

*File: Silmonac Kam Kotia - Burkam JV*

INTERIM EVALUATION REPORT

KAM-KOTIA - BURKAM JOINT VENTURE  
SILMONAC MINE, NEW DENVER, B.C.

W. M. SHARP, P. ENG.,      FEBRUARY, 1972

801110

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February 2, 1972

Mr. D. M. Mercier, President,  
Moneta Porcupine Mines Ltd.,  
420 - 475 Howe Street,  
Vancouver 1, B.C.

Dear Mr. Mercier:

With this, the undersigned respectfully submits his  
"Interim Evaluation Report on the Kam-Kotia-Burkam Joint Venture,  
Simonac Mine, New Denver, B.C."

In accordance with your stated requirements, the report  
deals mainly with the operational and economic aspects of the  
mine. However, it includes reasonably comprehensive descriptions  
of the geological setting, ore controls, and physical features of  
the orebodies - which the writer hopes will encourage the reader  
to personally speculate on the property's long-range exploration  
possibilities, which are generally beyond the scope of this re-  
port.

Estimates and conclusions presented in this report are  
based on the considerable amount of background and recent infor-  
mation provided by Company principals, and on the writer's con-  
tinued personal experience with the operation and general locality.  
Estimates pertaining to the evaluation of the near-term prospects  
of the operation are believed to be both factual and conservative.

Yours truly,



W. M. Sharp, P. Eng.

**INTERIM EVALUATION REPORT**

**on the**

**KAM-KOTIA - BURKAM JOINT VENTURE  
SILMONAC MINE  
NEW DENVER, BRITISH COLUMBIA**

**by**

**W. M. SHARP, M.A.Sc., P. ENG.  
NORTH VANCOUVER, B.C.**

**FEBRUARY 2, 1972**

**I N D E X**

	<u>Page</u>
SUMMARY & CONCLUSIONS.....	1
INTRODUCTION.....	3
PROPERTY.....	4
LOCATION & ACCESS.....	4
MINE WORKINGS & GENERAL PLANT.....	5
HISTORY.....	6
GEOLOGY & MINERALIZATION.....	6
CURRENT MINE OPERATIONS.....	10
ORE RESERVE ESTIMATES.....	12
NET SMELTER VALUES, LEAD & ZINC CONCENTRATES.....	14
NET SMELTER VALUE OF ORE - MILL-HEAD BASIS.....	16
ESTIMATES - FUTURE PRODUCTION.....	16
EXPLORATION POSSIBILITIES.....	18

SUMMARY & CONCLUSIONS

The Silmonac claim group includes a central 2½ mile strike-length of the main Slocan lode which, over its 6 mile strike-length, has accounted for over 70% of the 75 million dollar production of the camp. The Silmonac mine workings lie on the main lode, and within the optimum sub-axial part of a major <sup>overturned</sup> bedding flexure within which several of the former orebodies are located.

Within the Silmonac mine the lode is a strong flatly-dipping composite shear-fracture zone in quartzites and soft to brittle argillites. The productive part of the lode cross-section ranges in width from 10 to 40 feet - this including two parallel veins which are normally separated by 10-30 feet of lode rock, but which locally coalesce. The bulk of the mine production of high-grade silver-lead-zinc ore has come from two orebodies on the 'Footwall' vein, <sup>with local extensions to include the</sup> Gross production to date is <sup>H.W. v.m.</sup> approximately 52,000 tons, which has produced lead <sup>+</sup> and zinc concentrates of respective gross and net-smelter values of \$3,600,000 and \$2,300,000.

Current mine production is slightly over 100 dry tons per day of ore having a net smelter value - millhead basis - of about \$36.00 per ton. With total operating-exploration costs at about \$25.00 per ton, the net profit is about \$11.00 per ton of ore milled, and well below the average realized to date.

Within the past 6-8 months production demands, crew shortages, and an 1800-foot drive to furnish the required 'safety exit' have forced a severe curtailment of essential exploration-development operations. The net result of this has been to reduce the ore reserves to the point where they comprise only an 8-month assured supply of mill feed.

The most recent estimates place ore reserves at:

- (a) 'Positive' + 'Probable' category  
= 24,000 tons @ Ag, 17.5 oz./ton; Pb, 6.0%; Zn, 6.5%.
- (b) Short-Term 'Possible' category  
= 32,000 tons @ the above grade

Continued.....

- (c) Long-Term 'Possible' Category - at present productive horizon  
= 300,000 tons @ the above grade.

The writer estimates that sustained production at only 3000 tons per month, with a continued exploration program, will produce the following net incomes - after pre-production expense write-off and subsequent production royalties:

1. Assured 8-month Production Period:  
24,000 tons for Net Income..... \$ 14,356
2. Assured 8 months + Possible 6 mo. Production  
42,000 tons for Net Income..... \$ 95,048
3. Assured 8 months + Possible 10 mo. Production  
54,000 tons for Net Income..... \$168,780
4. Projected Production after 18 months  
3,000 tons/month for Net Monthly Income, incl. provision for \$1.00/ton improvement = \$24,000 per month.

In the writer's opinion, the above estimates are definitely conservative; hence, with some exploration success, and a moderate up-turn in metal prices, earnings would increase substantially.

Respectfully submitted,

*W. M. Sharp*

W. M. Sharp, P. Eng.

*WMS*

INTRODUCTION

The writer has prepared this report at the request of, and on the basis of the terms of reference suggested by Mr. G. C. Gutrath, P. Eng. on, and after mid-January, 1972. Briefly, these stipulate that the report should place most emphasis on the following:

- (a) A brief history or summary of mine development and production.
- (b) A description and evaluation of current operating practices.
- (c) Factual estimates of 'positive-probable' and 'possible' ore reserves.
- (d) An estimate of current operating profits - based on present mine performance, metal prices, and general costs.
- (e) An estimate of the net-earnings potential of the operation over the term indicated by the amount of reasonably-assured ore reserves - based on the expected operating costs and metal prices. *\* subst. net-<sup>1977</sup> cash-flow potential*
- (f) Current plans for continued exploration and development.

The writer and Mr. Gutrath visited the property on January 24, 1972 - this providing a valuable opportunity to inspect current exploration-development records and mining and milling operations.

During preliminary discussions between Mr. Gutrath and Mr. G. W. Walkey of Kam-Kotia Mines Ltd., the latter kindly gave his consent in regard to our joint inspection of the property and subsequent preparation of this report. The foregoing is duly acknowledged and, in addition, the writer takes this opportunity to express his appreciation for the kind cooperation and assistance given by Mr. Wm. Hogg, Mine Manager.

Continued.....

PROPERTY

The property comprises one block of 65 Crown-granted claims, including three held under lease. From a point closely southwest of Sandon, it extends southwesterly along the south slope of Carpenter Creek Valley, over Silver Ridge, and down the north slope of Silverton Creek valley. A  $2\frac{1}{2}$  mile strike-length of the 6-mile long main (Slocan) lode lies within the Silmonac property - this comprising a centrally-situated segment of the through-going structure. To the southwest and northeast of the 'Silmonac segment', the lode contained the former, major producing mines of the camp - the 'Standard', 'Mammoth', 'Hope', 'Silversmith-Slocan Star', and 'Richmond Eureka'.

In addition to the above-noted interval of the Main Lode, the Silmonac claims include: (a) some  $1\frac{1}{2}$  miles of the 'footwall lode' system which is locally exposed by workings on the 'Minniehaha', 'Irene', and 'Dorothy' claims, (b) most of the  $1\frac{1}{2}$ -mile strike length of the formerly-productive Wakefield lode, and (c) a gross length of at least  $1\frac{1}{2}$  miles on the Adams-Ivanhoe lode system.

LOCATION & ACCESS

The 4625 portal and mine plant situate on the south slope of Carpenter Creek Valley approximately one line-mile W.S.W. of Sandon, B.C. From Sandon, the property is reached by approximately 3 miles of good gravel road. Sandon is connected to New Denver, and Highway 6, by about 8 miles of paved-to-gravelled public access road.

The Company's mill is located on the south bank of Carpenter Creek, and closely west (down-stream) of Sandon.

Continued.....



MINE WORKINGS & GENERAL PLANT

The mine is serviced by the 4625 adit cross-cut which intersects the lode at some 2900 feet south of the portal. All of the present mine workings are situated on and above this level. Development and mining operations are carried out via a system of laterals and connecting service and stope raises. A safety exit, comprising a series of raise and crosscut segments, connects the north end of 4755 No. 1 cross cut with the Mascot adit-drift. — *Note means nature of development*

The following table lists the principal mine workings only. In the table 'feet easterly' and 'feet westerly' denote gross lengths from a N-S vertical reference plane through the 4625 cross-cut.

<u>Workings:</u>	<u>Ft.</u> <u>Easterly</u>	<u>Ft.</u> <u>Westerly</u>	<u>Ft.</u> <u>X-C.</u>	<u>Ft.</u> <u>Raise</u>	<u>Ft.</u> <u>Total</u>
4625 X-C			2960		2960
4625 Drift/Lateral	680	70			750
4690 Drift/Lateral	860	650			1510
4720 Sub-drift	70	50			120
4755 Drift/Lateral	900	320			1220
4625 No.6 Service Rse.				230	230
4690 No. 1 X-C			280		280
4755 No. 1 X-C			330		330
Exit Raise-Crosscut			950	750	1800
<b>Total, principal workings</b>					<b>9200</b>
5-West (3996) Lateral, excl X-C's	- 4100				4100

The mine plant, consisting of diesel-driven compressors and electric power units, shop, dry, timber shed, and ore bin are located next to the 4625 portal. *1977, incl 3 Wagner 2 cy scooptones - 2 on duty, 1 on stand by.*

The flotation concentrator (at 3 miles from 4625 portal), has a rated capacity of 140-150 t.p.d. of millfeed. Power is supplied by a 312 K.V.A. diesel-electric set. Current through-put is slightly over 100 t.p.d. It produces clean lead and zinc concentrates, is efficient, and effects gross recoveries (record - 9 months, 1971) of:

Ag, 96%; Pb, 95%; Zn/Cd, 91%.

Continued.....

### HISTORY

The initial stage of exploration which was carried out at the Ruth 5-level horizon, via the 5-west lateral, crosscuts, and diamond drill holes, extended from late 1963 to mid-1967. Up-holes from the west end of the lateral intersected the Silmonac ore zone at some 500 ft. in the hangingwall of the drill station. During the fall of 1967 further delineation of the ore zone was accomplished by surface diamond drilling from the East Fork of Tributary Creek.

The 4625 crosscut drive, started in late 1968, was completed by early spring, 1969. The development of the known ore zones then commenced - this being sufficiently far advanced by August, 1970 to permit ore extraction at 3000-4000 tons per month. Milling was started early in the following month. Mining and milling have continued at a fairly uniform rate since September, 1970; however, monthly exploration and development advances or mill through-put have varied in accordance with production requirements and the mine's interim production capabilities.

Lead and zinc concentrates produced to January 15, 1972 have gross and net smelter values, respectively, of some 3.6 and 2.3 million dollars. Theoretically, the gross ore potential of the Silmonac interval of the Main lode - computed on a purely statistical basis - is as follows:

$$\frac{\text{Silmonac lode length}}{\text{gross length Main lode}} \times \$75,000,000 = \$25,000,000.$$

### GEOLOGY & MINERALIZATION

#### A. Regional

The Sandon section of the camp is centrally situated within the strongly deformed corridor of (Triassic) argillaceous-quartzitic-limy rocks between the Kaslo greenstones to the northeast and the Nelson batholith on the south. The deformation has taken the form of a

Continued.....

regional-scale, composite recumbent fold ('Siocan Fold'). The un-eroded lower part of the structure within the Sandon area has an indicated amplitude of 5000 feet. The three recognizable components of this structure have been termed, going upward from its base, the 'Payne', 'Queen Bess', and 'Silver Ridge' folds or 'over-turns'. Within each, and excluding local complications, strata which dip to the southwest ('west-dip panels') are stratigraphically right-side up; similarly, those which dip to the northeast ('east-dip panels') are over-turned.

Bedding, fold axes, bedding faults, and <sup>granite</sup> sills have predominantly northwesterly trends. Dips, according to their position within the general bedding section, tend to be locally uniform - southwesterly, if within the upright limb of a specific fold; northeasterly, if within the over-turned limb; and vertical to flat-rolling, if within 'axial sections' of the structure.

Surface mapping within higher parts of the Silmonac property - specifically to the west of, above the Carnation 6100 adit - has revealed an extensive and distinctive section of easterly to northeasterly-striking, southerly-dipping beds in the hangingwall of the lode. The Silmonac mine workings rarely penetrate the hanging wall bedding section; however, the admittedly sparse but significant evidence provided by occasional box-hole and stope exposures and drill-hole intersections suggests a similar parallelism of the lode and hangingwall strata. Such bedding sections are categorized as 'lode panels'. *lode panels* (Aug 1922)

*Lodes* The district silver-lead-zinc mineralization occurs within a system of easterly to northeasterly striking, southerly dipping 'lodes' which cut sharply across the general bedding section. These are single or composite zones of shearing, fracturing, and brecciation. In gross width, they range from less than 10 feet to over 100 feet. In general, lode displacements were such that hangingwall elements of the structure have moved eastward and downward with respect to its footwall elements.

Continued.....

From studies of many former mines in the Slocan camp it has been shown, in a broad way, that the principal orebodies occurred where the lode traverses axial sections of the major bedding folds - with the ore tending to persist within the west-dipping limb of the fold, and to pinch within the east-dipping limb. With the above, zones of pronounced lode deflection provide specific local ore controls.

*Lodes*

B. Property & Mine

A long vertical section across the property shows the higher beds dipping gently, but complexly northeastward to about the 5200' horizon. Here, they roll downward, through a zone of drag-flexuring, to bend back to southwesterly dips in the vicinity of the 5000' horizon. This 'west-dip' panel appears to persist, within the more competent quartzitic beds, to at least 100 feet below the 4000' horizon. Further east on the 5-W lateral, and for perhaps 400 ft. above and below the 4000' (5-W) horizon, the bedding section consists of flatly and closely folded, sheared and faulted mixed argillites and quartzites. From the above, the writer tentatively sets the axial planes of the 'Queen Bess' and 'Payne' folds at elevations of about 5100 and 3900 feet, respectively. Allowing for the effect of lode displacements, the general hangingwall bedding structure should match the above - except where it has been warped into general parallelism with the lode, or involved within a *transverse panel.*

*or pl. 7 5050'*

Within the Silmonac mine workings, the Slocan lode appears as a broad, strong, composite shear zone traversing a complexly-folded assemblage of thickly to thinly layered quartzites and argillites which, in turn, have been intruded by sills, dykes and irregular masses of granitic <sup>rock</sup> material. Within the mine workings, the gross width of the productive part of the lode appears to range between 10-40 feet. In detail, it appears as a zone of multiple, braiding, interconnected shears between which lenticular masses of wall rock are fractured or brecciated. The lode filling is veined and cemented by quartz, siderite, and calcite.

*record to determine between the gen level and the world parts of it.*

The sulphide mineralization, consists of galena, sphalerite, minor sulpho-salts, <sup>and silver</sup> and associated pyrite and pyrrhotite; it occurs in both fracture-filling and disseminated forms. The full width of the lode is not uniformly mineralized; instead, ore-grade material tends to occur within two fairly distinct pinching and swelling layers which are referred to as the 'footwall vein' and 'hangingwall vein'. Normally, these are separated by some 10-20 feet of relatively barren lode rock, but locally merge, or converge sufficiently so that they may be mined together. With this, gross widths mined range from 1 to 20 feet - the average being about 7 feet, including normal wall-rock dilution. The bulk of the mine production derives from the footwall structure. The hangingwall vein is only locally mineable; in fact, it is only vaguely indicated by drill-holes on some cross-sections.

*cutting was lower  
or streaks of ore  
banded or led  
except was or  
or led - sulph  
lode was  
with some  
by replace.  
sulphides.*

For the most part, the strike and dip-trends of the vein have been determined <sup>from</sup> by diamond drilling <sup>hole #15</sup> from the footwall laterals and crosscuts - the data being translated as footwall vein (lode) "contours".

*These* These indicate, from west to east, a trend from easterly, to southeasterly, <sup>a flatly south plunging trend followed by a south plunging nose</sup> to northeasterly - resulting in an irregular, flatly south-plunging nose. Lode dips generally range between 10-30°. The bend in the lode appears to be the result of strike deflections through and over <sup>minor influence</sup> a transverse fault and <sup>rel stronger</sup> a section of strong porphyry and quartzite. Over the most easterly workings, the lode is trending northeasterly within weak, thin-bedded argillites; in this interval it appears 'tight' and contains only occasional lenses and streaks of ore. A more favourable structural situation is expected where the lode bends to resume its usual strike - possibly within the next 200 feet of its projected trend.

*about dip significant outcrops have been observed, etc etc, within currently delimited portion of the lode*  
The (existing) ore bodies situate on both flanks of the above-noted 'nose'. The west orebody has been mined over respective strike and dip-lengths of 220 ft. and 350 ft.; the possibility that it will extend down-dip for at least another 150 feet seems reasonably good. The east orebody has currently-developed strike and dip dimensions of about 200 ft. by 220 ft.; drill-hole intersections indicate that the ore

\* could supplement sect. w. a description of F.W. body, hole and NW bed & lode relations w. speculation re. develop of open space, etc. - The mechanics of the stress-strain relation to prod

extends for at least an additional 100 ft. up-dip. Its possible extensions below the <sup>4625'</sup>~~4725'~~ lode contour are relatively unexplored.

To date, about 60% of the mine production has come from the west orebody. Recent diamond-drill intersections on the lode over the most westerly workings indicate a possible 300-foot westerly strike-extension of this orebody; further drilling is required before estimates of the dip-extent of this ore section are possible.

The 'structural position' of the west orebody appears 'anomalous' - on the basis of the usual relationships between lode trends, <sup>bedding attitudes,</sup> relative displacements, and the localization of ore bodies. However, the writer suspects that local structural relationships are unique, in that <sup>at least</sup> a section of beds over the footwall of the lode and well into the hangingwall is essentially parallel to the lode. With this, the prevailing lode displacements could cause drag-folding and buckling - resulting in the development of favourable S.W.-pitching crumple and breccia zones.

\*  
ORE  
CONTROLS

CURRENT MINE OPERATIONS

Horizontal exploration and development is done mainly by means of footwall laterals and diamond drilling. The laterals may be defined as 'footwall drifts'. Their position, at 50-100 feet (dip-normal direction) under the footwall of the lode, facilitates diamond drill exploration of up-dip areas of the structure. A lateral can obviously be advanced faster, and at a lower cost than a drift which would in soft, heavy lode material require close support. Also, it is not necessary to drive footwall crosscuts to obtain drilling position, as is the case where drifting is employed - this providing fundamental advantages as regards net advance rates, costs, and the limited availability of skilled miners.

*also appears to  
be a H. P. method*

The up-dip exploration and development of the lode from a lateral is accomplished by box-holes and raises - the latter being driven on the footwall vein or, generally, within the footwall section of the lode. In developing a stop block, boxholes, at 75-foot centers, are driven through the vein - with chutes being installed as required. Next, if there is a sub-drift or lateral above in the mine ventilation system, a (slusher) raise is driven to connect with it. The box holes are then connected by a sill-drift, after which stoping, via slots and (10') pillars is commenced. The broken ore is slushed to the sill drift, thence to the (box-hole) chute raises. From the chutes it is loaded into ore cars, which are then hauled by battery trammer to the portal ore bin.

The mine ore is truck-transported to the mill coarse ore bin. From this bin the ore passes through jaw and gyratory crushers, through primary and re-grind ball mills in closed circuit with a spiral classifier, with the classifier over-flow passing through a lead-zinc flotation circuit. The respective concentrates are thickened, filtered, and accumulated in bins.

Both lead and zinc concentrates are truck-transported to the Bunker Hill smelter at Kellogg, Idaho via a marketing contract with British Metals Corp.

The mine operates two shifts per day and five days per week; the mill at three shifts daily and every day - excluding shut-down time for maintenance and repairs. The total work force is normally:

Staff -	10
Mine -	40
Mill -	<u>15</u>
Total -	65

The average operating costs per dry ton, based on a production rate of approximately 3000 short dry tons per month, and with an allowance for an increase in future labour costs, are as follows:

Continued.....

8 1/3 %/year

1975

Development & Mining....	\$ 9.00	—	—	—	X 1.25	11.25
Exploration.....	3.65	—	—	—	X "	4.70
Mine-mill ore haul.....	1.00	—	—	—	X "	1.25
Milling.....	6.25	—	—	—	X "	7.80
Office.....	2.15	—	—	—	X "	2.70
General.....	1.85	—	—	—	X "	2.30
<b>Average-total....</b>	<b>\$23.90</b>					<b>per dry-ton milled</b>
						<b>\$ 30.00 / d.t. milled</b>

The operation is efficient, and it is doubtful that operating costs could be substantially reduced by any alteration of the present operating practices - other than by an increase of the production rate. However, in some cases stope development costs might be reduced by restricting slot excavation to the more uniformly mineralized areas of the lode. <sup>the customary pattern</sup> Probably this could be best accomplished by a preliminary 'blocking-out' of stoping panels via wider-spaced raises and/or intermediate sub-drifts, <sup>with less drilling where this is feasible.</sup>

Also, more attention should be given towards maintaining a uniform lateral-to-lode spacing - which could increase average diamond-drilling efficiency and reduce unit drilling costs, <sup>and which might permit indirect ore-shoot detection by means of systematic rock chip geochem. tests for trace metals along strike intervals of the hole (Pg. 16, 2m. AS indicators)</sup>

**ORE RESERVE ESTIMATES**

**Definitions**

Tonnage factor = 10 cu. ft. per dry ton

- (a) 'Positive' ore = Pillars and blocks with ore exposed over most of perimeter.
- (b) 'Probable' ore = A block within or adjacent to a working stope, and which has ore exposed over 1/3 to 1/2 of its perimeter, or a block which has been fairly conclusively delineated by diamond drilling.
- (c) 'Possible' ore = Blocks which could, from geological and/or statistical evidence, be extensions of 'probable' ore blocks and/or blocks which could exist beyond the explored area of the lode where geological settings appear optimum for an ore occurrence.

*Estimates of possible are restricted to what the writer considers has been the most prolific vertical range - based on both past production and geological favourability.*

**Continued.....**



Present Ore Reserve per mine office data:

Gross Positive + Probable Ore ..... 26,000 dry tons

Net Recoverable Positive + Probable Ore - with normal dilution =

21,000 dry tons @ Ag, 17.5 oz./ton; Pb, 6.0%; Zn, 6.5%, Cd, 0.045%

Addition allowed (by writer) for hidden extensions and pillar salvage =

3,000 dry tons at the above grade, giving:

Gross Recoverable Positive + Probable Ore =

24,000 dry tons @ Ag, 17.5 oz./ton; Pb, 6.0%, Zn, 6.5%, Cd, 0.045%

The following estimates of Possible ore refer to 'local' or 'short-term' possibilities; namely, ore which could accrue from a sustained exploration effort over the next 8-18 months - at an average rate of 200 ft. of exploratory tunnelling and 1000 ft. of controlled diamond-drilling per month:

<u>Block</u>	<u>Location</u>	<u>Estimated Tons</u>
W-1	down-dip, West ore zone	8,000
W-2	up-dip, West ore zone	4,000
W-3	west extension, West ore zone	4,000
E-1	up-dip, East ore zone	2,000
E-2	down-dip, East ore zone	6,000
E-3	lode bend, N.E. lode extension	8,000
Short-Term Possible Ore (@ above grade) =		32,000 tons

Estimates of the ~~gross residual~~ <sup>or undiscovered</sup> ore potential of the Silmonac interval of the main lode are necessarily based on <sup>unexplored extent of the Silmonac segment of the main lode</sup> statistical probabilities; <sup>that relate to the particular target</sup> hence are essentially of a speculative character. However, the 'statistical-total' may be rationalized considerably by restricting the scope of the estimate to the <sup>known</sup> dip-range of the (known deposits), and by including a geological-discount factor which represents the probable frequency at which 'optimum ore situations' might occur within the unexplored extensions of the lode. The basic <sup>measurements</sup> premises, and resulting estimates follow:

*a redundant second-step or allowance.*

Apply an arbitrary but representative width of area

- (A) An Proportioned Areas of Areas of Mineral + Pennly Indicated Ore Zones  
(based on plan/level measurements) Gross Area of Standard Rich. Section Seg. of main lode  
Then apply this factor to the unexplored area of the Silmonac lode segment.
- (B) In Tons produced per measured developed lode area to date x unexplored area of Silmonac segment.
- (C) On Gross tons Produced per 100 ft strike length of Standard - Rich Section seg of main lode.

Gross strike-length of lode in Silmonac ground.... (2 1/2 mi.) = 2 mi.  
 Strike-length within mine workings..... 1/4 mi.  
 Total production to date, approx..... 52,000 tons  
 Total, positive + probable ore reserves..... 24,000 tons  
 Sub-total..... 76,000 tons  
 Geological 'discount factor'..... 0.5

Projected Ore Reserves - 'Possible' Category  

$$= \frac{2.5}{0.25} \times 76,000 \times 0.5 = 76,000 = 304,000 \text{ tons}$$
 'Rounded' estimate = 300,000 tons at above-noted grade.

NET SMELTER VALUES, LEAD & ZINC CONCENTRATES

The following calculations are based on:

- (a) Terms of the existing lead and zinc concentrate purchase agreements with British Metals Corp., Canada.
- (b) Current metal prices @ Ag = \$1.50 per oz. (unofficial spot @ \$1.55)  
 Pb = 14.5¢ per lb. (New York basis)  
 Zn = (17.5 - 0.5)¢ per lb. (New York basis)  
 Cd = \$1.75 per lb.
- (c) Treatment surcharges for pollution abatement @ 1/3¢ per lb. of contained lead and zinc in the concentrates.
- (d) Lead concentrate grade: Ag, 100 oz./ton  
 (avg. Jan. 1 - Sept. 30, 1971) Pb, 66.0% - - - 1320%  
 Zn, 7.3%
- (e) Zinc concentrate grade: Ag, 80 oz./ton  
 (Avg. Jan. 1 - Sept. 30, 1971) Zn, 54.1% - - - 1082%  
 Pb, 1.0%  
 Cd, 0.4%
- (f) Approx. parity of U.S. - Canadian currency.

Continued.....

LEAD CONCENTRATES

Payments

Ag @ 100 x 95% = 95.0 oz. @ \$(1.50-.01).....	\$141.55	
Pb @ (66.0 - 1.5)% x 95% = 1225.5# @ \$(0.145-.015)....	159.31	
Zn @ 7.3% = 146# @ \$0.0175.....	2.56	<u>\$303.42</u>

Smelter Charges

Treatment.....	\$ 23.00	
Pollution abatement, 1320# x 1/30.....	4.40	
Rep. & assaying, (per record).....	0.66	
Moisture penalty (per record).....	0.41	<u>\$ 28.47</u>
Net Value per Ton, f.o.b. U.S. Smelter.....		\$274.95

Less:

Duty on lead = (66.0 - 2.0)% = 1280# @ 0.0075 .....	\$ 9.60	
Duty on zinc = ( 7.3 - 2.0)% = 106# @ 0.0067 .....	0.71	
Freight to smelter.....	15.30	<u>\$ 25.61</u>
NET VALUE PER TON, F.O.B. MILL.....		\$249.34

57.08/7

ZINC CONCENTRATES

Payments

Ag @ 80 x 80% = 64.0 oz. @ \$1.50.....	\$ 96.00	
Zn @ 54.1% = 1082# x 85% = 919.7# @ \$(0.175 - .005)..	156.35	
Pb @ 1% - no payment or duty		
Cd @ 0.4% = 8.0# - 2.6# = 5.4# @ \$(1.75 - 0.50).....	6.75	<u>\$259.10</u>

Smelter Charges

Treatment (per sched. w. Zn @ 17 1/2%).....	\$ 56.25	
Pollution abatement = 1082# x 1/30 .....	3.61	
Rep. & assaying (per record).....	0.54	
Moisture penalty (per record).....	0.57	<u>\$ 60.97</u>
Net Value per Ton, f.o.b. U.S. Smelter.....		\$198.13

Less:

Duty on zinc = (54.1 - 6.0)% = 962# @ 0.0067 .....	\$ 6.45	
Freight to smelter (per record).....	15.66	<u>\$ 22.11</u>
NET VALUE PER TON, F.O.B. MILL.....		\$176.02

Continued.....

**NET SMELTER VALUE OF ORE - MILL-HEAD BASIS**

Production rate ..... 3000 dry tons per month  
Mill-feed grade @ Ag, 17.5 oz./ton; Pb, 6.0%; Zn, 6.5%; Cd, 0.045%  
Mill recoveries @ 96% of Ag; 95% of Pb; 91% of Zn/Cd  
Average grades of concentrates, Jan. 1 - Sept. 30, 1971 - see prev. sect.

**Calculation**

Gross recov. metal to Pb + Zn concentrates:

Pb = 3000 x 120¢ x 95% = 342,000 lbs. per mo.

Zn = 3000 x 130¢ x 91% = 354,900 lbs. per mo.

Distrib. of recov. Pb & Zn (1971 record)

Pb to lead conc. = 94.5% = 323,190 lbs./mo.

Zn to zinc conc. = 80.0% = 283,920 lbs./mo.

Lead concentrate production =  $\frac{323,190}{1320}$  = 244.8 dry tons per mo.

Zinc concentrate production =  $\frac{283,920}{1082}$  = 262.4 dry tons per mo.

Net mill-value Pb conc. per mo. = 244.8 x 249.34 = \$ 61,038

Net mill-value Zn conc. per mo. = 262.4 x 176.02 = \$ 46,188

TOTAL ..... = \$107,226

NET SMELTER VALUE OF ORE (@ mill) =  $\frac{107,226}{3,000}$  =  $\frac{\$35.74 \text{ per dry ton}}{(\text{@ above grade})}$  *at the spot metal prices.*

*- To facilitate interim field (mine) sales of the net mill-head value of ore-in-place at various proportions of Ag-Pb-Zn-Cd, the net mill-head value of Ag, Pb, Zn, etc. respectively could be calculated*

**ESTIMATES - FUTURE PRODUCTION**

The following estimates are based on:

- (a) Metal prices as used in the foregoing calculations.
- (b) Net operating expense = total operating expense less exploration expense, or  
Net operating expense = \$(23.90 - 3.65) = \$20.25 per dry ton milled.
- (c) Net smelter value of ore reserves (dil.)... \$35.74
- (d) Net-recoverable 'positive' + 'probable' ore reserves..... 24,000 dry tons
- (e) Mill through-put constant @ ..... 3,000 dry tons per mo.

Continued.....

- (f) Continuation of exploration @ min. monthly advance of 100' - 200' on laterals and crosscuts & 1000' on dia. drilling.
- (g) Currently-estim. minimum 'life' of ore reserves = 8 months.
- (h) Currently-estim. life of positive + probable + 'short term' possible ore reserves = (8 + 10.7) mo., or 18 mo. on recoverable ore.
- (i) No Federal income taxes will apply.

(j) *Local taxes incl. on gen. exp. and/or provided by \$24.08 total net op. cost*

**ESTIMATE A - for 8-month Production Period**

(With exploratory laterals & X-cuts @ 100'/mo. @ \$50.00/ft.)  
 (With exploratory diamond-drilling @ 1000'/mo. @ \$ 6.50/ft.)

N.S.V. ore milled.....		\$35.74/T
Exploration Expense per ton ....	\$ 3.83	
Net Operating Expense per ton ....	<u>\$20.25</u>	<u>24.08/T</u>
Gross Operating Profit.....		\$11.66/T
Gross Operating Profit on 24,000 tons.....		\$279,840
Less B.C. Mining Tax.....		- 25,484
Net Operating Profit on 24,000 tons.....		\$254,356
Less: Bal. of pre-production loan.....		<u>240,000</u>
Gross Earnings.....		\$ 14,356

**ESTIMATE B - for possible 14-month Production Period**

(With exploratory laterals & X-cuts @ 200'/mo. @ \$47.50/ft.)  
 (With exploratory diamond-drilling @ 1000'/mo. @ \$ 6.50/ft.)

N.S.V. ore milled.....		\$35.74/T
Exploration Expense per ton ....	\$ 5.33	
Net Operating Expense per ton ....	<u>\$20.25</u>	<u>25.58/T</u>
Gross Operating Profit.....		\$10.16/T
Gross Operating Profit on 14 x 3,000 tons.....		\$426,720
Less B.C. Mining Tax (1 year + 1/6 year).....		- 37,672
Net Operating Profit on 42,000 tons.....		\$389,048
Less: Bal. of pre-production loan = \$240,000		
Royalty on (14-8) 6 months = <u>\$ 54,000</u>		<u>\$294,000</u>
Gross Earnings.....		\$ 95,048

Continued.....

ESTIMATE C - for possible 18-month Production Period

(With exploratory laterals etc. & dia. drill @ 200' @ 47.50 & 1000' @ \$6.50)

Gross Operating Profit.....	\$10.16/T
Gross Operating Profit on 18 x 3,000 tons.....	\$548,640
Less B.C. Mining Tax (1 year + 1/2 year).....	- 49,860
Net Operating Profit on 54,000 tons.....	\$498,780
Less: Bal. of pre-production loan = \$240,000	
Royalty on (18-8) 10 months = 90,000	\$330,000
Gross Earnings.....	\$168,780

The writer considers the above estimates of gross earnings to be safely conservative. There is a good chance that they would be significantly higher if new ore discoveries reduce the operation's present dependence on pillars and peripheral ore blocks, which tend to increase dilution of the mill-feed. Also, an up-turn in metal prices may be expected by the fall of 1972, if observations by British Metals Corp. prove to be correct (ref., G.C. News Letter No. 16, 1972). *production contract (Aug/72)*

EXPLORATION POSSIBILITIES

Some of these have already been noted in the preceding text but, for convenience of reference, are included in the following text:

A - Short Term

1. Up, and down-dip extensions of the current west ore zone.
2. Westerly extension of the above zone.
3. Up, and down-dip extensions of the current east ore zone.
4. N.E. extension of the lode, in the vicinity of the anticipated sharp bend to an easterly strike.
5. Westerly extension of the lode possibly (500'- 1000') to interval containing the anticipated southerly deflection to a W.S.W. strike.

B - Long Term

1. Within the Main lode flexure, indicated by lode trends at the horizon of the Carnation 5480 tunnels, and expected at 2000' - 3000' W.S.W. of the Simmons mine workings.
2. The Carnation-Mammoth lode interval - particularly on the strike and dip-extensions of former ore zones.
3. Other lodes within the property - specifically where they traverse the optimum horizons of the 'Queen Bees'-'Payne' intervals of the Slocan Fold.

  

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*WMS*