

REPORT

on the

GEOLOGY, DEVELOPMENT & EXPLORATION

of the

SCRANTON Au-Ag-Pb-Zn PROPERTY

situated in the
Woodbury-Pontiac Creek Area

of the

SLOCAN MINING DIVISION, B.C.
(N.T.S. Map 82FL4)
Lat. 49°-47'N; Long. 117°-03.5'W.

for

Mr. Arthur J. Cassidy
Vancouver, B.C.

by

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Consulting Geological Engineer
North Vancouver, B.C.

August, 1975

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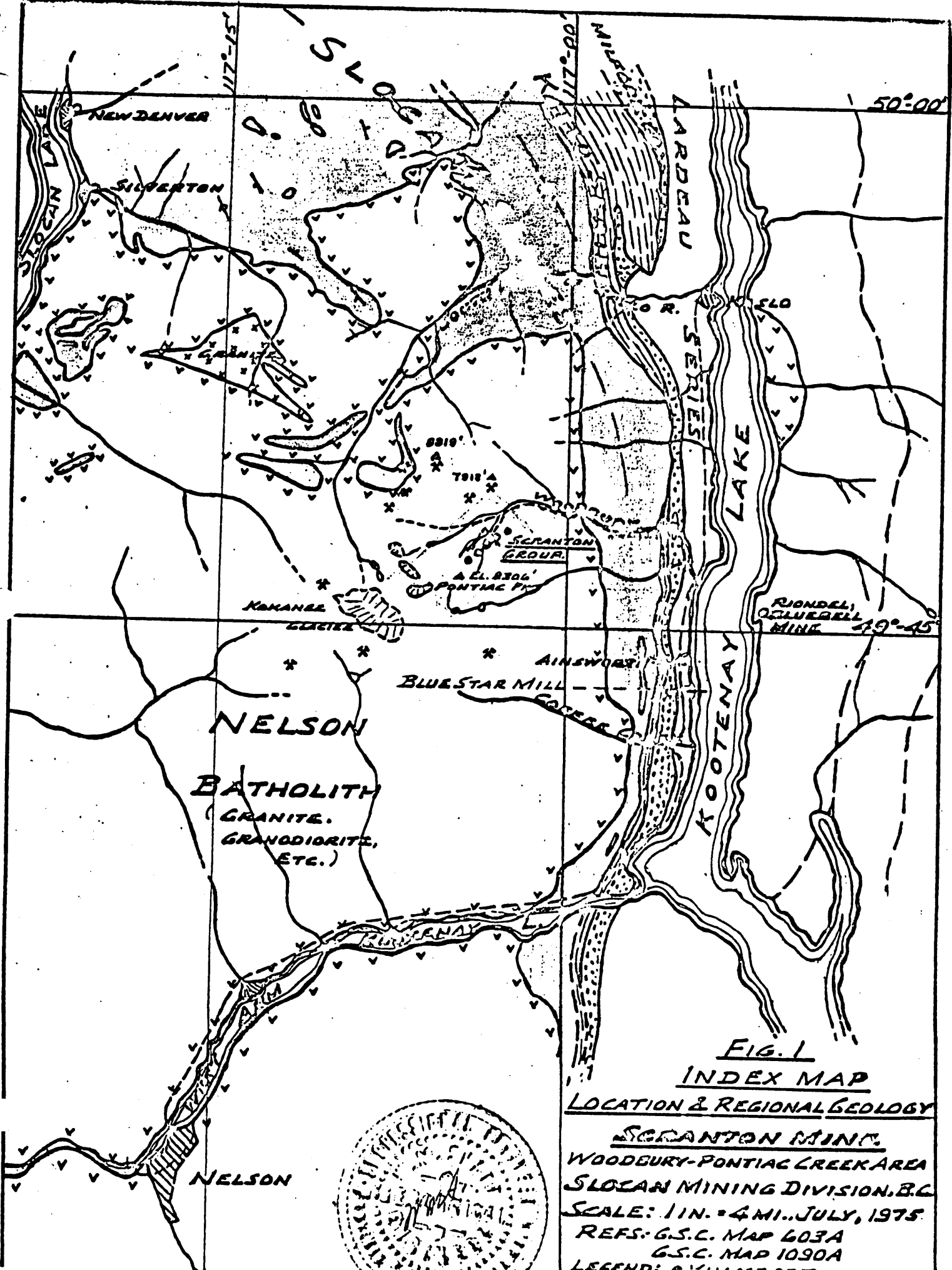


FIG. 1
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LOCATION & REGIONAL GEOLOGY

SCRANTON MINE
WOODBURY-PONTIAC CREEK AREA
SLOAN MINING DIVISION, B.C.
SCALE: 1 IN. = 4 MI., JULY, 1975.
REFS: G.S.C. MAP 603A
G.S.C. MAP 1090A
LEGEND:



SUMMARY & RECOMMENDATIONS

The Scranton Au-Ag-Pb-Zn property comprises an 8-claim group, consisting of 6 Crown-granted and 2 located claims, which covers a 1 1/2 mile strike-interval of the strong, N.E. - trending Scranton vein. Over its entire length within the property the vein lies within granitic rocks of the regional Nelson Batholith.

The mine camp, at an elevation of 5600 ft. and situating at about the center of the property, lies at about seven miles west of Kootenay Lake and eleven miles southwest of Kaslo, B.C. Access to the mine camp is by way of ten miles of secondary road which departs from the paved Nelson-Kaslo highway at about three miles north of Ainsworth.

Ore was first discovered on the property around the year 1892. From then until about 1906, small hand-mining operations were conducted at two, and possibly three rather widely separate sites on the vein - this early production being hand-sorted, horse-packed, and freighted to the former Northport, Wash. smelter.

As a result of the exploration and development work intermittently carried out from 1892 to the present time, at least six separate zones of economic mineralization have been more or less firmly indicated. In view of the favourable geological situations indicated within other little explored intervals along the length of the vein, the writer feels that other, possibly significantly larger orebodies will be discovered as a result of the diversified but thorough program of exploration and development work currently recommended. To date, the recorded production from the Scranton claim group, as a result of the relatively small-scale mining operations which were carried out during a few short periods since ore was first discovered on the

property is as follows:

<u>Period</u>	<u>Workings</u>	<u>Tons</u>	<u>Au, oz/ton</u>	<u>Ag, oz/ton</u>	<u>Pb, %</u>	<u>Zn, %</u>
1892-1906	Grandview & Upper Pontiac	1428	0.2	14.5	5.9	3.1
1949-1952	Lower Pontiac & Sunset	5635	0.22	10.0	11.9	10.6
1969-1970	West Sunset	^{Tons} 4200 for approx. 218 tons of lead concentrates and 238 tons of zinc concentrates				

The most significant operation accomplished to date, and comprising the exploration, development and initial mining of the rather recently discovered West Sunset orebodies, was carried out during two separate periods between 1967 and 1970. Development here, until work was terminated on July 31, 1970, comprised 2038 lin.-ft. of drifting and crosscutting, 667 lin.-ft. of raising, and 292 lin.-ft. of percussion-drill test-holing.

The above work was done on, and between two adits driven to, and along the vein at respective elevations of 5700 and 5900 ft. Of the 870 ft. of drifting accomplished on the 5700 level approximately 300 ft. of this has been in generally ore-grade mineralization, and on the 5900 level 250 ft. out of a total of 700 ft. of drifting accomplished on the main vein is in similar mineralization.

As a result of the development done to date over the combined 'Sunset' the 'West Sunset' ore zones, the writer estimates the ore frequency on this section of the Scranton vein to be about 30%. Also, from his knowledge of the other ore occurrences within the southwest half of the total length of vein within the property, the writer deduces an ore frequency figure of at least 25%. Relative to this, the writer estimates ore reserves within the Sunset-

Sunrise section of the vein only to comprise 54,955 tons of 'indicated' ore with a conservatively-estimated grade of Au, 0.12oz/ton; Ag, 5.6oz/ton; Pb, 6.4%; Zn, 4.4%. On the basis of the deduced figures of a 25% ore frequency for the southwest half of the structure, the writer estimates a 'geologically-inferred' ore reserve of about 335,000 tons of approximately equivalent grade within this half of the vein only. Undoubtedly, a significant tonnage of ore currently assigned to the "possible" category, lies within the northeast half of the vein; however, the current exploration and development data are insufficient for purposes of tonnage/grade estimation at this time.

The immediate development/mining target, within the West Sunset section of the vein comprises some 28,000 tons of partly-developed indicated ore within three separate ore shoots with a conservatively-estimated grade of Au, 0.196oz/ton; Ag, 6.2oz/ton; Pb, 6.5%; Zn, 6.1%; Cd, 0.12% - based on the assumption of minimum mining-widths of 3 1/2 to 4 ft. For this ore reserve the writer estimates the following values, with due allowances for concentrate trucking and smelting charges and B.C. mining royalties:

Net Smelter Value per ton of Ore	\$82.40
Net Mill Head or Mine Value/ton	\$74.72

After an estimated gross mining and milling cost of \$39.78/ton, at a 2500 ton per month rate, is deducted a gross operating profit of \$34.94/ton results.

Mining and milling the currently most accessible West Sunset ore blocks, with due allowances for pre-production costs should result in a total net operating profit of about \$690,000. Extraction of all of the West Sunset ore blocks could, quite probably, return a profit approaching \$920,000.

*on ore outlined
a 50,000 tons.*

On the basis of the above currently-estimated short-range profit potential within the West Sunset section of the mine alone, and in view of the magnitude

*portion of
value is to
be property
production.*

of the geologically-inferred ore reserves, the writer believes that the payment of \$250,000 to acquire a 70% interest in the property is justified and recommends that first work be carried out within the relatively more accessible underground workings and surface areas.

Phase I

- (a) Advance the Lower Pontiac drift 200 ft. eastward and prepare a diamond drill station.
- (b) Carry out short-hole diamond drill exploration of probable and possible extensions of ore and mineralization within the West Sunset-Lower Pontiac vein interval.
- (c) From the West Sunset 5900 level, near sta. 10, drive 150 ft. of raise for further exploration of the main ore shoot.
- (d) Advance the 5900 drift for 50 ft., cut drill station, and drill for exploration of the west extension of the vein.
- (e) Carry out preliminary delineation of the Lower-Upper Pontiac vein interval via VLF-EM survey methods.

Phase II

- (a) Resume development of West Sunset ore blocks, for either immediate or later ore production, and initiate development of such other ore blocks/ore zones as may be indicated by the exploration recommended in Phase I.
- (b) Contingent on Phase I (d) results, advance 5900 drift 750 feet for depth exploration of the Grandview-Sunrise Basin ore zones.
- (c) At face of 5900 drift, crosscut 320 feet into footwall, prepare drill station, and test up-dip areas of vein by diamond-drilling.

ESTIMATED COSTSPhase I

(a)	200' @ \$80/ft., plus 2 'slashes' @ \$400 ea.		\$16,800
(b)	Approx. 2000' @ \$7.50/ft. <i>drill</i>		15,000
(c)	Two-compart. raise, 100' @ \$120/ft. - 12,000	<i>above level.</i>	
	Boxhole raise, 5' x 6', 50' @ \$ 60/ft. - <u>3,000</u>	<i>5900 level.</i>	15,000
(d)	50' @ \$80/ft. plus 1 'slash' @ \$500 - 4,500	<i>initial</i>	
	200' drill-hole @ \$7.50/ft. - <u>1,500</u>	<i>5900 level</i>	6,000
(e)	General estimate: Grid, 5 mi. @ \$150 - \$ 750	<i>low level.</i>	
	<i>VLF. E.M.</i> Survey, 5 mi. @ \$200 - <u>\$1,000</u>	<i>initial</i>	1,750 ?
(f)	Provision, omissions and contingencies @ 20% approx.		10,950
	Total Direct Cost, Phase I		<u>\$65,500</u>
	Total Indirect: Property Payments, etc.		\$250,000

Phase II

(a)	Estimate initial phase @ 25% of the estimated gross cost of development of the West Sunset group of ore blocks		\$ 57,675
(b)	750' @ \$80/ft.		60,000
(c)	320' @ \$80/ft. <i>320' x 20' x 20' = 128000</i>	\$25,600	
	Drill Sta. Preparation	1,000	
	Dia.-drill; estim. 1500' @ \$10/ft. <u>15,000</u>		41,600
(d)	Provision omissions and contingencies @ 15% approx.		24,000
	Total, Phase II		<u>\$183,275</u>

Respectfully Submitted,

W.M. Sharp

 W.M. Sharp, P. Eng.



INTRODUCTION

Following a general discussion of the property with Messrs. Cassidy and Martin in early June, 1975 the writer received a letter from Mr. J.T. Martin, P. Eng., which formally authorized him to prepare for, and carry out a field examination. The latter was accomplished, partly in Mr. Cassidy's company, during the period June 19th - 25th, 1975. The above-noted letter also provided the essential terms of reference pertaining to the writer's field examination and subsequent report.

In the course of his field examination the writer inspected all of the accessible, significant workings and vein exposures within the West Sunset section of the Scranton property, up-dated his geological mapping of specific exposures, sampled accessible ore exposed in the backs of stopes above the 5700 and 5900 levels, and explained and discussed matters relating to the general ore potential and exploration/development possibilities with his client. Particular note was taken of the tenor and width of vein exposures within various parts of the stopes and of the stope-widths resulting from the most recent mining operations.

At the time of the examination, the upper intervals of 57-59 raise and of both exploratory raises in mine block A-2 were not reasonably accessible; hence could not be re-examined or check-sampled. However, the foregoing is not considered to be a serious omission, as all had been previously surveyed and sampled by qualified personnel.

In the preparation of this report most of the pre-existing sample data and ore reserve estimates have been re-assessed and recalculated on the basis of current

metal prices, current mining-milling-development costs, and on the assumption that all mine operations will be efficiently organized and accomplished.

The willing and helpful assistance provided the writer by Mr. Cassidy, and Messrs. Bob Golac and Tom Stephanic is hereby thankfully acknowledged.

PROPERTY LOCATION, ACCESS & WORKINGS

The Scranton property locates at about seven miles due west of Kootenay Lake and eleven miles southwest of Kaslo, B.C. The long dimension of the claim block bears in a S.W.-N.E. direction, which is also the average trend of the Scranton vein; also, it straddles Pontiac Creek, which is a north-flowing tributary of upper Woodbury Creek. Pontiac Creek approximately bisects the property and situates at the lowest point of (covered) outcrop of the vein. From this point the surface slopes steeply upward to the southwest, and moderately upward to the northeast.

The mine camp, situating within the small area of flat ground bordering Pontiac Creek, lies at an elevation of approximately 5600 feet. The Lower Pontiac and Sunset adits, respectively, locate closely east and west of Pontiac Creek.

Access to the mine camp and main portals area is by way of ten miles of secondary road, which departs from the Nelson-Kaslo highway at about three miles north of Ainsworth (3 1/2 miles north of the mill near Ainsworth) and ascends westward up Woodbury Creek valley.

The various workings, which were put in to explore the Scranton at intervals along its 1 1/2 mile gross strike-length within the property are shown on Drawings 75-1, -2A and -2B.

To date, mineable widths of gold-silver-lead-zinc mineralization, more-or-less exposed by the existing underground and surface workings, have been opened over general vertical range of 1150 feet. The present evidence suggests that ore-grade mineralization might be expected to persist to significantly greater depths.

The Lower Pontiac, Sunset and West Sunset 5700 and 5900 level workings are fairly easily accessible by road. Several years ago a "cat road" was pushed through to the Upper Pontiac portal area; however the road has since deteriorated and is now, except for foot-travel, impassable. The old Grandview and S.W. Sunrise mine workings and 1953 drilling area all lie within the general Sunrise Basin area, which centers on a point at roughly one-half mile southwest of, and 800 feet above the mine camp. Currently, access to this general area is by foot-trail or helicopter.

CLAIMS

The writer has been advised that there have been no important changes in the claim group over the past five years. Hence, the group of eight contiguous claims essentially consists of the 'Granite'-L.6278, 'Sunrise'-L.5991, 'Grandview'-L.6279, 'Scranton'-L.7452, 'Pontiac'-L.2265, and 'Tecumseh'-L.2261, Crown-granted claims and the 'Big Ed' (Rec. No. 10096) and 'Scranton Fr.' (Rec. No. 1011) located claims. The writer has not personally searched the B.C. Department of Mines records to determine whether or not some of the above have been re-staked since 1971. Also, the writer has been verbally advised that all claims comprising the Scranton group are in good standing.

MINING AND MILLING FACILITIES

Currently, the system of access/development crosscuts, drifts, and raises which open the West Sunset ore zone comprise the most valuable item of mine plant. Other items include the mine camp which consists of three portable (trailer) buildings for a small mine crew, an old framed building which would provide light storage capacity, two or three smaller framed buildings which might serve as shops, and the compressor/powerhouse near the 5700 portal. This camp, with minor repairs and additions, would be quite adequate for the envisaged exploration/small-scale mining program.

Useable mechanical equipment includes one 500 and one 600 and one 210 c.f.m. compressors, air receivers, one 25 kW and one 4 kW diesel-electric units, two steel sharpeners, four stopers, and five jack-leg rock drills, two Einco 12 B mucking machines, two battery-powered mine locis or trammers, battery chargers, seven side-dump and two end-dump ore cars, two or three timber cars, an underground (small) diamond drill, a variety of small tools, one 1 1/4 c.y. front-end loader, one light pick-up truck and one 4 x 4 six-passenger truck. Mine supplies comprise a small amount of useable mine timber, 20-lb. rail, 2" - 4" pipe, miscellaneous machine and equipment parts, and ten track switches and frogs.

In accordance with the formal agreement between Silver Star Mines Ltd. (N.P.L.) and Mr. Arthur J. Cassidy, the latter will have the use of the former's flotation concentrator and all moveable mine plant, spare parts and supplies that the former has procured for the purposes of operating the property. The capacity of the Blue Star mill appears to have been reasonably rated at 150 tons of coarse mine ore per day. It operates on the locally available hydro-electric public power supply.

HISTORY AND PRODUCTION RECORD

The first ore discoveries within the ground now lying within the boundaries of the present Scranton claim group were made about the year 1892 and apparently located within the vein interval containing the old Grandview mine workings. Ensuing production from the oxidized ore zone opened by the two westerly adits amounted to about 60 tons of hand-mined and sorted material; however, on the basis of the apparent vein area stoped and the size of the mine dumps, the writer judges that the actual production was substantially larger than the reported production. Recorded production from the Upper Pontiac workings (Pontiac and Tecumseh claims) is 1368 tons from intermittent hand-mining/sorting operations between approximately 1898 and 1906. The above production and, very possibly, some additional ore which was apparently derived from as-yet-unmapped surface workings on the Granite claim, was raw-hided and horse-packed to Kootenay Lake; thence transported by boat and hauled over-land to the former Northport, Washington smelter.

The various separately-owned claims were purchased by a Portland, Oregon group in about 1929 and subsequently consolidated via Scranton Mines Ltd.

Between 1939 - 1948, Scranton Mines Ltd. built an access road up Woodbury Creek, and commenced surface and underground exploration of the Lower Pontiac vein interval. Between 1948 - 1953 this same company developed and mined the near-surface parts of the Lower Pontiac and Sunset orebodies - trucking the ore to local concentrators, where it was milled on a custom or toll basis. Considerable revenue derived from this production; however, it was largely dissipated on concurrent and generally-random exploratory work.

Since 1952 the writer has provided intermittent geological/mining consulting services - first to Scranton Mines Ltd. and later to Silver Star Mines Ltd. During this period the writer surveyed and mapped most of the accessible workings, and personally sampled or check-sampled parts of all of the main underground and surface vein exposures.

Exploration and development of the West Sunset (originally termed '6040') vein interval was started in 1967 with drifting on the 5900 level and, with lengthy interruptions, continued until July 31, 1970, when inadequate financing forced a cessation of drifting and mining on and from both the 5700 and 5900 levels.

The following is a summary of the recorded ore production from the area now comprising the Scranton claim group.

<u>Period</u>	<u>Source</u>	<u>Tons</u>	<u>Au.oz/ton</u>	<u>Ag.oz/ton</u>	<u>Pb.%</u>	<u>Zn.%</u>
1892-1906	Grandview & Upper Pontiac	1428	0.2	14.5	5.9	3.1
1949-1952	Lower Pontiac & Sunset	5635	0.22	10.0	11.9	10.6

During the 1969-1970 period 4200 tons of low grade which largely derived from development produced some 218 tons of lead concentrates and 238 tons of zinc concentrates. Part of this derived from stopes started from the 5700 and 5900 levels (A-1 & A-2 ore blocks).

The following is a summary of exploration and development work accomplished within the West Sunset section of the property between 1967 and 1970:

<u>Level</u>	<u>Drifts & X-Cuts</u>	<u>Raises</u>	<u>Percussion-Drill Exploration</u>	<u>Diamond-Drill Exploration</u>
5700	1058 Lin. ft.	337 Lin. ft.	nil.	nil
5900	980 Lin. ft.	330 Lin. ft.	292 Lin. ft.	nil
Totals	<u>2038 Lin. ft.</u>	<u>667 Lin. ft.</u>	<u>292 Lin. ft.</u>	<u>nil</u>

Between the east end of the Sunset workings and the west face of the 5900 level the percentage of the gross strike-length of structure comprising ore-grade material, herein designated as the lateral ore frequency, is scaled at 29.5%. However, the writer prefers to estimate the ore frequency over the whole Sunset-Granite vein-interval as more probably being about 25%.

GEOLOGY & MINERALIZATION

General

On its general northeasterly trend, the Scranton vein/lode traverses an easterly rim zone of the regional 'Nelson' granite-granodiorite batholith. This structure, comprising a strong zone of shearing and fracturing, has been quite continuously exposed over a 1 1/2 mile strike-length between the respective ends of the 'Upper Pontiac' and 'Granite' workings. The present geological evidence suggests that potentially ore-bearing extensions of the structure occur to the southwest and northeast.

Along its strike (and dip) the Scranton structure occurs principally as a single mineralized fissure (vein), and locally as a more-or-less mineralized multiple vein zone (lode). Typically, the granitic wall rocks and/or inclusions of wall rock in the vein or lode are highly fractured and moderately to strongly altered - the latter involving additions of silica (quartz veining and silicification), kaolin, sericite, and pyrite and,

more rarely, chlorite. Locally, as within the 6040 adit and outer section of the 5900 adit, predominantly pyritic (soft, fine-grained gray type) material contains important amounts of gold and silver. This may comprise a second phase of pyrite mineralization, or may only consist of a better mineralized, crushed and softened part of pyrite mineralization of one age.

The vein/lode has a general northeasterly trend, with southeasterly dips ranging on the average between 40° - 90° . Within the Lower Pontiac section low to flat-rolling dips occur where the vein approaches and traverses a major flat-lying inclusion of altered 'Slocan' sediments. Some 1500 - 2000 tons of high-grade ore were mined from this warped, flatly ($15-25^{\circ}$) dipping vein segment.

Galena, sphalerite, and pyrite, with associated sulphosalts, occur with more-or-less quartz as massive, or banded-to-bunchy fillings. Mineable vein intervals normally range between 1 - 5 feet in width. Diamond-drill exploration of the Sunrise Basin segment in 1953 indicated local widths in excess of 10 feet where the vein 'split' to form a lode comprising two to three moderately well mineralized strands. Average vein widths in the West Sunset section are in the range of 2 1/2 to 3 feet.

The accumulated sampling records show gold and silver values in ore respectively ranging from trace to 2.36 oz/ton and trace to 70.8 oz/ton - the significant feature of these being that the gold and silver content is often not proportional to that of lead and zinc in the same sample. Locally, high gold-silver values are found to occur with low to trace lead-zinc values; therefore, sampling of all occurrences of lead-zinc-pyrite, or pyrite alone is mandatory - particularly where the latter occurs as the soft greyish material noted above.

The following assays of 'average grade' to 'specimen grade' vein material are from samples taken by Scranton Mines Ltd. fieldmen and others examining the property between 1929 - 1952, and from samples taken by the writer during 1952 - 1967. These illustrate the variability of Au-Ag content, and its local proportionality to, or independence of the Pb-Zn content of the mineralization:

<u>Source</u>	<u>Au,oz/ton</u>	<u>Ag,oz/ton</u>	<u>Pb,%</u>	<u>Zn,%</u>
Sunrise dump	0.12	4.0	3.9	2.4
'Scranton' dump	0.46	40.8	48.1	3.2
'No. 2 Vein', above Scranton	0.20	11.6	19.5	1.3
Float from 'No. 2 Vein'	2.36	16.2	11.3	12.1
Sorted ore, all dumps	0.34	65.6	60.6	8.4
'Millfeed', Scranton Vein	1.32	14.2	13.9	4.6
'Shipping Ore', Scranton Vein	0.04	70.8	81.0	0.5
5900 level (WS/C.L.)	0.52	10.8	13.5	16.6
Sunset Stope Sill (W.S.)	0.20	10.0	8.0	6.0
Sunrise dump (W.S.)	0.92	10.05	11.0	12.7
L. Pontiac, 2-Level (W.P.)	1.14	11.2	1.9	2.2
Sunrise Open Cut (W.P.)	1.92	2.9	0.2	0.08
W. Grandview dump (W.S.)	0.36	1.8	Trace	Trace
Klondyke Cr. outcrop	0.12	63.20	3.8	—
Blanket Vein, U. Pontiac	0.08	31.80	Trace	2.8
" " " "	0.04	23.6	0.3	0.2
Scranton outcrop	1.48	Trace	18.2	-

Productive parts of the vein normally range between one and five feet in width, with fillings varying between massive, to banded, or patchy; within multiple-vein sections, widths locally exceed 10 feet - comprising quartz with minor, alternate bands and patches Pb-Zn-Fe sulphide.

Detailed

Drawing No. 75-1 supplements the following text.

Sunset-Lower Pontiac Interval

This segment of the lode lies within the Big Ed and Scranton claims, and is centrally situated with respect to the presently-delineated gross length of the Scranton vein system. Topographically, the lode section straddles Pontiac Creek basin, which comprises a broad central trough within the overall lode profile; consequently, development workings in this zone penetrate the lowest structural horizons thus far actually explored. The gross known, and inferred strike-length of the Sunset-Lower Pontiac productive zone is about 2000 feet. Within this only an 800-foot length of the zone, has, to date been effectively explored by the present pattern of exposures and workings. The segment is generally delimited by the strong N.N.W. - trending shear zone near the inner (west) end of the Sunset main level and the N.W.-striking, S.W.-dipping(70°) fault locating at about 100 ft. northeast of the N.E. side of the Scranton M.C.

From the Sunset west fault, the vein trends northeasterly through the workings, and swings to an average E.N.E. course across the Sunset - Pontiac gap and through the Lower Pontiac workings. The easterly end of the vein interval is marked by a broad southward bend and progressive transition to a barren

graphitic shear striking southeasterly and dipping about 40° southwestward. At the surface, the vein is successively displaced some 150 feet southward, on at least two (78° S.W. and 70° S.W.) N.W. - striking faults, with the second offset segment trending on a general E.N.E. course to enter the westerly part of the Upper Pontiac vein interval. The corresponding positions of these vein segments at the main tunnel horizon have not yet been established; it appears that this can be accomplished by drill holes from both the Lower Pontiac 5639 level and/or the surface.

Vein dips are steeply southward throughout the Sunset workings and, presumably, for some fraction of its strike-length across the unexplored Sunset - Pontiac gap; however, the vein warps to significantly flatter dips prior to entering the Lower Pontiac mine tunnels, and continues as a well mineralized, sinuous, flatly-dipping structure through the drifts and stopes of the westerly mine workings. Throughout the above interval the vein lies between normal granitic walls; the above-noted warp from steep to flat dips is due to deflection of the vein on its approach to, and its passage through a large (mine-scale) flatly-lying and crumpled inclusion (lens) of baked limey-argillaceous ('quartzitic') sediments. At roughly 300 feet inward of the top portal the vein enters this panel, where it becomes a 'bedded' structure of no marked strength or trend - and no significant degree of mineralization. Underground, the vein was lost within this panel; however, there is no doubt that the interruption is a local effect, and that the strike and dip extensions - which constitute worthy exploration targets, can be defined by further exploration.

The vein, with a normal N.E. trend and 60° - 70° southerly dips, continues on the surface over the bedded panel; in the writer's opinion, the depth-extensions of the vein below the horse and its strike-extensions east of it should re-enter granitic rocks - in which it may be expected to continue as a more 'open'

structure with improved ore potential. It is also possible that one, or more 'blind' ore shoots may occur within the 150-foot vertical interval between the mine 'horse' and the surface. In regard to its depth extension below the 5600' horizon of the Lower Pontiac and adjoining intervals, there is a good possibility that the flat sedimentary inclusion may constitute an effective structural trap for ore.

In detail, the depth extensions of the vein segments exposed by the northeasterly trenches require much more exploration than has been so far accomplished by the present pattern of short surface trenches, and two widely separate diamond-drill holes (#12A and 13A). The first exploration target comprises the vein interval adjacent to the 78° W. cross-fault, and which was inconclusively tested by D.D.H. #12A. The second involves both of the faulted segments to the northeast. Within the first (short) segment a sample across the No. 8 trench exposure assayed 1.2' @ Au, 0.18 oz/ton; Ag, 17.4 oz/ton; Pb, 25.8%, Zn, 0.2%. On the second (west end of Upper Pontiac vein interval) - tested by only three trenches, the vein comprises 12" - 30" quartz with sparse galena - pyrite mineralization (not sampled). In view of its favourable northeasterly trend, its encouraging width, and its proximity to one, or more favourable vein-fault intersections, this segment particularly warrants eventual diamond drilling from both surface and underground. Surface exposures over the east end of the main tunnel are 350' vertically above it - with the vertical interval increasing northeastward on strike towards the Upper Pontiac mine area. A large part of this vertical section could be explored via drill holes from the inner end of the Lower Pontiac 5639 (main) level.

The series of flat exploratory holes drilled (1951-1953) from the Lower Pontiac main level was entirely unsuited for testing possible dip, or faulted vein

NB

extensions above or below tunnel horizon; hence, did not accomplish any useful purpose.

The productive 200-foot Sunset vein segment averaged 3 1/2 feet in width - locally expanding to 7 feet. Mineralization comprised banded to bunchy Fe-Pb-Zn sulphides in quartz and fractured, silicified granite. The average grade across normal mining widths is estimated at Au, 0.20 oz/ton; Ag, 10.0 oz/ton; Pb, 8%, Zn, 6%. The writer estimates an additional 50 to 100 feet of ore of similar grade down-dip, plus further inferred extensions; he also infers additional material of mineable grade on the immediate northeasterly vein extension.

The Lower Pontiac orebody had a gross strike-length of about 150 feet within the lower adit, with an average mined-length of about 80 feet. The flatly-dipping ore lens ranged from 1 to 3 feet in thickness; much of the vein comprised near-massive sulphides - with about equal proportions of Pb-Zn sulphides and pyrite - the latter containing significant, to locally impressive gold values. The writer infers some additional ore below and to the west of the portal section - possibly on a westerly-plunging vein-warp. N.B.

The combined Sunset - Lower Pontiac production (1948-1953) is estimated at 5600 tons of ore averaging: Au, 0.22 oz/ton; Ag, 10 oz/ton; Pb, 11.0%; Zn, 10.6% - the latter containing a significant amount of cadmium.

Upper Pontiac Interval

This section comprises the 2000-foot strike interval of the Scranton structure lying within the northeast end of the property and, more specifically, within the Scranton Fr., Pontiac and Tecumseh claims. To date, only the easterly

800-ft. part of it, containing the old Pontiac Peak mine workings, has been explored to an appreciable extent. The Pontiac Peak lode segment is considered to be the northeasterly strike extension of the Sunset - Lower Pontiac vein system; however, the map position of this northeasterly segment, which is some 400 - 500 feet southeast of its projected position, can be explained as either the result of a major, but temporary easterly deflection of strike as it passes out of the Lower Pontiac area, or as the result of successive right-hand fault offsets. The writer favours the latter interpretation, on the basis of the frequency of similar (Slocan mode) fault-offsets along better known intervals of the general Scranton structure. Vein-dips at each end of the interval are steeply (sub-vertical) southeast; probably, these are representative of the unexposed intervening sections.

Present evidence suggests that the Upper Pontiac orebodies occurred along a uniformly N.E.-striking 400-foot length and 200-foot dip-section of the lode. The ore zone evidently cut-off (or pinched) to the east on an E-W striking, 65° south-dipping cross-fault. The writer suspects that the vein only temporarily deflects on this cross-fault, then resumes its northeasterly trend beyond the property boundary. If this is the case, a favourable structural-mineral situation, comprising a vein-deflection, is indicated.

The productive section of the vein evidently consisted of a wide composite shear zone within the granitic (locally migmatized) country rock. Cairnes notes (1927), "this contains a number of quartz veins and stringers, most of which carry more-or-less — galena, zinc blends, pyrite, and high-grade silver minerals. One vein — carries disseminated sulphides as well as pockets, or small shoots of higher grade material. The appreciable gold

content forms an attractive feature."

The total recorded production (1898-1906) is given as 1368 tons @ Au, 0.2oz/ton; Ag, 15oz/ton; Pb, 6%; Zn, 3%. An inspection of the dumps indicates that a significant proportion - comprising mixed Pb-Zn sulphide in quartz (and siderite) gangue was rejected during sorting; evidently much of this reject was left, as backfill, in the stopes.

The writer's sampling (grid pattern) of the accessible top (weathered) 2' - 3' of the dumps allows the following, more-or-less representative, estimate:

2000 tons @ Au, 0.07oz/ton; Ag, 3.25oz/ton; Pb, 1.7%; Zn, 1.6%

Previous (1931) sampling, by others, of presumably less-weathered, higher-grade dump sections is reported as:

Au, 0.04oz/ton; Ag, 7.6oz/ton; Pb, 12.5%, Zn, 25.1% - with no estimate of tonnage.

The separate sample data suggest that the ore minerals could not be readily separated by hand-sorting procedures; consequently one may infer that a considerable tonnage of mixed-sulphide ore must have been left underground and that mining was terminated on reaching such material - possibly within the lower easterly workings. For this, and previously-noted geological reasons, the writer infers an extension of the ore zone below and/or northeast of the easterly stopes. The 1954 E.M. survey results indicate conductive zones within the hanging wall of the productive section; however, in view of the limited depth capability of the equipment then used, it would be advisable to eventually re-run this, and other grid areas - employing modern equipment and techniques.

West Sunset-Grandview Interval

Drawings 75-1, -2A, -2B, -3 supplement this section.

This particular lode interval lies within the Grandview and west half of the Big Ed claims. Geologically, it is limited by the Sunset and Grandview cross-faults - both N.N.W.-striking, steeply-dipping structures which effect respective major and minor displacements of the vein system.

Between the Grandview and Sunset cross-faults, the gross strike length of the lode segment is about 1500 feet. Its vertical range, between the Sunset workings and Grandview ridge, is close to 1200 feet; the gross dip-extent would be in the order of 1300 feet. To date, this lode segment has been partly explored and developed over a net strike-length of about 900 feet - principally at the 5700' and 5900' horizons of the structure. The 40-foot long '6040' adit lies within the general '5900' lode segment.

To date, drifting on the 5900 level has directly exposed consecutive ore shoots over 70-foot, and 180-foot drift lengths; the gross indicated-length of these is about 260 feet, containing good mineralization over actual widths ranging between about 1 - 3 1/2 ft.

Drifting on the 5700 level has opened consecutive 45 ft. and 227 ft. lengths of mineralization - these comprising the 250 ft. dip-extensions of the ore zones intersected by the 5900 drift. Within the smaller outer shoot the actual ore widths range between 0.8' and 2.3' - excluding slightly altered mineralized wall rock sections; the inner drift samples on the inner (A-1) ore shoot were computed at 227' x 2.86' @ Au, 0.15 oz/ton; Ag, 5.7 oz/ton; Pb, 6.1%; Zn, 4.4%. The better mineralized vein-intervals on both the 5700

and 5900 levels strike $N45^{\circ}E$ and dip at an average 55° southeast. Drifting on both levels was stopped due to a lack of finances, and not because of any real evidence that mineralization would not continue beyond both faces.

The vein within the old Grandview east drift (el. 6623') consists of 3-foot wide zone of crushed granite-sparsely veined by quartz, and containing minor pyrite; the writer does not have any records of possible sampling in this working but in view of its ridge-top location, this is not thought to be a critical omission.

Granite-Sunrise Interval

Drawings 75-1, -2A, -2B supplement the following text.

This vein-lode section is about 1600 feet long, and extends from the crest of Grandview ridge (loc. cross-fault) to the most southwesterly Sunrise trench.

The lode maintains a fairly consistent southwesterly strike through the old westerly Grandview workings, Sunrise Basin, and through the outer half of the S.W. Sunrise adit; within the inner half of this adit the vein bends to a more southerly strike. Over these same intervals the dip changes from near vertical, to steeply northwest, to steeply and moderately southwest.

Probable, and potential ore grade material is indicated and inferred, within three distinct sections, for a total length of approximately 640 feet, or over roughly two-fifths of the delimited length. To date the most firmly indicated section comprises the (indicated) ore shoot opened by the inner half of the S.W. Sunrise drift, and which is noted as coinciding with a local, but typically-favourable southerly lode deflection, or warp. The

Sunrise Basin (indicated) ore shoot is less strongly mineralized, but is significantly wider, and different in several respects. - mainly, in that the Sunrise drift ore comprises quartz and massive-banded Fe-Pb-Zn sulphides in about equal proportion, whereas the drill-indicated 'Basin' ore shoot apparently consists of predominant quartz and bleached silicified and sericitized fractured granite, with a smaller proportion of sulphides disposed as erratic veins and gobs. However, there is a fair possibility that the proportion of sulphides to quartz increases at depth on the latter ore shoot.

From close-spaced channel sampling of the drift mineralization and supplementary surface sampling, the S.W. Sunrise exposure is calculated at:

190' x 2.3' @ Au, 0.092 oz/ton; Ag, 3.27 oz/ton; Pb, 9.1%; Zn, 5.1%

The Sunrise Basin 'indicated' ore block is computed from the following (1953) diamond drill hole intersections:

Hole No.	Indicated Width, ft.	Oz/ton Au	Oz/ton Ag	% Pb	% Zn	Notes
3	6.0	0.039	4.9	4.0	1.1	multiple veining
5	10.0	0.035	8.1	5.5	0.9	" "
6	2.3	0.030	7.0	5.1	0.6	'hanging wall' vein
9	10.5	0.020	7.0	7.0	4.2	multiple veining
* 7	5.0	0.030	6.5	4.5	0.85	one vein
* 11	4.2	0.020	4.2	2.8	3.1	'footwall' vein only
Avg. 180' x 170' x 6.76' @		0.03	6.9	5.5	1.9	- weighted average

* Holes #7 and #11 are not directly included in the computation, but serve to adjust the average of the 4 contributing holes, and to define the limits of the 'indicated' block.

The above assays may, or may not be representative, in view of the generally low core recoveries made; however, the writer assumes that they have been averaged conservatively, and that the true gold content will be greater, or more in accordance with the generally-indicated range for Scranton ore. Holes #7 and #11, viewed in relation to the 'indicated' zone, allow inferences of vertical and lateral extensions.

A 'geologically-inferred' ore block below the Grandview westerly workings is deduced from fragmentary, but significant intersections made by d.d. holes Nos. 1 and 2, from the reported grade and probable extent of ore originally derived from the westerly part of the old Grandview mine, from the fair possibility of continuity with the 'Basin' ore zone, and from its generally-favourable geological situation. Hole No. 1, in near surface position, intersected loose rubble containing some thoroughly oxidized vein material only. Hole No. 2, with a relatively deeper penetration, intersected a 7-foot section of oxidized, pyritized granite, pyrite, and soft, oxidized material containing some fragments of galena. The weighted average of consecutive 5 ft. and 2 ft. 'core samples' d.d.h. No. 2 amounted to Au, 0.18 oz/ton, and Ag, 4.0 oz/ton.

Sunrise - Granite Interval:

This comprises a generally unexplored interval between the S.W. Sunrise trenches and the west boundary of the property. Some old trenches, not seen by the writer, are reported to have been made on a displaced vein, or lode segment. The writer thinks it highly probable that the lode extends the additional 1000 feet to the west boundary of the 'Granite' claim; he also infers that at least the initial part of this will trend similarly to the inner S.W. Sunrise vein section - with a fair possibility that some additional

ore of similar character occurs on this structurally-favourable trend. However, the writer does not, as yet, think it advisable to translate this potential in terms of specific additions to the 'geologically-inferred' ore reserve category.

ORE RESERVE ESTIMATES

Preliminary Statement

The current ore reserve estimates are based on the same sample/assay data as were used for the writer's July, 1971 estimates. However, because of significant changes since then in respect of metal prices, smelter charges, mining (labour and material) costs, less favourable government tax concessions, and restrictions and charges on profit, the writer has considered it absolutely necessary to recalculate the ore reserves on the basis of the current economic situation.

In this report the various local reserves or 'ore blocks' are defined and designated as follows:

- 'Indicated' - Ore blocks defined by combinations of drift, raise, and trench sample/assay data, or by groups of drill-hole sample/assay data, but occurring with a lower degree of certainty than "positive", "proven", or "assured" ore blocks.
- 'Class A - Inferred' - Ore blocks comprising probable extensions of 'indicated' ore blocks.
- 'Class B - Inferred'
or
'Geologically-Inferred' - Ore blocks possibly present by virtue of meagre, but significant sample/assay data, their proximity to 'indicated' ore blocks, and the local geological favourability of the enclosing vein - interval for the occurrence of ore - grade mineralization.

Within a typical Slocan mining operation, the geologist is seldom able to provide a firm estimate of ore reserves much in advance of what is indicated at any one time as a result of an on-going program of exploration, development,

and mining. Normally, with ore occurring in relatively small but high grade bodies over only 20 - 30% of the gross area or strike of the vein, he will feel quite confident about the mine's long-term ore prospects if he has 8 - 12 months 'ore-in-sight'.

25% of mill feed is dilution

SCRANTON MINE

$\frac{25 \text{ dilu.} = 33.3\% \text{ dilution of ore}}{75 \text{ ore}}$
 $\frac{75 \text{ ore}}{100}$

33.3% Diluted 'Indicated' Ore
 † depending on dips

TABLE: CURRENT ORE RESERVES, SUNSET-S.W. SUNRISE SECTION
 TOTALS - INDICATED, CLASS-A INFERRED, &
 GEOLOGICALLY-INFERRED ORE WITHIN
 S.W. HALF OF SCRANTON VEIN

Block	(1)	(2)	Gross Oz	(3)	Gross Oz	(4)	"Tons- \bar{x} "	(5)	"Tons- \bar{x} "
	Tons	Oz/ton Au.	Au. = (1) x (2)	Oz/ton Ag.	Ag. = (1) x (3)	Pb, %	= (1) x (4)	Zn, %	= (1) x (5)
A-1	11,700	0.20	2,340	6.7	78,500	7.7	90,200	7.4	86,600
A-2	2,975	0.22	655	5.8	17,240	6.9	20,520	7.0	20,800
A-3	3,000	0.125	375	6.1	18,300	6.2	18,600	5.1	15,300
B-1	2,240	0.3	672	4.5	10,090	4.5	10,090	4.5	10,090
B-2	1,050	0.3	315	4.5	4,720	4.5	4,720	4.5	4,720
Q	1,520	0.122	185	3.2	4,860	2.6	2,960	2.9	18,100
E	3,770	0.16	604	8.0	30,200	6.4	24,150	4.8	30,400
C	16,000	0.03	480	6.9	110,600	5.5	88,000	1.9	30,400
D	12,700	0.074	940	2.6	33,050	7.3	92,800	4.1	52,100

Totals - 54,955 T @ 0.12 oz/ton Au. 6,566 307,560 6.4% Pb 352,040 4.4% Zn 242,520

Sub-Total - West Sunset Section: (Blocks A-1 - E. inclusive)
 In Place 26,255 T @ 0.196 oz/ton Au; 6.2 oz/ton Ag; 6.5% Pb 6.1% Zn
 Broken 1,500 T @ Same Grade
 Sub-Total *27,755 T @ 0.196 oz/ton Au; 6.2 oz/ton Ag; 6.5% Pb 6.1% Zn.

Class-A Inferred Ore

I	2,760	0.22	607	5.8	16,000	6.9	19,050	7.0	
J	2,640	0.3	792	4.5	11,850	4.5	11,850	4.5	
L	2,460	0.125	307	6.1	15,000	6.2	15,220	5.1	
F	16,000	0.03	480	6.9	110,500	5.5	88,000	1.9	
	23,860		2,186		153,350		134,120		

Totals - 23,860 T @ 0.091 oz/ton Au; 6.4 oz/ton Ag; 5.6% Pb 3.1% Zn

Sub-Total - West Sunset Section: (Blocks I.J.L.)
 * 7,860 T @ 0.217 oz/ton Au; 5.45 oz/ton Ag; 5.9% Pb; 5.6% Zn

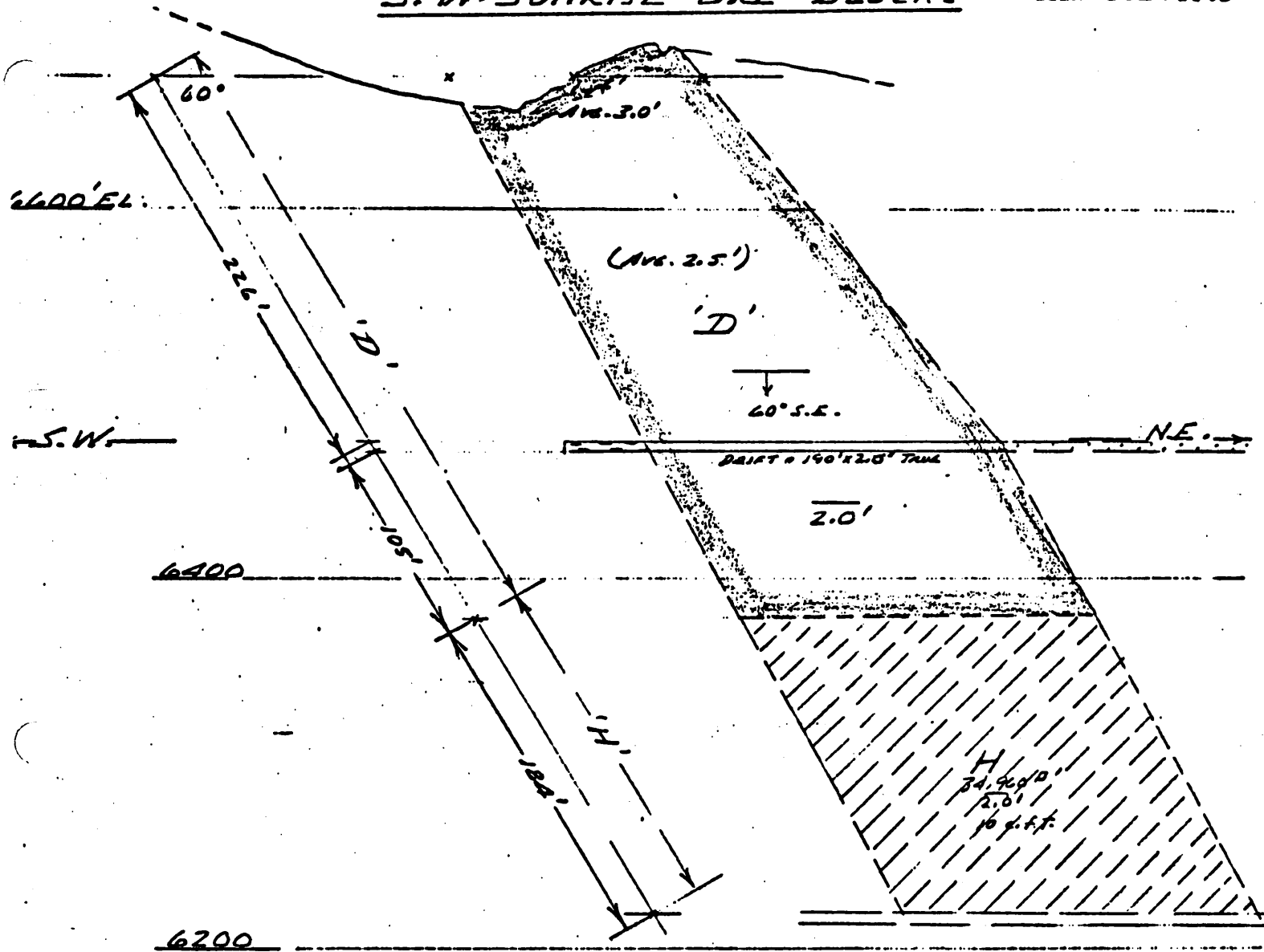
Total Indicated + Class-A Inferred Ore, West Sunset Section:
 * 35,615 T @ 0.201 oz/ton Au; 6.0 oz/ton Ag; 6.4% Pb; 6.0% Zn

Geologically-Inferred Ore: Sunset-Granite Section (Incl. 1971 - Class-B)

(L.V.P. area Encl. by Surface, 5600 Horizon, Sunset Portal & West Property Boundary)
 Assume 25% of Gross L.V.P. area in Ore @ 4' Min. Mining Width *
 Gross L.V.P. Ore Potential = $4200 \times 800' \times 4' \times 25\% + 10\% \text{ S.C.} = 370,000 \text{ Tons}$

Less: 'Indicated' + Broken + Class A-Inferred Ore Blocks = 35,615 "
 Total Geologically-Inferred Ore, Sunset-Granite Section = 334,385 Tons
 (Total Includes Total 'Class B Inferred' of 1971 estimate)

* S.C. = Slope Correction



INDICATED ORE:

BLOCK D:

(A) ABOVE LEVEL,
 AVG. STRIKE LENGTH = $\frac{190 + 134}{2} = 162'$
 AREA ON DIP = $162' \times 226'$ — — — — — 36,612 SQ. FT.
 (B) BELOW LEVEL,
 AREA ON DIP = $190' \times 105'$ — — — — — 19,950 SQ. FT.
 TOTAL AREA — — — — — 56,562 SQ. FT.
 TOTAL VOLUME @ 2.3' AVG. NORMAL WIDTH — 130,000 CU. FT.
TOTAL TONS. BLOCK D, @ 10.5 C.F.T.,
12,400 TONS. @ AU, 0.092 OZ/T; AG, 3.27 OZ/T; PB, 9.1%; ZN, 5.1%

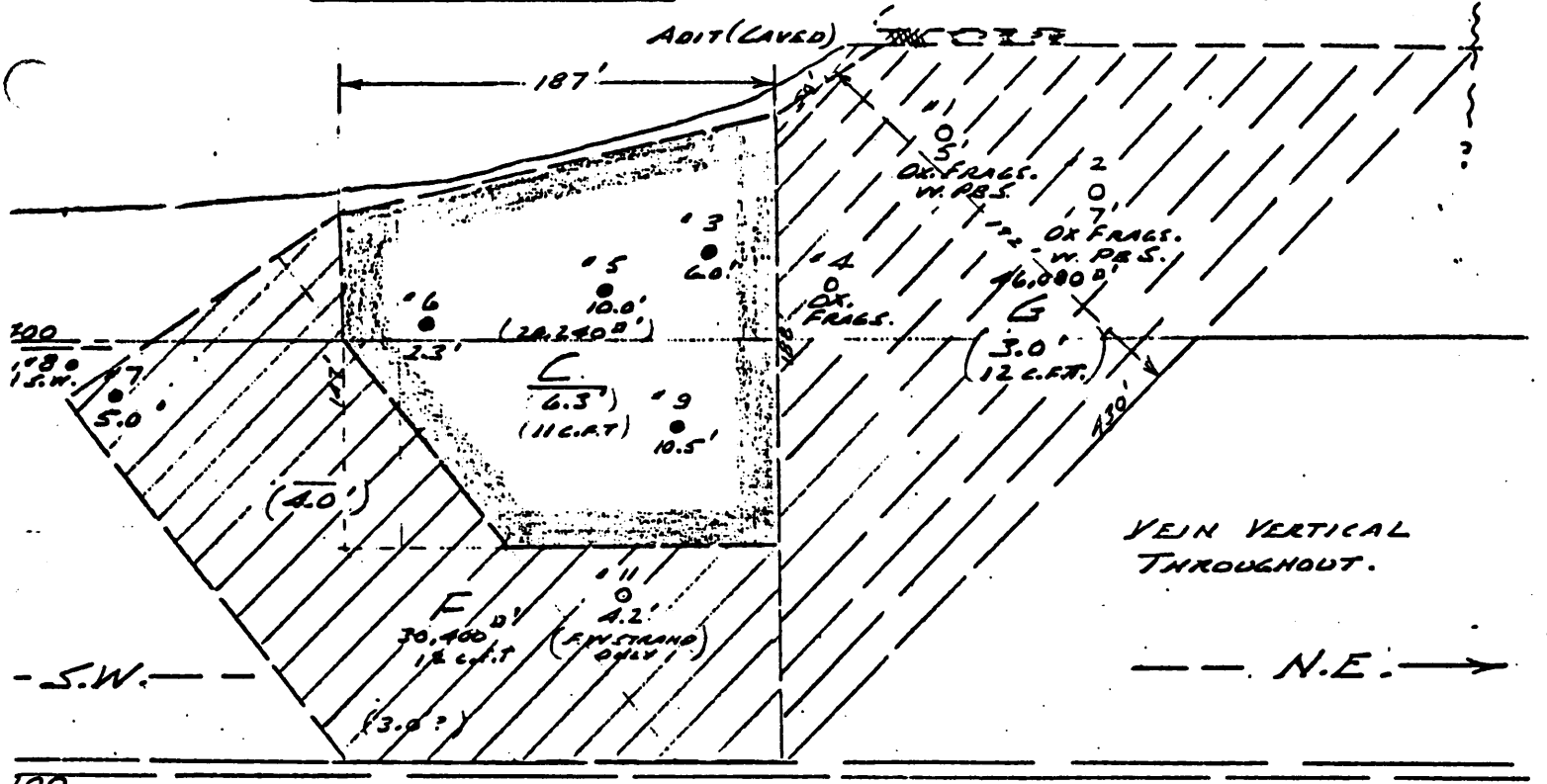
INFERRED ORE, CLASS B:

BLOCK H:

AREA ON DIP = $190' \times 184'$ — — — — — 34,960 SQ. FT.
 VOLUME = $34,960 \times 2.0' (H)$ — — — — — 70,000 CU. FT.
TOTAL TONS. BLOCK H, @ 10.5 C.F.T.:
7,000 TONS @ AU, 0.06 OZ/T; AG, 2.32 OZ/T; PB, 9.1%; ZN, 5.1%

DWH, JULY, 1971
REV. JULY, 1975

SUNRISE BASIN & GRANDVIEW ORE BLOCKS.



INDICATED ORE :

2 H. No	INDIC. WIDTH	ALL. OZ/T	AG. OZ/T	PB. %	ZN. %
3	6.0'	0.039	4.90	4.00	1.10
5	10.0'	0.035	8.10	5.50	0.90
6	2.3'	0.030	7.00	5.10	0.60
7	5.0'	0.030	6.50	4.50	0.85
9	10.5'	0.020	(7.00)	7.00	4.20
	<u>33.8</u>	<u>1.013</u>	<u>232.50</u>	<u>186.72</u>	<u>65.33</u>
4th Avg.	<u>6.76'</u>	<u>0.03</u>	<u>6.90</u>	<u>5.53</u>	<u>1.932</u>

ADJUST. AVERAGE TO INCL. WIDTH HOLES # 7 & # 11 & CUT # 9 TO 7.00 OZ/T AG :
 BLOCK 'C' = 16,000 T. (6.3') @ ALL. 0.03 OZ/T ; AG. 6.9 OZ/T ; PB. 5.5% ; ZN. 1.9%

INFERRED ORE - CLASS A :

BLOCK 'F' = $\frac{30,400' \times 4'}{12}$ = 10,000 TONS @ ALL. 0.03 OZ/T ; AG. 6.5 OZ/T ; PB. 4.5% ; ZN. 1.0%

INFERRED ORE - CLASS B : GRADE PER ARITH. AVG. OF HOLES - 3, 9, 11 :

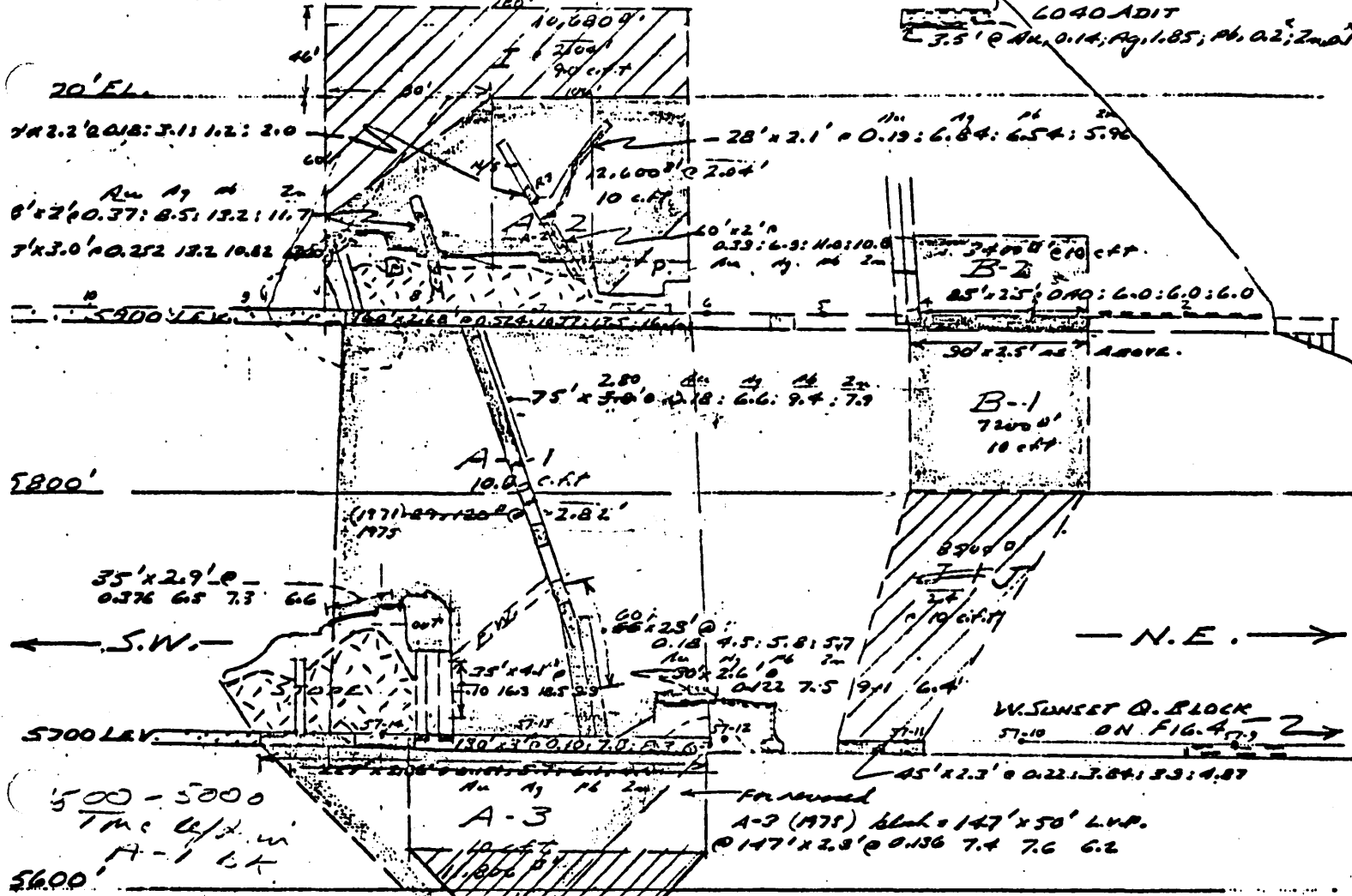
BLOCK 'G' = $\frac{240' \times 192' \times 3.0'}{12}$ = 11,500 TONS @ ALL. 0.03 OZ/T ; AG. 6.4 OZ/T ; PB. 4.6% ; ZN. 2.8%

FIG. 3
SILVER STAR - SCRANTON
 IN. RA. . . W.M.S.

WEST SUNSET ORE BLOCKS

DWN JULY 1975
REV. JULY 1975

2040 ADIT
L 3.5' @ Au, 0.14; Ag, 1.85; Pb, 0.2; Zn, 0.1



INDICATED ORE:

	Au	Ag	Pb	Zn
A-1 = 9120 TONS @ 0.277 = 2550.0	8.25 = 75,200	10.1 = 92,200	10.3 = 94,000	
A-2 = 2850 TONS @ 0.322 = 918.0	6.90 = 19,680	9.6 = 27,320	9.1 = 25,950	
A-3 = 3550 TONS @ 0.151 = 537.0	5.70 = 20,500	6.1 = 21,600	4.4 = 15,600	
B-1 = 1800 TONS @ 0.400 = 720.0	6.00 = 10,800	6.0 = 10,800	6.0 = 10,800	
B-2 = 850 TONS @ 0.400 = 350.0	6.00 = 5,100	6.0 = 5,100	6.0 = 5,100	
Q = 1600 TONS @ 0.175 = 280.0	4.57 = 7,300	3.7 = 5,910	4.15 = 6,640	
19,770 TONS @:	5,355.0	138,660	162,930	158,090
	0.27 oz/T Au;	7.0 oz/T Ag;	8.2% Pb.	8.0% Zn (+ Cd)

INFERRED ORE, CLASS A:

BLOCK 'I': 10,680' x 2.04' = 2420 TONS.

• 2420 TONS @ 0.322 oz/T Au; 6.90 oz/T Ag; 9.6% Pb; 9.1% Zn.

BLOCK 'J-1':

REF. SAMPLE-ASSAY AREAS: 5900 Lev. @ 90' x 2.5' = 225' @
5700 Lev. @ 45' x 2.3' = 104' @

AVG. GRADES:

225 x 0.40 = 90.0	x 6.0 = 1350	x 6.0 = 1350	x 6.0 = 1350
104 x 0.22 = 22.9	x 3.84 = 399	x 3.9 = 405	x 4.87 = 506
329	112.9	1749	1755
			1856

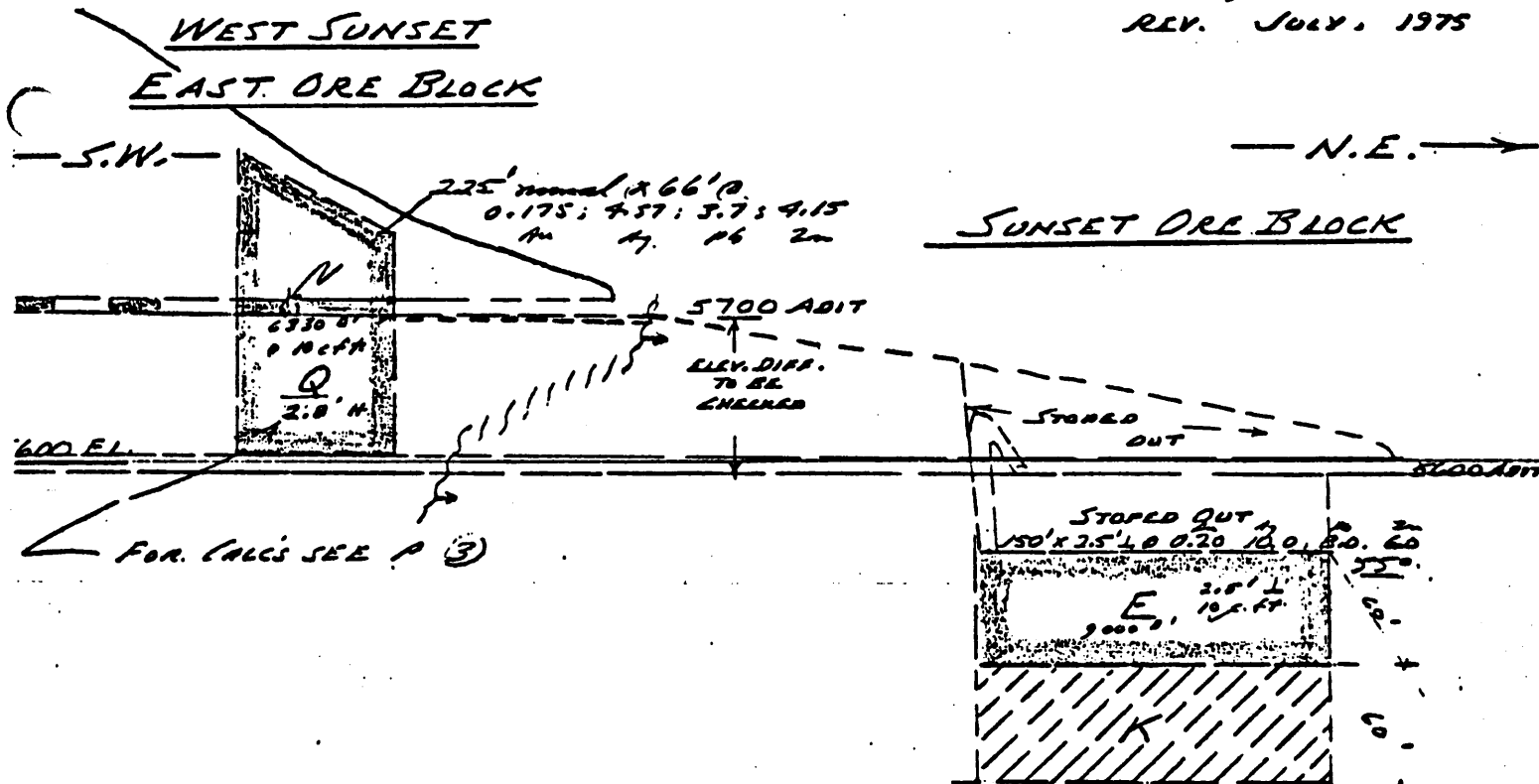
2040 TONS @ 0.344 oz/T Au; 5.5 oz/T Ag; 5.3% Pb.

5.6% Zn.

TOTAL BLOCKS 'I' + 'J-1':

4460 TONS @ 0.332 oz/T Au; 6.3 oz/T Ag; 7.6% Pb; 7.5% Zn

FIG. 2
SILVER STAR - SCRANTON
1" = 80'
W.M.S.



INDILATED ORE (CURRENTLY INACCESSIBLE):

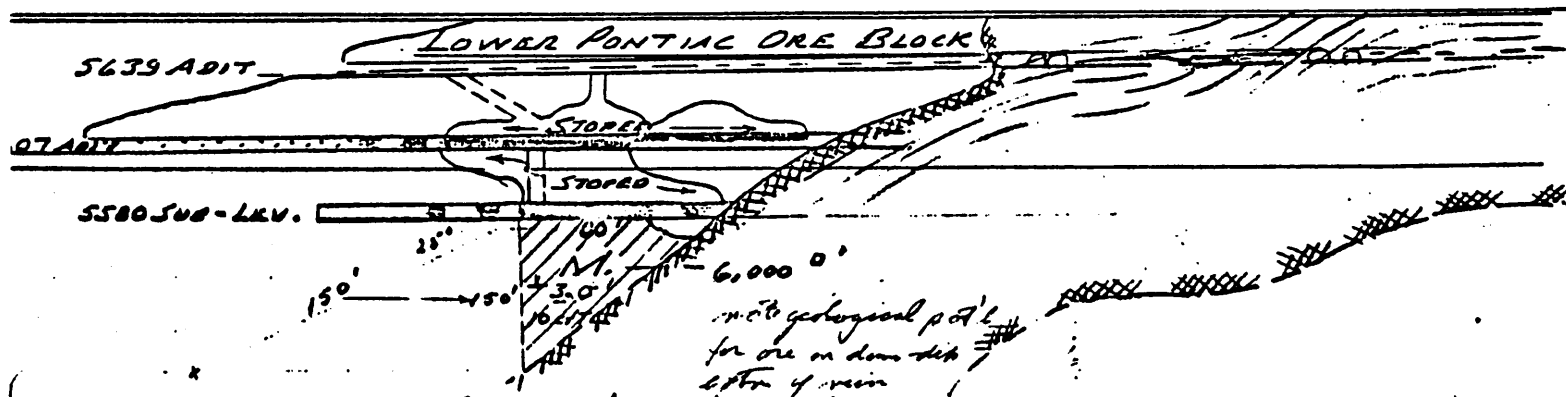
BLOCK 'E': $\frac{150' \times 60' \times 2.5'}{10.0} = 2550 \text{ TONS.}$

PER. FEB. 169 DATA & CALCS. =
2550 TONS @ Au. 0.20 oz/T; Ag. 10.0 oz/T; Pb. 8.0%; Zn. 6.0% (+ Cd)

INFERRED ORE, CLASS B:

BLOCK 'K':

PER. FEB. 169 DATA & CALCS. =
2550 TONS @ Au. 0.20 oz/T; Ag. 10.0 oz/T; Pb. 8.0%; Zn. 6.0% (+ Cd)



INFERRED ORE, CLASS A:

BLOCK 'M': $\frac{1}{10} (60 \times 150 \times 3) = 1800 \text{ TONS}$

PER. FEB. 169 DATA & CALCS. =
1800 TONS @ Au. 0.25 oz/T; Ag. 10.0 oz/T; Pb. 10.0%; Zn. 8.0%

METALLURGICAL TESTING - 1952

Denver Equipment Company obtained the following results from a selective-flotation test on a representative sample of ore derived from the Lower Pontiac orebody:

<u>Metal</u>	<u>Head Sample</u>		<u>Lead Concentrate</u>		<u>Zinc Concentrate</u>		
	<u>Grade</u>	<u>Recovery</u>	<u>Grade</u>	<u>Recovery</u>	<u>Grade</u>	<u>Recovery</u>	
Au. oz/ton	0.44	100.0	1.54	44.9	0.64	18.1	63%
Ag. oz/ton	11.86	100.0	71.66	85.9	4.70	5.4	91%
Pb, %	11.15	100.0	73.90	94.9	0.70	0.8	95%
Zn, %	10.05	100.0	1.98	3.0	59.60	88.6	89%

Metal recoveries via the combined concentrates were:

Au, 63%; Ag, 91.3%; (Pb, 95.7%; Zn, 91.6%)

only significant in that metal depletion to crude conc. of process to be very high

The above figure for gold-recovery is considered low, on the basis of the higher recoveries indicated by full-scale mill results relating to the amount of gold recovered from actual mill-runs of Scranton ore during the 1969 - 1970 period. The writer's estimates in the following pages are based on the following recovery figures, which appear to be more in line with actual milling experience:

Au, 88%; Ag, 92%; Pb, 95%; Zn, (+ Cd), 90%

ESTIMATED MILL PERFORMANCE

In regard to current estimates, and until sufficient additional ore is assured, it is anticipated that, to attain reasonable costs, through-put of the Ainsworth mill should be maintained at about 2500 short dry-tons ore per month. The nominal capacity of this mill is about 150 tons per 24-hr. day,

or 50 tons per 8-hr. shift. This would entail milling for 50 8-hr. shifts per month. On this basis it appears that the most applicable operating schedule would entail 25 2-shift days per month, or approximately 6 2-shift days per week.

On the basis of the current ore reserve estimates it appears that the mill could operate for about one year (30,000 tons) from that portion of the 'Indicated' ore reserves lying within the 'West Sunset' section of the property.

Current estimates show that there is a good possibility for the occurrence of 370,000 tons of "accessible" ore above the 5600-foot horizon within that half of the vein extending southwest of Pontiac Creek. Exploration and development of this could result in an 11-year supply of ore for the mill at the envisaged milling rate. There are undoubtedly additional ore reserves remaining to be discovered within the vein interval lying to the northeast of Pontiac Creek, but at present the specific data required to produce viable tonnage-grade estimates are inadequate for these purposes.

On the basis of the anticipated mill-recoveries, it is expected that the milling of 100 tons of ore of grade equal to that of the 'indicated' ore reserves will produce the following results:

<u>100 Tons of Ore Contain</u>	<u>Mill Recovery</u>	<u>Total Metal Recovered in Concentrates</u>	<u>Recovered in Pb Concentrates</u>	<u>Recovered in Zn Concentrates</u>
-196 oz. Au - 19.6 oz.	88%	17.25 oz.	14.3 oz.	2.9 oz.
6.2 oz. Ag - 620 oz.	92%	570 oz.	460 oz.	110 oz.
6.5% Pb - 6.5 tons	95%	6.2 tons	6.0 tons	0.2 tons
6.1% Zn - 6.1 tons	90%	5.5 tons	0.29 tons	5.21 tons
Cd - 0.12 tons	90%	0.11 tons	0.004 tons	0.106 tons

After metallurgical-balancing, the writer estimates the following concentrate grades:

Pb Concentrate - Au, 1.50 oz/ton; Ag, 48.1 oz/ton; Pb, 64%; Zn, 3.0%

Zn Concentrate - Au, 0.31 oz/ton; Ag, 11.5 oz/ton; Pb, 2%; Zn, 54%; Cd, 1.1%

Further, at a ratio = $\frac{6.0}{0.64}$, 100 tons ore yield 9.37 tons Pb Concentrate

at a ratio = $\frac{5.21}{0.54}$, " " " " $\frac{9.65}{19.02}$ tons Zn Concentrate

for a Ratio of Concentration = $\frac{100}{19.02} = 5.26$

EVALUATIONS-MILL CONCENTRATES & AVERAGE MINE ORE

(A) ESTIMATED NET SMELTER RETURNS - LEAD CONCENTRATES

Bases: Cominco Open Schedule; approx. metal prices-3rd week of July, 1975

<u>Payments</u>	<u>Can. Funds</u>
Au, 1.50 oz x 93% = 1.395 oz. x \$(170.00 - 3.00) - - - - -	\$232.96
Ag, 48.1 oz. x 93% = 44.73 oz. x \$(4.90 - .07) - - - - -	216.04
Pb, 64.0% x 92% = 58.9% = 1178# x (17.43¢ - (3.5 + .73)) - -	155.50
Zn, 3.0% = 60# x 60% = 36# x (34 - 12.5)¢ - - - - -	7.74
Gross Payments or Gross Revenue = - - - - -	<u>\$612.24</u>

Deductions

Less: Treatment Charge	\$27.85	
Fe Penalty assume (6 - 3)% x 70¢	2.10	
Rail car, assume \$100/50 tons	2.00	<u>\$ 31.95</u>
Net Smelter Value Per Ton, F.O.B. Tadanac		\$580.29
Less: Truck Transport/ton, mill to smelter		<u>10.00</u>
Net Smelter Value per ton, Ainsworth		\$570.29
Less: B.C. Royalties (by separate calc.)		<u>54.42</u>
Net Mill Value at Ainsworth		\$515.87

(B) ESTIMATED NET SMELTER RETURNS - ZINC CONCENTRATES

Bases: Cominco Open Schedule; approx. metal prices - 3rd week of July, 1975

<u>Payments</u>	<u>Can. Funds</u>
Au, 0.31 oz. x 93% (min. deduct. @ .03) = 0.28 oz. x \$(170-3) -	\$ 46.76
Ag, 11.5 oz. x 93% (min. deduct. @ 1.0 oz) = 10.5 oz. x \$(4.90-.07)	50.72
Pb, 2.0% or 40# x 85% (min. deduct. @ 20#) = 20# x (17.9-4.5)¢	2.68
Zn, 54% - 0.6% = 53.4% or 1068# x 85% = 907.8# x 33.6¢ (Fe @ 6% approx.)	305.02
Cd. 1.1%, or 22# - 3# = 19# x 60% x 2.50	<u>28.50</u>
Gross Payments or Gross Revenue	<u>\$433.68</u>

Deductions

Treatment, Basic Charge	\$ 14.50	
+ 33 1/3% x 305.02	101.67	
Add for Fe 6 x 70¢	<u>4.20</u>	\$120.37
Rail car, assume \$100/50T		<u>2.00</u>
		<u>\$122.37</u>
Net Smelter Value per ton, F.O.B., Tadanac		\$311.31
Less: Truck Transport per ton, mill to smelter		<u>10.00</u>
		\$301.31
Less: B.C. Mineral Royalties (by separate calculation)		<u>34.48</u>
Net Mill Value at Ainsworth		\$266.83

(C) NET SMELTER VALUES OF METALS IN CONCENTRATES, F.O.B., AINSWORTH

<u>Metal</u>	<u>Gross Value Metal in Concentrates Less Treat. & Transport</u>	<u>Less Royalties Due on Indiv. Metals</u>	<u>Gross Units of Metal in Concentrates</u>	<u>Net Smelter Value Per Unit Of Metal</u>
Gold	\$279.72 - 0.00 <u>\$279.72</u>	fld. \$279.72 - 37.42 <u>\$242.30</u>	1.81 oz.	\$133.87/oz.
Silver	\$266.76 - 0.00 <u>\$266.76</u>	" \$266.76 - 15.08 <u>\$251.68</u>	59.6 oz.	\$4.22/oz.
Lead	\$158.18 - 41.10 <u>\$117.08</u>	" \$117.08 - 4.40 <u>\$112.68</u>	1320#	8.54¢/lb.
Zinc	\$312.76 - 133.22 <u>\$179.54</u>	" \$179.54 - 31.41 <u>\$148.13</u>	1140#	12.99¢/lb.
Cadmium	\$ 28.50 - 0.00 <u>\$ 28.50</u>	" \$ 28.50 - 0.59 <u>\$ 27.91</u>	22#	\$1.27/lb.

(D) NET MINE OR MILLHEAD VALUE PER TON AVERAGE W. SUNSET ORE

Basis: 27,775 tons @ Au, 0.196 oz/ton; Ag, 6.2 oz/ton; Pb, 6.5%; Zn, 6.1%

Value computed is after pro-rate deductions for treatment, transport and B.C. Government Royalty on net smelter values of individual metals.

Mill-Head Ore Grade				Net Smelter Values
Au, 0.196 oz/ton	x	\$133.87	=	\$26.24/ton
Ag, 6.2 oz/ton	x	4.22	=	26.16/ton
Pb, 6.5 or 130#	x	.0854	=	11.10/ton
Zn, 6.1% or 122#	x	.1299	=	15.85/ton
Cd, 0.12% or 2.4#	x	1.27	=	3.05/ton
			Total	<u>\$82.40/ton</u>

Allowing for mill-losses:

<u>Net Smelter Value</u>		<u>Mill Recovery</u>		<u>Net Mine or Millhead Value</u>
Au, \$26.24	x	88%	- - - - -	\$23.09/ton
Ag, \$26.16	x	92%	- - - - -	24.07/ton
Pb, \$11.10	x	95%	- - - - -	10.55/ton
Zn, \$15.85	x	90%	- - - - -	14.26/ton
Cd, \$ 3.05	x	90%	- - - - -	2.75/ton
			Net Mine or Millhead Value	<u>\$74.72/ton</u>

Check - Net Millhead Value above:

100 tons of ore milled yields: 9.37 tons Pb Conc. @ 515.87 = \$4833.70
 9.65 tons Zn Conc. @ 213.18 = \$2574.91
 Derived from 100 tons ore - - - - - \$7408.61
 Value per ton of ore - - - - - \$ 74.09

Difference (\$74.72 vs. \$74.09) due to approximation in estimates of actual quantities of Pb and Zn concentrates produced from 100 tons of ore. Accept value of \$74.72 per ton as the value to use in estimates.

(F) NET MINE VALUE/TON BEFORE DEDUCTION OF B.C. ROYALTIES

(For use in calculation of Federal Income Tax)

	<u>Mill</u>		<u>Net @ Mine</u>
Au, 0.196 oz/ton x \$154.54	= \$30.29	x 88%	= \$26.65/ton
Ag, 6.2 oz/ton x 4.47	= 27.71	x 92%	= 25.49/ton
Pb, 6.5% or 130# x .0887	= 11.53	x 95%	= 10.95/ton
Zn, 6.1% or 122# x .1575	= 19.21	x 90%	= 17.29/ton
Cd, 0.12% or 2.4# x 1.295	= 3.11	x 90%	= 2.80/ton
Totals	<u>\$91.85/ton</u>		<u>\$83.18/ton</u>

Net Mill-Head or Mine Value per Unit of Metal

Au,	\$133.87 x 88%	=	\$117.81/oz
Ag,	4.23 x 92%	=	3.88/oz
Pb,	.0854 x 95%	=	0.0811/lb.
Zn,	.1299 x 90%	=	0.1169/lb.
Cd,	1.27 x 90%	=	1.143/lb.

PRODUCTION ESTIMATES(A) Preliminary Statement

The current estimates are based on tonnages and grades of 'Indicated' ore within the currently better explored and developed West Sunset section of the vein. This reserve comprises ore blocks A-1, A-2, A-3, B-1, B-2, Q and E plus broken ore in stopes:

27,755 tons @ Au, 0.196 oz/ton; Ag, 6.2 oz/ton; Pb, 6.5%; Zn, 6.1%

Also, revenues and costs are estimated on the basis of mine/mill

production/milling rate of 2500 tons per month (21 - 2-shift mine days/mo.). As the gross capacity of the Ainsworth mill, at an average 27 24-hour running days and three repair/maintenance days per month, is about 4000 tons, there is a ample spare capacity for additional mine ore, or custom-milling of 'outside' ore. Employment of these particular alternatives would result in either a reduced operating cost per ton of Scranton ore mined and milled or additional revenue for the operating company.

(B) ESTIMATED OPERATING COSTS - MINE & MILL

(1) Mine Labour

Item	Personnel	Per Day	Plus Avg. 15% Fringe Benefits
a) Stopping Ore	Miners, 7 @ \$75	\$525.00	
b) Stope Development	Miners, 2 @ \$75	\$150.00	
c) Gen. Underground & Trammig,	Labourers, 6 @ \$50	\$300.00	
d) Gen. Timbering & Chute Construction	Timbermen, 2 @ \$75	\$150.00	
e) Mechanical & Electrical	Journeymen, 3 @ \$60	\$180.00	
f) Surveying & Mapping	Geologist, 1 @ \$65	\$ 65.00	
g) Shift Supervision	Shifters, 2 @ \$65	\$130.00	
h) Gen. Supervision/Management,	Property Supt. 1 @ \$80	\$ 80.00	
i) Bulldozing, loading, road repairs	Equipment Operator 1 @ \$60	\$ 60.00	
	Sub-Total	<u>25</u>	<u>\$1,640.00</u>
			<u>\$1,886.00</u>

	Sub-Total (brought forward)	\$1,886.00
(2)	Mine Supplies, @ 35% (gross labour + supply costs)	<u>\$1,015.54</u>
	Sub-Total (1) + (2)	\$2,901.54
(3)	Sub-Total, Mine Labour & Supplies @ 120 t.p.d.	\$24.18/ton
(4)	Average Travel Allowance or Camp Cost, @ \$7.50/man-day	1.56/ton
(5)	Building & Road Maintenance & Clearing	0.50/ton
(6)	Office Accounting, Engineering, Supplies, Etc.	1.00/ton
(7)	Ore Loading and Hauling (good road)	4.00/ton
	Sub-Total Mining & Hauling	<u>31.24/ton</u>
(8)	Milling - Toll Charge	8.00/ton
(9)	Miscellaneous, General Overhead	0.54/ton
	GROSS OPERATING COST FOR PROPERTY	<u>\$39.78/ton</u>
	GROSS OPERATING PROFIT = (\$74.72 - 39.78)	\$34.94/ton

PRELIMINARY FEASIBILITY ESTIMATE

RE: DEVELOPMENT & EXTRACTIONS OF WEST SUNSET ORE BLOCKS

(a) Average Grade & Mill-head Value

Block A-1	: 11,700 tons	@ Au, 0.20 oz/t; Ag, 6.7 oz/t; Pb, 7.7%; Zn, 7.4%
" A-2	: 2,975 "	@ Au, 0.22 " ; Ag, 5.8 " ; Pb, 6.9%; Zn, 7.0%
" A-3	: 3,000 "	@ Au, 0.125 " ; Ag, 6.1 " ; Pb, 6.2%; Zn, 5.1%
" B-1	: 2,240 "	@ Au, 0.3 " ; Ag, 4.5 " ; Pb, 4.5%; Zn, 4.5%
" B-2	: 1,050 "	@ Au, 0.3 " ; Ag, 4.5 " ; Pb, 4.5%; Zn, 4.5%
" I	: 2,760 "	@ Au, 0.22 " ; Ag, 5.8 " ; Pb, 6.9%; Zn, 7.0%
" J	: 2,640 "	@ Au, 0.3 " ; Ag, 4.5 " ; Pb, 4.5%; Zn, 4.5%
Broken Ore:	1,500 "	@ Au, 0.196 " ; Ag, 6.2 " ; Pb, 6.5%; Zn, 6.1%
Total	27,865 "	@ Au, 0.206 " ; Ag, 5.62 " ; Pb, 6.28%; Zn, 6.06%

Net Mill-head or Mine Value of Ore:

Au, 0.206 oz	x \$117.81	= \$24.27/ton
Ag, 5.62 oz	x 3.88	= 21.81/ton
Pb, 6.28% = 125.6 lbs.	x .0811	= 10.19/ton
Zn, 6.06% = 121.2 lbs.	x .1169	= 14.17/ton
Cd, 0.10% = 2.0 lbs.	x 1.143	= 2.29/ton

Total, Net Mine Value = \$72.73 per dry ton

Value 27,865 tons (total extraction) @ \$72.73/ton	\$2,026,621
Gross Cost Mining, Trucking & Milling = 27,865 tons @ \$39.78/ton	<u>\$1,108,470</u>
Gross Operating Profit Indicated	\$ 918,151
(Check: 27,865 x (72.73 - 39.78) = \$918,151.75)	

Required Development for Extraction of West Sunset
Ore Blocks:

Block A-1

Current existing raise to an adequate service/ventilation
raise:

(a) Slash 70' for additional chute compartment and timber 70' @ \$80/ft.	\$ 5,600
(b) Slash for 2 additional compartments, timber and install pipes & ladders, 180' @ \$130/ft.	23,400
(c) Install additional raise chute	400
(d) Provision - 2 additional chutes @ 5700 lev.	800
(e) Provision - general stope rehab.	<u>1,000</u>
Sub-Total	\$ <u>31,200</u>

Blocks A-2 & I

(a) Extend 3 cpt. raise through 6040 lev. Net 170' @ \$150/ft.	\$ 25,500
(b) Connect to surface via 6' x 7' standard drift, with tail-room = 300' @ \$85/ft.	25,500
(c) Provision - gen. stope rehab.	<u>1,000</u>
Sub-Total	\$ <u>52,000</u>

Block A-3

(a) Sink 3-cpt. winze through A-3 sill, with sump, allow 80' @ \$250/ft.	\$ 20,000
(b) Drift out full length of ore @ sill, allow 160' @ \$80/ft.	12,800
(c) Allowance for stope preparation	<u>7,500</u>
Sub-Total	\$ <u>20,300</u>

Carried Forward \$918,151

Blocks B-1 & J

(a) Drive 2 cpt. raise through 5900 level, with head-room = 280' @ \$120/ft.	\$	33,600	
(b) Allow 2 auxil. bop-hole raises @ 100' each, 200 @ \$65/ft.			13,000
(c) Install 3 chutes @ 5700 level			<u>1,200</u>
Sub-Total	\$		<u>47,800</u>

Block B-2

(a) Preparation of stope sill @ 5900 level, 80' @ \$40/ft.	\$	3,200	
(b) Install, 3 chutes			<u>1,200</u>
Sub-Total	\$		<u>4,400</u>

Total Stope Preparation	\$	155,700	
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Allow for portal plant rehab. & install.			25,000
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Allow for equip. purchase & repairs			20,000
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Allow for contingencies @ 15%			<u>30,000</u>	<u>\$230,700</u>
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TOTAL NET PROFIT, BEFORE B.C. & FED. TAXES				<u>\$687,451</u>
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CONCLUSIONS

Revenue received from the efficient development and mining of the above-noted West Sunset ore blocks would be sufficient to sustain a program of comprehensive exploration and development of the property's large ore potential, and perpetuate mining operations for possibly ten to twelve years.

Respectfully Submitted



W.M. Sharp, P. Eng.



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 practised my profession for twenty-five years, which includes eleven years as a geological consultant.
4. I have personally examined, mapped, and sampled the principal surface and underground vein exposures on the Scranton Au-Ag-Pb-Zn property during several visits to the property - including the most recent, which was made during the period June 19 - 25, 1975 for Mr. Arthur J. Cassidy of Vancouver, British Columbia.
5. My formal report on the Scranton Au-Ag-Pb-Zn property is based on my field examination data, supplemented by general background information contained in various Provincial and Federal government reports.
6. I have no direct or indirect interest in properties which are held, or may be held by Mr. A.J. Cassidy or his associates or affiliated companies, nor do I own or intend to acquire any equity or securities in this connection.

W. M. Sharp

W.M. Sharp, P. Eng.

North Vancouver, British Columbia
August 14, 1975.

