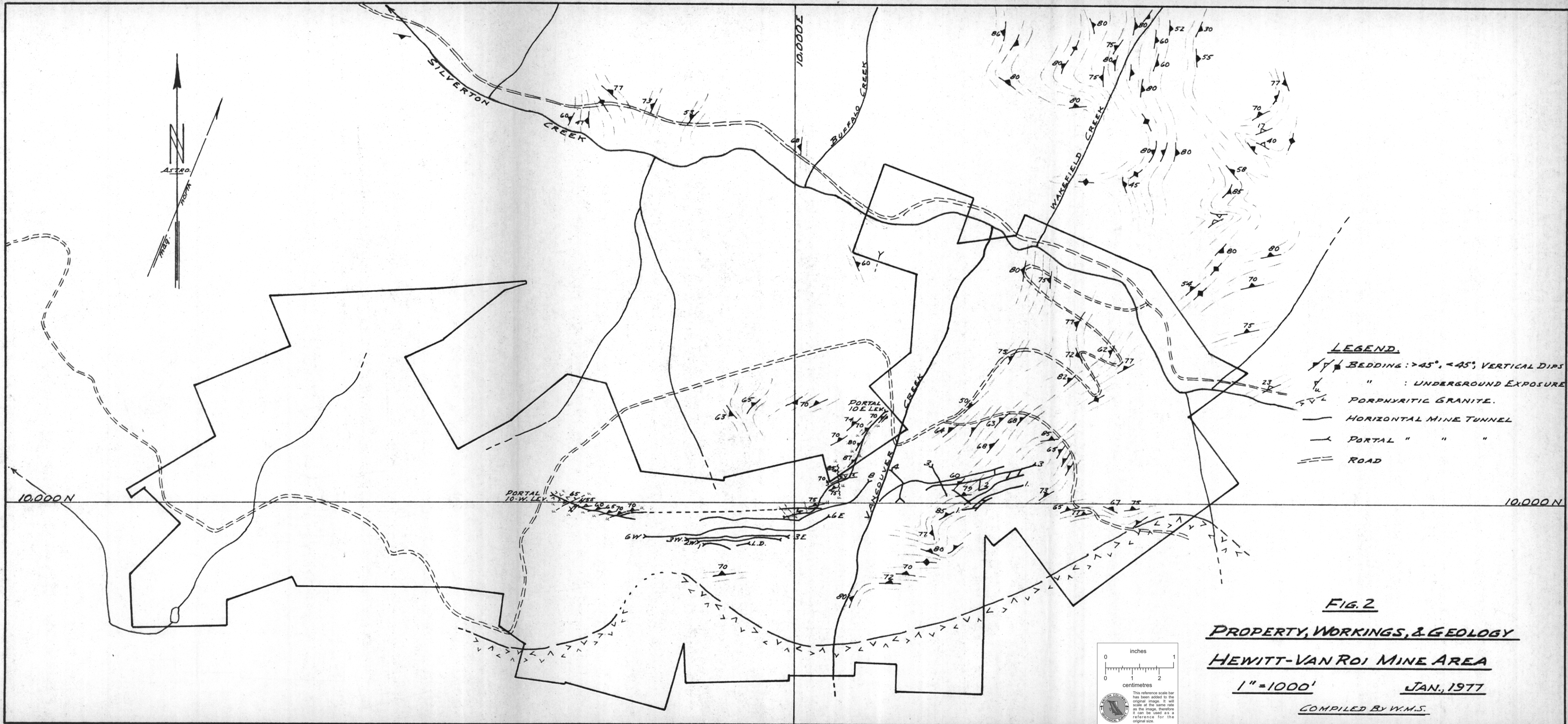
(g) Lot: 10594 Van Roi Fractional

(h) Lot: 14428 Marjorie Fraction

(i) Lot: 2228 Humboldt

(j) Lots: 3362 Ricon Fractional
3363 Ricon
3364 Mole
3366 Tranquility
4440 Hewitt
3365 Crow Fractional

(k) Lots: 14426 Desperation
14427 Apex Fraction



LEGEND

- BEDDING: >45°, <45°, VERTICAL DIPS
- UNDERGROUND EXPOSURE
- PORPHYRITIC GRANITE.
- HORIZONTAL MINE TUNNEL
- PORTAL " " "
- ROAD

FIG. 2

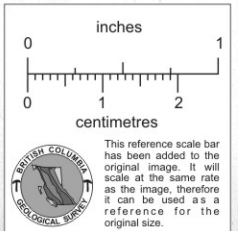
PROPERTY, WORKINGS, & GEOLOGY

HEWITT-VAN ROI MINE AREA

1" = 1000'

JAN., 1977

COMPILED BY W.M.S.



All claims situate within the Slocan Mining Division, Kootenay District, British Columbia.

(b) S.H.
(4) TITLE AND OPERATING AGREEMENTS

abbreviate this section.

Arjan Pacific Ltd. of Vancouver, British Columbia, a B. C.-incorporated company, holds title to the mining property and all appurtenances, free and clear of all incumbrances.

Arjan Pacific Ltd. granted a (direct) lease to Mr. Frank Pho, Miner, of New Denver, B. C. in accordance with the conditions and stipulations noted in the 'Indenture' dated 31st day of December A.D., 1976. The principal conditions and stipulations, being those which involve tenure, payments, and work commitments, are as follows:

- (a) Lease granted for term of three years to December 31, 1979 (plus optional yearly extensions) --- subject to the payment of \$2,500, payment of royalties, and performance of the required work.
- (b) Lessees to undertake necessary rehabilitation, equipment installations, exploration, development, and mining --- to Arjan Pacific's satisfaction and in accordance with all B. C. laws and regulations.
- (c) Lessees to pay Arjan Pacific royalties equivalent to 5% of net smelter returns accruing from ore (and concentrates) derived from the property.
- (d) Arjan Pacific, subject to certain conditions, retains rights of re-entry and re-possession.

Mr. Pho has advised the writer that Arjan Pacific Ltd. has given him the authority by letter, to assign his legal rights and responsibilities as Lessee to Meridian Resources Limited of Vancouver, B. C.

Meridian Resources Ltd. intend to assume the rights and responsibilities as specified in the Indenture made on December 31, 1976, plus supplementary obligations and concessions, essentially on the basis of the (preliminary) Letter of Intent to Sublease Agreement between F. Pho and Meridian Resources Ltd. N.P.L., dated December 16, 1976 at Cranbrook, B. C. For formal substantiation of this agreement the reader is referred to Meridian Resources Ltd.

(c) 15.H.
(5) OPERATING FACILITIES

Serviceable fixed plant consists of the 10-level adits and shaft, compressor house, dry, and equipment repair shed at the Hewitt 10-E portal site, the access road, and mine water supply (rights). The required mechanical items of mine plant are to be supplied by Mr. Pho on a rental, or equivalent basis. Essential facilities which are locally available for use by sub-lesors, at nominal rental, service, or usage rates or charges, include a modern 100 t.p.d. flotation mill near Sandon and ore trucks at New Denver. In addition, a broad range of small supplies and mechanical services are locally obtainable. Major items of mine equipment, parts, and supplies may be obtained from Nelson, B. C. - the latter at some 65 miles by paved highway from the property. *Commercial supplies and specialized repair & install services*

HISTORY AND PRODUCTION RECORD

Mineralized outcrops of veins related to the through-going lode were discovered and staked on both the Hewitt and Van Roi intervals of it in 1892. Since that date, excepting the first period of temporary amalgamation during 1917-20 and more recent ones, the Hewitt and Van Roi properties were separately owned by a succession of owners who operated them mainly during periods of higher average metal prices.

Development of the Hewitt claims commenced in 1896 and shipments of hand-sorted ore commenced shortly thereafter - some containing up to 600 oz/ton silver and 20% lead (zinc not reported; some discarded).

During 1901-02 shipments amounted to 2,670 tons which averaged about 59 oz/ton silver and less than 1% lead (zinc not reported).

To the end of 1926 production from the Hewitt section of the lode, based on incomplete production records, totalled 93,000 tons of ore averaging about 14 oz/ton silver, slightly over 1% lead, and 18% zinc. Total reported ore production from the 'Van Roi' section of the lode to the end of 1926 amounted to 262,000 tons with an average grade exceeding 8 oz/ton silver, 2.6% lead, and 2% zinc - including a significant proportion of 'milling grade' ore.

The Hewitt mine was explored, developed, and mined by a succession of companies and leasers at intermittent periods until 1971. The operating and mining groups included the Victoria Syndicate (1926-30), various lessors (1935-46), Granby Company (1946-47), Van Roi Consolidated Mines Ltd. (1950-52), Slocan Van Roi (1958-59), followed by various leasers, including F. Pho until 1970. During 1926-70, gross ore production amounted to: 26,800 tons averaging 24 oz/ton silver, 4.2% lead, 6.8% zinc - principally from the main vein in the East ore zone, between no's 9 and 13 levels. *bringing total to*

*93,000
26,800
119,800 -
2.6% lead / 20,000
tons.*

Since late 1972 Arjan Pacific Ltd. have controlled the amalgamated Hewitt and Van Roi properties, and have granted leases to successive groups who have undertaken exploration, rehabilitation, and, latterly, mining by F. Pho above 13-level.

Very little activity occurred at the Van Roi property between 1926 and 1947. In 1947 Van Roi Mines Ltd. became the operating company and until 1950 developed and mined a modest tonnage of ore in the upper S.E. section of the workings. Following the consolidation of the Hewitt and Van Roi properties in 1950, the Van Roi ground was subjected to a more intensive program of exploration, development, and mining; also, a 100 t.p.d. flotation mill was constructed to handle the production from both properties. However, due to a combination of low ore grade and lower metal prices, full-scale operations were terminated in 1952.

Between 1952 and 1960 leasers extracted a few thousand tons of higher grade ore. Since 1960 no mining has been accomplished. During 1971, the Hewitt mapping program was extended into Van Roi ground. Gross ore production from the Van Roi since 1926 amounted to 38,300 tons averaging 5 oz/ton silver, 2.2% lead, and 3.5% zinc.

GENERAL GEOLOGY

(a) HEWITT-VAN ROI LODE SYSTEM

Hewitt-Van Roi Lode

The lode system comprises one of the major ore structures of the district, in that it can be traced from the Galena Farm property on the west, through the Hewitt and Van Roi properties, thence east-northeastward through Granite Creek - suggesting a total length of at least, and probably considerably more than 4 miles. The lode lies mostly within sediments of the Slocan series close to the E-W trending northern contact of the Nelson batholith.

The Hewitt interval of the lode, amounting to about 3,000 feet, comprises a zone of shearing and fissuring over a width of about 100 feet. The composite structure trends easterly and dips on the average, about 70° north. The lode contains at least three distinct fissure-veins. Of these the so-called 'North' or main vein has proved to be the most continuous and productive and within the Hewitt workings has been mixed over widths ranging from 4 to 20 feet.

*3 members
re designate
lodes & name
others:
north, main, south*

The easterly, but locally cross fault-interrupted extension of the lode into Van Roi ground is structurally similar to the Hewitt segment. However, over its 3,000 foot extent within the Van Roi mine it generally comprises two, rather than three productive members, trends east-northeasterly, and has an average dip of about 75° north. Within both mines the lode-filling consists of wall rock breccia in a matrix of quartz and, locally, minor siderite. The ore minerals, occurring in bands or scattered throughout the gangue, comprise galena,

*2 members
North &
South.*

sphalerite, grey copper, and ruby silver.

Wall rocks are mostly an assemblage of compact but generally brittle quartzites and argillites and more-or-less limy intergradations of these rock types. The best vein mineralization appears to have been developed where the lode cuts across (folded) sections of bedding, rather than where it nearly parallels them. Within the East ore zone of the Hewitt mine ore has, to date, been stoped over a vertical range of 1,200 feet, and a significant extension of the ore shoot below the present bottom, or 13th level is expected.

Note alt'n of frequent interbeds

DETAILED GEOLOGY

(a) (b) HEWITT 10-WEST ADIT

The initial 950 feet of this tunnel bears E.S.E.; its inner 550 feet starts on an E.N.E. bearing but finishes on an easterly bearing to parallel the strike of the local bedding section and, presumably, the local trend of the lode. Its inner end (south branch) is blocked by a cave which, apparently, is the result of sluffing of gouge at either the actual hanging wall of the lode or from a flatly-dipping fault which may locally cut (and displace?) it.

The initial part of the tunnel crosscuts sections of coarse-grained granodiorite and strongly bedded, but locally thinly-banded Slocan sediments. The latter, due to their proximity to the main batholith, have all been altered to some degree - resulting in an assemblage of hard to firm-competent quartzitic to hornfelsic rocks. The general attitude of the innermost (lode) panel of bedding is fairly indicative of the attitude of the lode in this part of the mine. From this, the writer infers an easterly strike and 65° - 70° northerly dip for the lode both here and for at least part of its length within the 'West' ore zone. This particular strike and dip relate to productive areas of the main lode within higher parts of the West ore zone and within the lower easterly section of the mine. Consequently, there is a fair degree of probability that significantly mineralized areas of the lode exist within the general 10-level horizon of the West ore zone.

typing error here

(b) LOWER EASTERLY WORKINGS.
(c) HEWITT 10-EAST AND LOWER WORKINGS

No. 10-East adit, collared (1928) at a point situating some 1,000 feet north of the projected position of the lode at this elevation, was driven southwesterly to intersect possible down-dip extensions of ore or mineralization previously opened by 9-level. At about 1,800 feet from the portal the adit intersected (1928) what is apparently the main vein of the lode. From this point of intersection it was turned westward to explore the vein. Approximately 1,000 feet of drifting was accomplished, in the course of which good ore similar to that found on 9-level was opened over a length of 110 feet and widths ranging from 5 to 15 feet. The mine was closed down in 1930 and, as a result, development and mining of this block which comprised the 9-10 level extension of the rich Cunningham ore shoot was not started until 1946.

Exploration and development of the main vein below 10-level was started in 1955. To accomplish this a hangingwall lateral was driven on a general N80°E bearing from a point about 50 feet back from the face of the main crosscut. From this, the depth extension of the Cunningham ore shoot was located by diamond drilling, and developed by means of a 65° winze which, since 1956 to the end of 1976, has been sunk through 11, 21 and 13-levels, the development crosscuts and drifts driven from the successive shaft stations and the successively developed '100-foot' ore blocks extracted - in part by leasers, including Mr. Frank Pho. The available records indicate that the total ore production, to December 31, 1976, from 10-13 level interval of the Cunningham ore shoot is approximately: 14,469 tons averaging 15.8 oz/ton silver, 3.2% lead, 5.1% zinc. ⁵⁰⁰

To date no strike extensions of the main vein beyond the mined ore shoot below 10-level, excepting a short length on 11-level, appear to have been explored to any significant extent. Also, it appears doubtful that its 10-level extensions east of the inner end of the main crosscut have been more than very locally tested.

(c) HEWITT 10-EAST & LOWER WORKINGS *duplicate here*

A mineralized quartz vein was exposed by the hanging wall lateral within the initial part of its advance from the main crosscut. This structure tends to maintain a near vertical dip, and on its westerly course gradually swings into the south wall of the lateral. A 120 feet strike length of the vein was investigated by a series of crosscuts and raises. This showed it to be slightly to moderately mineralized with pyrite, sphalerite and minor galena. Bands, patches, and specks of these sulphides occur in well fractured quartz veined by siderite. A fault which cuts across the lateral a short distance west of the innermost test-raise appears to effect a southward displacement of the westerly continuation of the vein. It is quite probable that the strongly mineralized vein between the main drift and the hanging wall lateral comprises the faulted westerly continuation. Mineralization within this segment of the structure, currently designated as the 'North' veins appears, on the basis of sloped exposures examined, to weaken above 10-level but to strengthen in the down-dip direction. In the writer's opinion, its dip-extensions below 10-level constitute another important drill target within the East ore zone. The through-going lode-system strikes easterly, with an average dip of 70° north, through most of the Hewitt mine workings. Within the easterly workings, however, it maintains its typically steep northerly dip but shows a slight northerly deflection in strike, which becomes even more pronounced along its easterly continuation through the Van Roi property.

In more westerly parts of the mine, and within the lower levels in particular, the lode has a consistent due-easterly trend. In these sections the shears and veins comprising it, but excluding 'link' veins, are essentially 'bedded' structures with strikes and dips being generally conformable with those of a uniformly eastward-striking lode-panel of strongly bedded, rather massive firm quartzites and brittle, silicified and otherwise altered argillaceous rocks. Development of the lode or, more specifically, of the various structures

comprising it, appeared to have been caused by an eastward and downward displacement of the footwall relative to the hanging wall block. Ore bodies in relatively straight bedded-lodes within zones of strong competent bedding formations, which is the general situation in the westerly part of the Hewitt mine, tend to lie in and adjacent to strongest of the veins comprising the lode. In closer detail, the more restricted zones of open fissuring and brecciation localizing ore shoots tend to occur where subsidiary veins intersect the main vein, within wedges or lenses formed by temporary 'splitting' of the vein, and where the main vein locally deflects across the bedding.

Within the East ore zone the lode traverses bedding assemblages which are substantially different than those to the west. The East zone rocks are predominantly mixed assemblages of thinner-bedded argillaceous to quartzitic sediments. These were mapped in detail. The writer's correlations of the plotted detail suggest the presence of a major (mine-scale) drag fold, which has been at least locally complicated by subordinate drag folds and buckles. Due to the generally mixed, folded character of the bedding assemblages traversed by them, both the 'Main' vein and subsidiary 'North' vein have developed as rather sinuously-trending fracture-structures. As a result, 'open-space' conditions have developed within local strike-intervals. The steeply plunging 'Cunningham' ore shoot evidently formed at a strong bend in the main vein which, also, appears to persist down-dip through 13-level. Both mineralized sections on the north vein occur at paired bends along the (faulted) trend of the structure. The occurrence of stronger mineralization on the westerly segment of the pair is probably due to the fact that it has a definite cross-cutting relationship to the local bedding section. Similar structural situations within its westerly strike-extension are possible. *which tend to localize ore bodies.*

The rock types and bedding attitudes noted along the 1,700 feet length of the 10-E main crosscut apparently relate to a wide panel of mixed and complexly drag folded sediments. This probably occupies the whole

section between the easterly Hewitt and westerly Van Roi workings and, as such, comprises an essentially unexplored potentially ore-bearing 1,400 to 1,500 feet interval of the through-going lode. It is probable that lode and vein patterns within this interval will be similar to, or perhaps more complex than those within the Hewitt East zone.

ore may be at depth in this section.

M.H.
(d) CURRENT SAMPLING RESULTS

The following refer to the writer's sampling of Hewitt East zone vein exposures, as shown on Dwg. 77-2:

No.	Location	Type	True Width, feet	Ag, oz/ton	Pb, %	Zn, %
1.	North vein, Sta. 2+80'W	Cut	3.3	2.32	0.63	5.45
2.	North vein, Sta. 3+20.5'W.	Cut	3.0	2.70	0.10	5.54
3.	North vein, Sta. 8+27'E.	Cut	3.0	18.05	2.05	13.40
4.	North vein, Sta. 10+40'E	Grab	10.0	10.60	3.10	6.15

Sample 1 and 2 are indicative of the average grade of mineralization of the (faulted) easterly segment of the 'North' vein. Based on a visual appraisal, the writer infers that the mineralization weakens up-dip, but strengthens down-dip. There is a good possibility that the mineralization strengthens sufficiently in the down-dip direction to comprise ore at a relatively short distance below 10-level.

X also further E. on strike - lptensicms

Samples 3 and 4 are approximately representative of material comprising the westerly (faulted) segment of the North vein. On the basis of the recorded grade of ore recently mined and shipped from the property, samples 3 and 4 represent ore-grade material. It is expected that the ore and generally mineralized vein material within the sill of the working at 10-level will extend to, and possibly through 11-level.

CURRENT ORE RESERVES
ORE ESTIMATES AND POTENTIAL

(a) LOWER EAST ZONE, HEWITT MINE (Dwg. 77-2)

- (1) Cunningham Ore Shoot, 13 - 13-1/w² level block:
Firmly-Indicated Ore @ 80' x 8' x 50' @ 12 cu. ft. per ton @
estimated average mined grade in 1976 from 12-13 level block:
2,700 tons @ 22 oz/ton Ag, 3.2% Pb, 5.8% Zn
- (2) Cunningham Ore Shoot, 13-1/2 - 14 level block:
Possible Ore, @ above tonnage and grade,
2,700 tons @ 22 oz/ton Ag, 3.2% Pb, 5.8% Zn
- (3) West Segment, North Vein, block 10 - 10-1/2 level:
Indicated Ore @ 80' x 5' x 50' @ 12 cu. ft./ton @ cut-avg.
of sampled grade:
1,670 tons @ 14 oz/ton Ag, 2.5% Pb, 8.5% Zn
- (4) East Segment, North Vein, block 10-11 level or equivalent:
Possible Ore @ 80' x 4' x 100' @ 12 cu. ft./ton @ geol.-indic.
grade:
2,600 tons @ 8.0 oz/ton Ag, 1.5% Pb, 7.0% Zn

Summary:

Indicated Ore: 4,370 tons @ 19.0 oz/ton Ag, 3.0% Pb, 7.0% Zn.

Possible Ore: 5,300 tons @ 15.0 oz/ton Ag, 2.3% Pb, 6.4% Zn

(b) POTENTIAL, HEWITT-VAN ROI LODGE (Dwg. 77-1)

The following estimates should be interpreted only as the writer's personal and, necessarily, very tentative assessment of the residual ore potential. They are generally based on the assumption that a specific percentage of the total projected area of the stopes is representative of that percentage of total past ore production;

hence, Potential Ore, Hewitt Interval:

At approximately 50%, or 60,000 tons @ 16.0 oz/ton Ag, 1.7% Pb,
15.5% Zn

Potential Ore, Van Roi Interval:

At approximately 20% or 60,000 tons @ 7.6 oz/ton Ag, 2.5% Pb, 2.2% Zn

The comparative grade figures, although very tentative, assign the
main ore potential to the Hewitt^v lode.

interval of the

PRELIMINARY PRODUCTION ESTIMATES

*up-date per data
in Submission rept.*

The following estimates are based on net returns from custom milling of 641.8 tons tons of ore derived from the 12-13 level block of the Cunningham orebody during 1976; all ore was processed at the Kam-Kotia mill, Sandon, B. C. Proposed initial production, 1977 = 2,700 tons @ 1976 grade:

On 641.8 tons ore:

Estim. Total Pb Conc. settlement = $37,341.11 \times \frac{100}{75} =$ \$49,775.00

Estim. Total Zn. Conc. settlement = $14,999.47 \times \frac{100}{95} =$ 15,788.44

Estim. Net Conc. Value re 641.8 tons = \$65,563.44

Estim. Net Conc. Value re 2,700 tons = \$275,800.00 rounded

Estim. Total Deductions, 2,700 tons
Milling, Conc. Haul, Assaying = 49,604.00 rounded

Net Mill Returns, 2,700 tons, 10 mo. \$226,196.00

Net Mill Returns, per ton \$ 83.77

Less Costs per ton:

Mining	15.00
Trucking	5.00
Royalty @ 5%	4.19
Contingencies, 20%	<u>4.84</u>

*40,000
200*

29.03

Gross Operating Profit \$54.74 per ton

Less: Development, $\frac{80,000 - 40,500}{2,700} =$ ~~\$14.63~~

20,00

Administration, Engineering, Taxes, etc. = ~~6.00~~ 30.00 20.63

Indicated Net Operating Profit ~~\$34.11~~ per ton

24.74

Respectfully submitted,

W. M. SHARP, P.Eng.

January 31, 1977
North Vancouver, B. C.

CERTIFICATE

I, WILLIAM M. SHARP, with business and residential addresses in North Vancouver, British Columbia DO HEREBY CERTIFY THAT:

1. I am a graduate of the University of British Columbia with a M. A. Sc. (1950) degree in Geological Engineering.
2. I am a Registered Professional Engineer in the Province of British Columbia, Reg. No. 2164.
3. I have practiced my profession since 1950, and as geological consultant since 1964.
4. I have personally examined and sampled the accessible underground showings at the Hewitt mine during January, 1977 for Meridian Resources Ltd. (N.P.L.).
5. This report is based on my personal examinations, public geological reports and maps, and general and technical data provided by Mr. F. Pho, New Denver, B. C.
6. I have no direct or indirect interest in the property or securities of Meridian Resources Ltd. (N.P.L.), nor do I expect to acquire any such interest in them.

W. M. SHARP, P. ENG.

North Vancouver, B. C.
January 31, 1977

WILLIAM M. SHARP, M.A.Sc., P.Eng.
CONSULTING GEOLOGICAL ENGINEER
3280 CHESTERFIELD AVENUE
NORTH VANCOUVER, B.C. V7N 3M9

January 31, 1977

Meridian Resources Ltd. (N.P.L.),
Vancouver, B.C.

Attention: Mr. R.W. Hughes, Pres.

ADDENDUM TO REPORT ON HEWITT-VAN ROI

BREAKDOWN OF LUMP-SUM ESTIMATE - \$80,000

RE: PRE-PRODUCTION & MINING COSTS REL. TO
EXTRACTION OF 2700 TONS FROM SUB.-13 LEV. BLOCK

1. Unwater shaft, install hoist and auxili. equip. -	\$ 5,000
2. Sink 125' of 6'x8'-2 cpt. shaft @ \$305/ft. <i>@ cost</i>	38,000
3. Cost of shaft timber ----- <i>@ min. cost</i> -----	2,000
4. Drive 50' of 5'x7' x-c @ \$50/ft <i>@ cost</i> -----	2,500
5. Mine and deliver ore to portal ore bin, 2700T @ \$12-	32,400
6. Miscellaneous -----	100
TOTAL -----	\$80,000

ADDITIONAL MINING COSTS:

Rental on equipment for above quoted by F. Pho
@ approx. \$2010 mo. x approx 3 mo. minimum ----- \$ 6,030

Rental charges on pumping equip. & install. ---- not estab.

Other charges - not yet identified; hence ---- " "

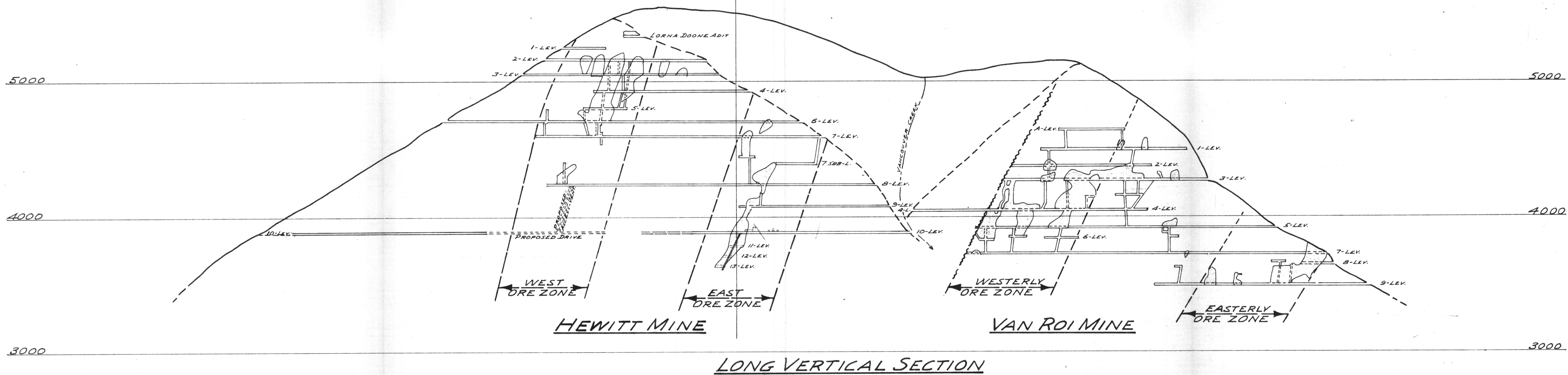
Other, relative to above - enquire F. Pho.

W.M. Sharp, P.Eng.

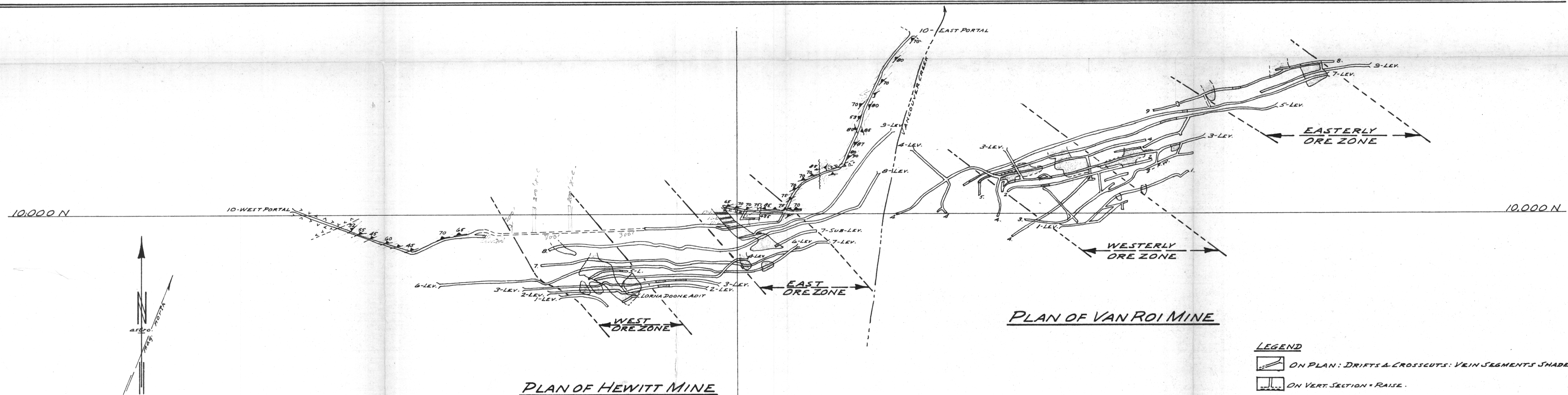
(c) HEWITT 10-EAST & LOWER WORKINGS

A mineralized quartz vein was exposed by the hanging wall lateral within the initial part of its advance from the main crosscut. This structure tends to maintain a near vertical dip, and on its westerly course gradually swings into the south wall of the lateral. A 120 feet strike length of the vein was investigated by a series of crosscuts and raises. This showed it to be slightly to moderately mineralized with pyrite, sphalerite and minor galena. Bands, patches, and specks of these sulphides occur in well fractured quartz veined by siderite. A fault which cuts across the lateral a short distance west of the innermost test-raise appears to effect a southward displacement of the westerly continuation of the vein. It is quite probable that the strongly mineralized vein between the main drift and the hanging wall lateral comprises the faulted westerly continuation. Mineralization within this segment of the structure, currently designated as the 'North' veins appears, on the basis of sloped exposures examined, to weaken above 10-level but to strengthen in the down-dip direction. In the writer's opinion, its dip-extensions below 10-level constitute another important drill target within the East ore zone. The through-going lode-system strikes easterly, with an average dip of 70° north, through most of the Hewitt mine workings. Within the easterly workings, however, it maintains its typically steep northerly dip but shows a slight northerly deflection in strike, which becomes even more pronounced along its easterly continuation through the Van Roi property.

In more westerly parts of the mine, and within the lower levels in particular, the lode has a consistent due-easterly trend. In these sections the shears and veins comprising it, but excluding 'link' veins, are essentially 'bedded' structures with strikes and dips being generally conformable with those of a uniformly eastward-striking lode-panel of strongly bedded, rather massive firm quartzites and brittle, silicified and otherwise altered argillaceous rocks. Development of the lode or more specifically, of the various structures



LONG VERTICAL SECTION

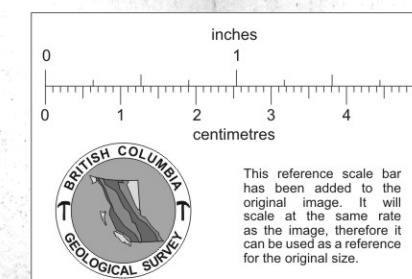


PLAN OF HEWITT MINE

PLAN OF VAN ROI MINE

LEGEND

- ON PLAN: DRIFTS & CROSSCUTS: VEIN SEGMENTS SHADED.
- ON VERT. SECTION = RAISE.
- EXISTING SLOPE.
- BEDDING, WITH STRIKE & DIP, INCL. ARELLACEOUS, QUARTZIC, LIMY, AND MIXED WALL ROCKS.
- FAULT, WITH STRIKE & DIP.
- PORPHYRITIC GRANODIORITE.



W. M. SHARP, P.Eng.		CONSULTING GEOLOGICAL ENGINEER NORTH VANCOUVER, B.C.	
MERIDIAN RESOURCES LTD. (N.P.L.)			
HEWITT & VAN ROI MINES			
SILVERTON AREA		SLOCAN M.D.	
PLAN & LONGITUDINAL-VERTICAL SECTION WORKINGS & ORE ZONES			
BASED ON W.M.S. MAPPING & ARJAN PACIFIC DETAIL			
Scale: 1"=400'	Drawn by: W.M.S. & R.P.	Revision: Date: JAN, 1977	Dwg. No. 77-1