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REPORT ON THE  
KENVILLE MINE  
NELSON MINING DIVISION  
B. C., CANADA

for

ALGOMA INDUSTRIES & RESOURCES LTD.  
VANCOUVER, BRITISH COLUMBIA  
CANADA

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1/

① Metallurgical results?

② Procr. Product. = 215,000 tons  
Grade = ?

③ Vein structures - NW  
and 45° to flat?  
from 6" - 8' (av. 3').  
Py., Calc., Pbs., FeO, WO<sub>3</sub>  
+ Au - coarse grained  
with g. 5 - schistite  
sp. (later mineral?)

④ Production costs:

Procr. Product. = 5.00  
Mining + Milling = 85.00  
Smelter + Refining = 9.00  
99.00

Net Profit = 254 - 99 = 155 / ton

⑤ 257 & 275 lead  
apex?

2/Samples

$$10 + 11 + 6 + 10 = 37 \text{ samples.}$$

Total Ore

Indicated

$$70,700 @ .469 = 33,158$$

Potential

$$116,200 @ .501 = 58,216$$

$$186,900 @ .489 = 91,375$$

⑥ why 2 different  
rail gauges?

## TABLE OF CONTENTS

	<u>Page</u>
1. Summary and Conclusion	1 - 2
2. Introduction	3
3. Location and Access	3 - 4
4. Property Description and History	4 - 5
5. Regional Geology	5 - 6
6. Local Geology and Mineralization	6 - 10
7. Ore Reserves and Economic Feasibility	10 - 18
8. Development	18 - 20
9. Recommendations	20 - 22
10. Estimate of Costs	23 - 25
11. Bibliography	26
12. Certificate of Qualifications	27
13. Appendix	28
(a) Maps and Illustrations	29 - 33
(b) Assay Sheets	34 - 40
(c) Milling Report, Kenville Gold Mine	41
(d) Kenville Project Timetable	42

# SCHEDULE OF ACCOMPANYING MAPS

<u>Plate</u>		<u>Page</u>
1	Index Map	29
2	Claim Map, Eagle Creek Area Nelson Mining Division	30
3	Geologic Map, Eagle Creek Area Nelson Mining Division	31
4	Correlation of Formations and Gold- Silver Deposits in the Slocan-Nelson- Eric Creek Area	32
5	Sampling Plan, 217 Flat Vein, Upper 217 Flat Vein, Hardscrabble Vein, and Yule Vein	In Pocket
6	Ore Reserve Plan, Kenville Mine, 1985	In Pocket
7	Proposed Exploration and Development Plan	In Pocket
8	Kenville Project Timetable	42
9	Location of Kenville Mine in Relation to Nearby Mills and Smelter	32
10	Section Through Kenville Mine	In Pocket

1. SUMMARY AND CONCLUSION

The Kenville Mine has several orebodies with an Indicated Ore reserves of 70,700 tons with a grade of 0.469 oz per ton Au, 0.390 oz per ton Ag, and 0.198 % W and a Potential Ore reserves of more than 116,200 tons. These ore reserves are from the orebodies in the 257 level only. There are additional ore reserves in the property but are not included in this report. The above ore reserves are from an area of the mine where the orebodies are still open to the south and down dip which are partly unexplored and unexploited by the past operators of the mine.

This part of the mine has a considerable potential for tungsten which was not exploited in the past.

A program of rehabilitation, diamond drilling, development, metallurgical testing, and mining is being recommended on the property. This program will develop and start mining of the Indicated Ore reserves and at the same time explore further the Potential Ore reserves. The metallurgical testing will determine the economic feasibility of recovering the tungsten in the ore and the best milling technique to recover the gold and silver content of the ore.

There are other ore reserve potential that exist at the 275 level, at the extension of the veins along strike to the south, and at the extension of the veins down dip. Further research, evaluation, and exploration of this ore potential on an on-going basis would be highly desirable but due to financing limitations no cost estimates for this part of the property are included in this report.

## 2. INTRODUCTION

At the request of Tony Semeniuk, President of Algoma Industries & Resources Ltd., a property investigation and mine evaluation were conducted on the Kenville Mine on January 22 - 29, 1985. The author was guided on the first day by Tony Semeniuk and assisted subsequently by Howard Miller and Robert Riley, miners employed by Algoma Industries & Resources Ltd.

The Kenville Mine is owned by Algoma Industries & Resources Ltd., a Company with offices at Suite 2802 - 1111 Beach Avenue, Vancouver, British Columbia.

Algoma Industries & Resources Ltd., require funds to finance the rehabilitation, exploration and resumption of mining at the Kenville Mine.

## 3. LOCATION AND ACCESS

The Kenville Mine is located on Eagle Creek on the northwest side of Toad Mountain in the Nelson Mining Division of British Columbia, at latitude  $49^{\circ} 28'$  and longitude  $117^{\circ} 23'$  (see Plate 1 and Plate 2). Access to the property is by way of the Kenville Mine road that connects with Highway No. 3A

(2 miles) away. At this point it is 10 kilometers west to Nelson, 32 kilometers to the Castlegar airport and 61 kilometers to the smelter in Trail, B. C. On Plate 9 the mine is shown in relation to various mills and the smelter in the area.

The mine lies at an elevation between 2500 feet to 3800 feet above sea level. The topography is moderate to steep and in part covered with merchantable timber.

#### 4. PROPERTY DESCRIPTION AND HISTORY

The Kenville Mine currently owned by Algoma Industries and Resources Ltd. consists of seven crown granted claims listed below:

<u>Crown Grants</u>	<u>Lot No.</u>	<u>Area</u>
✓ Poorman	101	8.36 Hectares
✓ Hardscrabble	102	8.36 Hectares
✓ Granite	2550	13.40 Hectares
✓ Red Rock Fr.	2551	9.78 Hectares
✓ Hardup	2557	7.49 Hectares
✓ Election	2559	16.56 Hectares
✓ Greenhorn Fr.	3691	5.21 Hectares

The Kenville Mine was originally called the Granite-Poorman Mine which mainly consisted of the above crown granted claims some of which were the first claims granted by the crown. The property has a long history dating from 1896 and was operated by various companies and leasees. In 1946 Kenville Gold Mines Ltd.,



a company controlled by Quebec Gold Mining Corporation and Noranda Mines Ltd. took over the property. This company conducted extensive exploration and development work and constructed a 125 tpd cyanide mill. The company ceased operating the mine but mining and milling continued until 1954 under various leasing agreements.

Small tonnages of ore were shipped to the Trail smelter in 1960 and 1961. The property was permanently shut down in 1962 after Noranda Mines Ltd. pulled out of the property and took out usable equipment and material from the mine and mill.

During the following years of dormancy the mine flooded due to the caving of the portals of the various drifts. In 1969, Algoma Industries & Resources Ltd. acquired the property and undertook to re-open the 257 level and dewatered the workings above this level.

The total recorded production in the Kenville Mine is about 215,000 tons between 1886-1969.

## 5. REGIONAL GEOLOGY

The area southwest of Nelson, British Columbia (see Plate 3) is underlain by rock formations belonging to the Rossland Group of Triassic to Cretaceous in age intruded by Cretaceous intrusives

belonging to the Nelson Plutonic Rocks.

The Rossland Group consists of andesite and basalt flows, breccias, agglomerates and greenstones of the Elise Formation overlain by siltstones and argillites of the Hall Formation which in turn is overlain by another sequence of andesite-basalt flows, breccias, agglomerates, and greenstones of the Beaver Mountain Formation.

The Nelson Intrusions have phases that range from a granite to granodiorite and diorite. In places these intrusives are altered to gneissic or schistose rocks which are referred to as psuedo-diorite (by Mulligan). Included within this formation are lamprophyr dikes and small intrusive ultra-basic rocks and referred to as pyroxine-hornblende-biotite rocks (by Mulligan).

The dominant regional structures in the area are northwest trending lineaments formed by faulting, jointing and formational contacts. Pre-mineral faults are often occupied by quartz veins while post-mineral faults and joints are manifested by the north-westerly directions of surface features such as creeks and ridges.

#### 6. LOCAL GEOLOGY AND MINERALIZATION

The Kenville Mine is underlain by intrusives of the Nelson Plutonic rocks that range from a granodiorite to diorite. R. Mulligan of the Geological Survey of Canada has called these intrusives psuedo-

diorite (see Plate 3). The intrusive at close proximity to the quartz veins is altered and gneissic.

Quartz veins cut the diorite along a northwest trend and dip around  $45^{\circ}$  to the northeast. These veins are occupying gravity fault planes that are prevalent in the area. Flat-lying quartz veins also occur in the area which occupy tension fractures produced by movements along the northwest trending inclined faults. Feeder veins radiate both from the inclined veins and the flat veins.

Post-mineral faults cut through the area such as the 219 fault and the 212 fault. Movement along these faults varies from a few feet to 50 feet such as in the 212 fault. Thin lamprophyre dikes occupy some of the post-mineral faults.

In view of the fact that some of the main quartz veins occupy fault planes that are regional in nature, these quartz veins have exceptional continuity along strike and down dip. The Hardscrabble, Yule, and Poorman veins have been drifted on by past operations for 1,000 feet and are still open to the south and down dip. The veins vary in thickness from six inches (15.24 cm) to eight feet (24.38 m) at an average of three feet (91.44 cm).

Metallic mineralization associated with the quartz consists of pyrite, chalcopyrite, galena, magnetite, scheelite and gold. The sulfides and the scheelite are coarse grained forming

veins, irregular masses and disseminations in the quartz. Scheelite forms veinlets and disseminations in the quartz usually separate from the sulfides.

According to a mineragraphic study done by the B.C. Research Council (1946), gold occurs as small veins and fracture fillings in pyrite and along contacts of the pyrite and quartz and in association with veinlets of the other sulfides in the pyrite. Free gold has been reported to occur in the quartz but has not been seen by the author.

Although no silver mineral has been identified in the property, silver occurs in the ore at a ratio of 1:1 or less with the gold.

Scheelite has been reported in the Kenville Mine particularly with the Poorman and the Hardscrabble veins. During this property evaluation, the occurrence of scheelite was investigated further. Scheelite occurs in the 217 Flat vein, the Upper 217 vein, the Yule vein and to a lesser degree in the Hardscrabble vein. The scheelite is generally coarse grained and occurs as distinct veins within the quartz usually independent of the sulfides. It appears that the scheelite content increases towards the south.

Sampling at the 217 Flat vein ranged from a high of 2.10 oz/ton Au and 1.52 oz/ton Ag of the character samples to a high of 0.89 oz/ton Au and 0.44 oz/ton Ag of the channel samples. The tungsten assays

ranged from less than 0.01% W to 1.18% W. The channel samples averaged 0.339 oz/ton Au, 0.392 oz/ton Ag, 0.15% W over an average width of 2.73 feet. Expanded to a mining width of four feet, the grade is 0.265 oz/ton Au, 0.308 oz/ton Ag and 0.117% W.

Sampling at the Upper 217 Flat vein which is actually the 217 Flat vein faulted up 50 feet ranged from a high of 4.20 oz/ton Au, 4.32 oz/ton Ag of the character samples to a high of 4.03 oz/ton Au, 2.13 oz/ton Ag of the channel samples. The tungsten assays ranged from 0.01% W to 0.85% W. The channel sample assays averaged 2.719 oz/ton Au, 1.9 oz/ton Ag and 0.17% W over an average width of 2.5 feet. Expanded over a mining width of 4 feet, the average grade is 1.699 oz/ton Au, 1.187 oz/ton Ag and 0.106% W.

The Hardscrabble vein does not contain any significant tungsten but sampling of the vein exposed along the 257 drift in an old stope ranged from 0.464 oz/ton Au and 0.47 oz/ton Ag to 4.09 oz/ton Au and 1.87 oz/ton Ag with an average of 2.73 oz/ton Au and 1.345 oz/ton Ag over a width of 2 feet. At an expanded width of 4 feet the average grade is 1.36 oz/ton Au and 0.672 oz/ton Ag.

At the southern part of the Yule vein, the main vein splits into several feeder veins. Composite samples of these feeder veins expanded into a mining width of 4 feet assayed an average of 0.325 oz/ton Au, 0.195 oz/ton Ag and 1.25% W. At the Yule vein, scheelite occurs as very coarse crystals that appear to be associated with the sulfides.

The assays of the samples taken during this investigation are shown in the Appendix of this report.

7. ORE RESERVES AND ECONOMIC FEASIBILITY

In 1946, according to W. B. Montgomery, former manager of Kenville Mines Gold Mines Limited, the "reasonably assured" ore from the Hardscrabble, Poorman, Yule, Midway, and No. 1 Flat Vein (217 Flat Vein) was 49,365 tons at an average width of 1.866 feet. Expanded to a mining width of 4 feet, this reserve was 105,819 tons. Four feet is used in this re-calculation since this appears to be the actual width of the stopes. According to the records the production from the Kenville Mine excluding the Granite Vein between 1946 and 1960 was 67,877 tons, presumably mined from 4-foot wide stopes. There should be a balance of 37,942 tons of "reasonably assured" ore. The problem with the above calculations is that no one really knows to what extent these ore bodies were mined. The only reliable way to determine the remaining ore is to make actual measurements of the stopes. This is a major undertaking due to the size of the mine and on the viewpoint of safety. It was therefore decided by this author to concentrate the investigation and evaluation on the readily accessible (and safe) part of the mine where the most tonnage with a reasonable grade still remains which require the least rehabilitation, exploration, and development work. During this investigation the 217 Flat Vein, the Upper 217 Flat Vein,

the Hårdscrabble Vein and the Yule Vein exposed on the 257 level were sampled, mapped, and evaluated since these ore bodies fitted the above criteria (see Plate 5).

According to W. B. Montgomery the calculation of ore reserves at the Kenville Mine was a major problem. Knowledge gained in regards to structure, ore occurrence, and interpretation of diamond drill and assay results was used in his calculations. In calculating the average grade, Montgomery used bulk sampling, followed by channel sampling with assays from diamond drill intersections being given minor consideration. In view of the remarkable continuity of the ore bodies along strike, the horizontal extension of the ore bodies are given much emphasis and intersections in development heading where the nature of the mineral occurrence can be studied have been given much more weight than diamond drill hole intersections. This is specially true in the area where this evaluation was carried since the drill holes in this area show little or no significant intersections (as per available records) and yet the ore is well exposed along the drift, stopes and headings. In the absence of the drill logs and the diamond drill cores, it is difficult to explain this apparent anomaly but it is probably in part due to the way in which the drill holes were spotted, for instance, it is very difficult to hit a flat lying vein with a flat hole. Montgomery's technique of ore reserve calculation is a superior technique and was adhered to by this author as much as possible.

In this particular study, channel samples taken by the author in the various drifts, headings and stopes that were safely accessible were used exclusively to calculate the grade of the various ore bodies. The taking of bulk samples was not possible at this time.

Two categories of ore reserves are used in this report, Indicated Ore and Potential or Inferred Ore which are defined as follows:

- Indicated Ore - is ore for which tonnage and grade are computed partly from specific measurements and partly from projection for a reasonable distance on geologic evidence. The grade is computed from the results of channel sampling in a more or less uniform pattern where possible in at least two dimensions. This tonnage may actually be classed "Measured" or "Proven" since it is exposed in three dimensions but the proportions of this tonnage to the Indicated Ore is small.
- Potential Ore - is ore for which estimates are based on an assumed continuity for which there is geologic evidence. Grades are estimated from channel samples taken from one dimension only. There is less confidence on the grade and it is a rough estimate at best.
- (Inferred Ore)

The 217 Flat Vein (No. 1 Flat Vein ?) is partly exposed in three dimension, along the 212 drift, at the 217 stope and the 217 cross cut (see Plate 6). This ore block is classed under the Indicated Ore category. A mining width of 4 feet is used in the calculation and the grade was adjusted accordingly. 5,000 tons which was mined was deducted. In view of the fact that the



vein is strongly persistent and does not show any sign of pinching out, the above ore block was projected 200 feet to the south and 200 feet to the east and classed as Potential Ore.

The Upper 217 Flat Vein (No. 2 Flat Vein ?) is the 217 Flat Vein that has been faulted up 52 feet by the 212 fault. A small stope was started on this ore body and about 125 tons taken out. It appears that two up holes were drilled from the 212 drift to explore this ore body. Unfortunately the drill records are no longer available. One of these holes went through the small stope and undoubtedly was used to locate the up-faulted extension on the 217 Flat Vein. The direction in which the vein was displaced can be readily determined by the slickensides on the fault plane. The flat veins intersect the inclined veins but the raises driven along the incline veins missed the Upper 217 Vein because the raises were driven on the hanging wall side of the fault. A mining width of 4 feet was used to calculate the tonnage of this ore block and the grade adjusted accordingly. In view of the fact that the vein is strongly persistent with no sign of pinching out, the ore block was projected 100 feet west to the limit of the property and 200 feet to the south and classed as Potential ore.

The Hardscrabble Vein was drifted along the 257 level and 212 drift for over 2000 feet up to the 219 fault. It appears

that 350 feet of this vein was left unmined. Since the author was unable to sample this vein except along the 212 drift, this ore block was arbitrarily classed in the Potential Ore category. A small block of ore was left unmined immediately south of the junction of the 257 level and the 212 drift in an old stope. Another small block of ore was left as a 30 feet by 84 feet sill, 114 feet north of the junction. Both small blocks were classed as Indicated Ore.

The Yule Vein was drifted on the 257 level for 800 feet. Three hundred feet of the ore body was left unmined. In this area, the Yule Vein splits into several feeder veins. The tonnage of the first 100 feet was classed as Indicated Ore and the tonnage of the remaining 200 feet was classed as Potential Ore.

A summary of ore reserves are shown below:

INDICATED ORE

<u>ORE BODY</u>	<u>TONS</u>	<u>Au</u> <u>(oz/ton)</u>	<u>Ag</u> <u>(oz/ton)</u>	<u>% W</u>
217 Flat Vein	53,300	0.232	0.268	0.103
Upper 217	10,000	1.699	1.187	0.106
Hardscrabble	1,400	1.360	0.672	-
Yule	<u>6,000</u>	0.325	0.195	1.258
Total	70,700	<u>0.469</u>	<u>0.390</u>	<u>0.198</u>

POTENTIAL ORE

<u>ORE BODY</u>	<u>TONS</u>	<u>Au</u> <u>(oz/ton)</u>	<u>Ag</u> <u>(oz/ton)</u>	<u>% W</u> <u>Est.</u>
217 South	33,300	0.203	0.162	0.13
217 East	23,300	0.136	0.277	0.07
Upper 217	26,600	1.500	1.100	0.10
Hardscrabble Vein	21,000	0.232	0.435	-
Yule Vein	<u>12,000</u>	0.300	0.200	1.00
Total	116,200	<u>0.501</u>	<u>0.453</u>	<u>0.177</u>

(Note: Grades should be considered as estimates only.)

There is supposed to be 19 veins in the property. It was not possible to make a complete investigation and evaluation of all of them since that would be a major undertaking involving considerable financing. It is felt however that the above partial investigation and evaluation of some of the readily accessible ore bodies is sufficient at this time to justify re-opening the mine for further exploration, development and mining.

One hundred eighty feet above the 257 level is the 275 level. A preliminary examination by the author of the workings on this level indicated that there is considerable ore left at the Poorman, Yule, and Midway Veins but no attempt was made to sample and evaluate them since it was decided to give first priority to the 257 level.

The following parameters are used to calculate the cash flow on the indicated ore reserves:

ORE RESERVES: 70,700 tons @ 0.469 oz/t Au, 0.390 oz/t Ag  
0.198% W

METAL PRICES:

Gold : <sup>445</sup> \$320 US per ounce  
Silver : \$ <sup>9</sup> 7 US per ounce  
Tungsten : \$60/STU (\$3.00 US per pound)

CONVERSION FACTOR:

\$1 US = \$1.33 Canadian

MILLING AND SMELTING RECOVERIES:

90% for gold and silver

RATIO OF CONCENTRATE:

1 : 50

The gross value per ton of ore is calculated below:

GOLD (Au)

0.469 x 0.90 x <sup>445</sup> \$320 x 1.33 = <sup>219.20</sup> \$179.65 (Canadian)

SILVER (Ag)

0.390 x 0.90 x <sup>7.00</sup> \$6.00 x 1.33 = <sup>4.21</sup> \$ 2.80

TUNGSTEN

0.0019 x .65 x 2,000 lbs x 3 x 1.33 = \$ 9.86

<sup>219.20</sup>  
<sup>2.80</sup>  
222.00

The cost to produce one ton of ore is calculated as follows:

Development and exploration	\$ 2.12 (Canadian)	2.12
Mining	40.00	60.00
Milling	10.00	10.00
Smelter	3.70	3.70
Trucking	10.00	15.82
	<u>\$ 65.82</u>	

<sup>188.04</sup>

The net profit per ton of ore is \$126.49 (Canadian) excluding taxes and royalties.

Profit Per Ton = \$50.00 net Profit 188.04 x 50 = \$9402.00

The potential profit on the indicated ore reserves is  
13,294,428.00  
therefore \$8,942,843.00 (Canadian).

At a mining rate of 100 tons per day, the life of the mine based on the indicated ore reserves is 2 years plus another 3 years on the potential ore. It should be pointed out that there are additional reserves at the 275 level that are not included in this evaluation, which if properly explored can add considerably to the projected life of the mine.

The Kenville ore has responded very well to several types of metallurgical treatment such as with stamp mills (amalgamation), flotation and cyanidation. The last mill that operated in the property was a cyanidation mill. A metallurgical balance sheet for a 4-week period in 1948 is shown on the Appendix of this report. During that period the mill operated at about 100 tons per day with a metal recovery of 95.53%. Using metal prices and costs presented in this section, the operation would have yielded \$122,598.47 Can. net profit in that 4-week period. This data is being presented to emphasize the crucial importance of good milling recovery. There are several flotation mills and one flotation mill with a cyanide circuit within a 60 mil radius from the Kenville Mine which may be suitable to treat the Kenville ore (see Plate 9). However, none of these mills have any gravity circuits to recover the tungsten in the ore. It is important to

conduct the proper metallurgical tests to see if it is economically feasible to recover this important component of the Kenville ore. Also, the area where further exploration and development are being proposed is expected to contain scheelite.

The scheelite and the pyrite which carries the gold in the Kenville ore are very coarse grained and theoretically should respond very well to a pre-concentration technique such as a combination jigging and screening at the mine site to reject some of the waste from the ore prior to milling. Since there is no operational mill at present in the mine site, this will reduce the cost of transporting the ore to a suitable mill. Due to the location of the mine, it is environmentally impractical to revive the mill at the property.

Provided there is adequate financing available for a project of this magnitude, it makes good engineering sense to conduct enough exploration and development prior to resuming mining and build up enough reserves to justify the construction of a mill owned by the joint venture in a suitable site.

#### 8. DEVELOPMENT

There are 19 veins in the area and all have undergone through some form of development in about six systems of levels. Being one of the oldest mines of the district, many of the workings were inaccessible even in 1936. The majority of the workings are between

elevation 2500 feet to 3000 feet above sea level and none of the workings go farther south than the 217 Flat Vein . An adit, 1100 feet long was driven from the old mill site near the Kootenay River at Taghum at approximately an elevation of 2000 feet but was not driven far enough to reach known sections of the veins. For the purpose of this report, this level will be called the Taghum Adit.

According to W. B. Montgomery, as of Dec. 5, 1946, a total of 5285 feet of drifting have been done. About 215,000 tons have been produced in the property.

In terms of future ore development, three main workings are important. These are the 257 level, the 275 level and the Taghum Adit.

The 257 level provides access to the majority of the known ore reserves in the 217 Flat Vein, the Upper 217 Flat Vein, the Hard-scrabble Vein, and the Yule Vein and the most logical place to start rehabilitation work.

The 275 level provides access to a substantial tonnage from the Poorman, Midway, Hardscrabble, and Yule veins. It will be necessary to re-open the portal of this level for ventilation and access if operation will start at the lower level (257 level).

To date, the 257 level is the only access to the underground workings of the mine. Access to the upper 275 level is by way of

a raise from this level.

There are several buildings in the property which include the mill building, a maintenance shop, the old assay building, a shed, and the manager's house which has been restored by the present owners of the property.

The drainage ditch from the 257 level has been repaired to conform with the requirements of the Nelson District Water Commission and Pollution Board.

9. RECOMMENDATIONS

In view of the substantial Indicated and Potential Ore reserves of the property, a program of rehabilitation, exploration, development, and mining is recommended (Please refer also to Plate 7).

(a) Rehabilitaion

To provide access to the current ore reserves, the 257 level should be rehabilitated. This involves the proper timbering of the portal at a couple of places along the drift, the re-laying of 4000 feet of tracks, air lines, and some ditch repairs.

To provide proper ventilation and escape routes, the portal of the 275 level should be re-opened and re-timbered.



(b) Diamond Drilling

A program of diamond drilling on the 217 Flat Vein, the Upper 217 Vein, Hardscrabble Vein and the Yule Vein should be undertaken using the present workings and the new drifts being recommended below for access.

(c) Drifting and Crosscutting

1. A crosscut should be driven below the Upper 217 Flat Vein in increments of 100 feet to provide access for diamond drilling and mining and extended to a total of 300 feet if warranted by the drilling results.
2. The 212 drift should be extended to the south to explore the southern extension of the 217 Flat Vein and to provide drill stations for drilling the Upper 217 Flat Vein and the Hardscrabble Vein.
3. The 217 drift should be extended to the west and south to explore the 217 Flat Vein further and to provide additional access to mine the 217 Flat Vein and to provide access to drill for the southern extension of the Yule Vein. This drifting should generate in the process about 1000 tons of ore.

(d) Metallurgical Testing

A series of flotation, cyanidation and gravity bench tests should be made on a composite bulk sample from the

mine to determine the best milling techniques for the ore .

(e) Mining

After the rehabilitation of the 257 level and the 275 level portal, mining can start from the 217 Flat Vein (west side at 212 drift) and from the Hardscrabble Vein. About 2500 tons can be mined during the above exploration and development without causing too much disruption. A total of 3500 tons therefore can be mined to generate an expected profit of \$100,000.

(f) Further Research and Evaluation

A program of on-going research, rehabilitation and evaluation is recommended on the remainder of the ore bodies but no cost estimates are included in this report.

ESTIMATE OF COSTS

(a) Rehabilitation

1. 257 Drift

Materials:

Tracks and accessories	\$ 42,935.00	
Ties, planks, spikes, timber	4,500.00	
4" Air pipes & accessories	3,160.00	
2" Air pipes & accessories	1,929.00	
Hangers & accessories	<u>2,053.00</u>	
	\$ 54,577.00	\$ 54,577.00

Labor @ \$6.00/foot	\$ 27,000.00	
Timbering @ \$40/foot	6,000.00	
Equipment rental	<u>4,000.00</u>	
	\$ 37,000.00	<u>37,000.00</u>
		\$ 91,577.00

2. 275 Portal

Materials:

Timber, hardware	\$ 500.00	
Labor @ \$40/hour	6,000.00	
Equipment rental	<u>1,000.00</u>	
	\$ 7,500.00	<u>\$ 7,500.00</u>

Sub-total \$ 99,077.00

Plus 10% contingency 9,907.00

Total \$ 108,984.00

Allow \$ 110,000.00

(b) Diamond Drilling

Drill Station, 16 @ \$400	\$ 6,400.00	
4000 @ \$17/foot, AQ, includes compressor, mud, core boxes	68,000.00	
Mob-demobilization	2,000.00	
Geologist (core logging, technical support, supervision)	6,000.00	
Assays, freight, materials	5,000.00	
Support costs	3,000.00	
	<hr/>	
Sub-total	\$ 90,400.00	\$ 90,400.00
Plus 10% contingency		<hr/> 9,040.00
Total		\$ 99,440.00
Allow		\$ 100,000.00

(c) Drifting and Crosscutting

Quoted cost per foot includes  
drilling, blasting, mucking  
tracks and airlines

(1) Upper 217 crosscut 150' @ \$200/foot	\$ 30,000.00	
(2) 212 Drift Extension 50' @ \$200/foot	10,000.00	
(3) 217 Drift West Extension 200' @ \$200/foot	40,000.00	
(4) 217 South Extension 200' @ \$200/foot	40,000.00	
Technical support	10,000.00	
Assays and support costs	2,500.00	
	<hr/>	
Sub-total	\$ 132,500.00	\$ 132,500.00
Plus 10% contingency		<hr/> 13,250.00
Total		\$ 145,750.00
Allow		\$ 146,000.00

(d) Metallurgical Testing

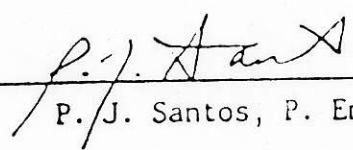
Bulk sampling	\$ 1,000.00	
Bench tests	20,000.00	
Assays	2,000.00	
Report	2,000.00	
Sub-total	\$ 27,500.00	\$ 25,000.00
Plus 10% contingency		<u>2,500.00</u>
Total		\$ 27,500.00
Allow		\$ 28,000.00

(e) Mining (217 Flat Vein, Hardscrabble Vein)

2500 tons @ \$40.00/ton	\$ 100,000.00	
Grade control, assays	<u>5,000.00</u>	
Sub-total	\$ 105,000.00	\$ 105,000.00
Plus 10% contingency		<u>10,500.00</u>
Total		\$ 115,500.00
Allow		\$ 116,000.00

Summary of Cost Estimates

(a) Rehabilitation	\$ 110,000.00
(b) Diamond Drilling	100,000.00
(c) Drifting and Crosscutting	146,000.00
(d) Metallurgical Testing	28,000.00
(e) Mining	<u>116,000.00</u>
Total Cost Estimate	<u>\$ 500,000.00</u>

  
P. J. Santos, P. Eng.

11. BIBLIOGRAPHY

- |   |  |
|---|--|
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| Snell, J. C.<br>1980  | - Development proposal for the<br>Granite-Poorman mine (Kenville<br>Mine), Nelson mining division,<br>British Columbia; unpublished<br>report, 30 pp.  |
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| Kenville Gold Mine Ltd.<br>1945-1949                            | - Various maps, plans, sections, sample<br>sheets, balance sheets.   |

12. CERTIFICATE OF QUALIFICATIONS

I, Perfecto J. Santos, of 626 - 9th Avenue, of the City of Castlegar, in the Province of British Columbia, do hereby certify:

That I am a Consulting Geological Engineer with the firm of Anginel Resources Ltd. whose offices are located at 626 - 9th Avenue, Castlegar, British Columbia, Canada.

That I am a registered Professional Engineer in the Province of British Columbia, Canada.

That I am a graduate of the College of Engineering, University of the Philippines with a Bachelor of Science degree in Mining Engineering (Geology Option),

That I have been practising my profession continuously for the past twenty-three years.

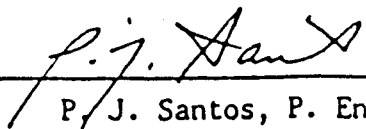
That I have prepared this report based on my personal work on the property as described in this report on the Kenville Mine owned by Algoma Industries & Resources Ltd.

That in addition, pertinent available literature and maps were studied prior to the preparation of this report,

That I have not received directly or indirectly, nor do I expect to receive any interest direct or indirect in the property and/or shares of Algoma Industries & Resources Ltd.

I hereby authorize Algoma Industries & Resources Ltd., to use this report or summary thereof for the purpose of filing prospectus and statement of material facts to fulfill the requirements of the Stock Exchanges and Securities Commissions.

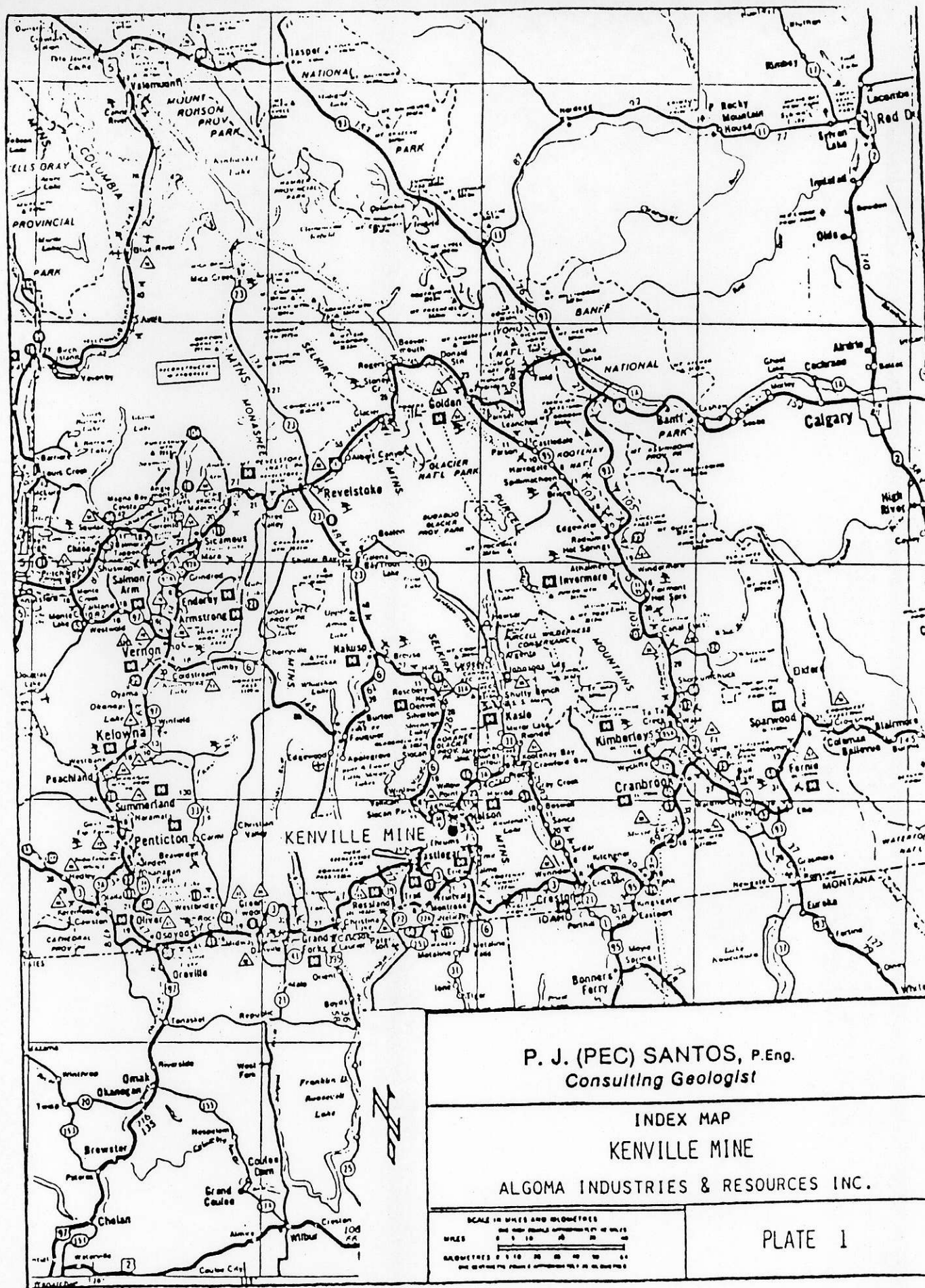
DATED at Castlegar, British Columbia, this 13th day of February, A.D. 1985.

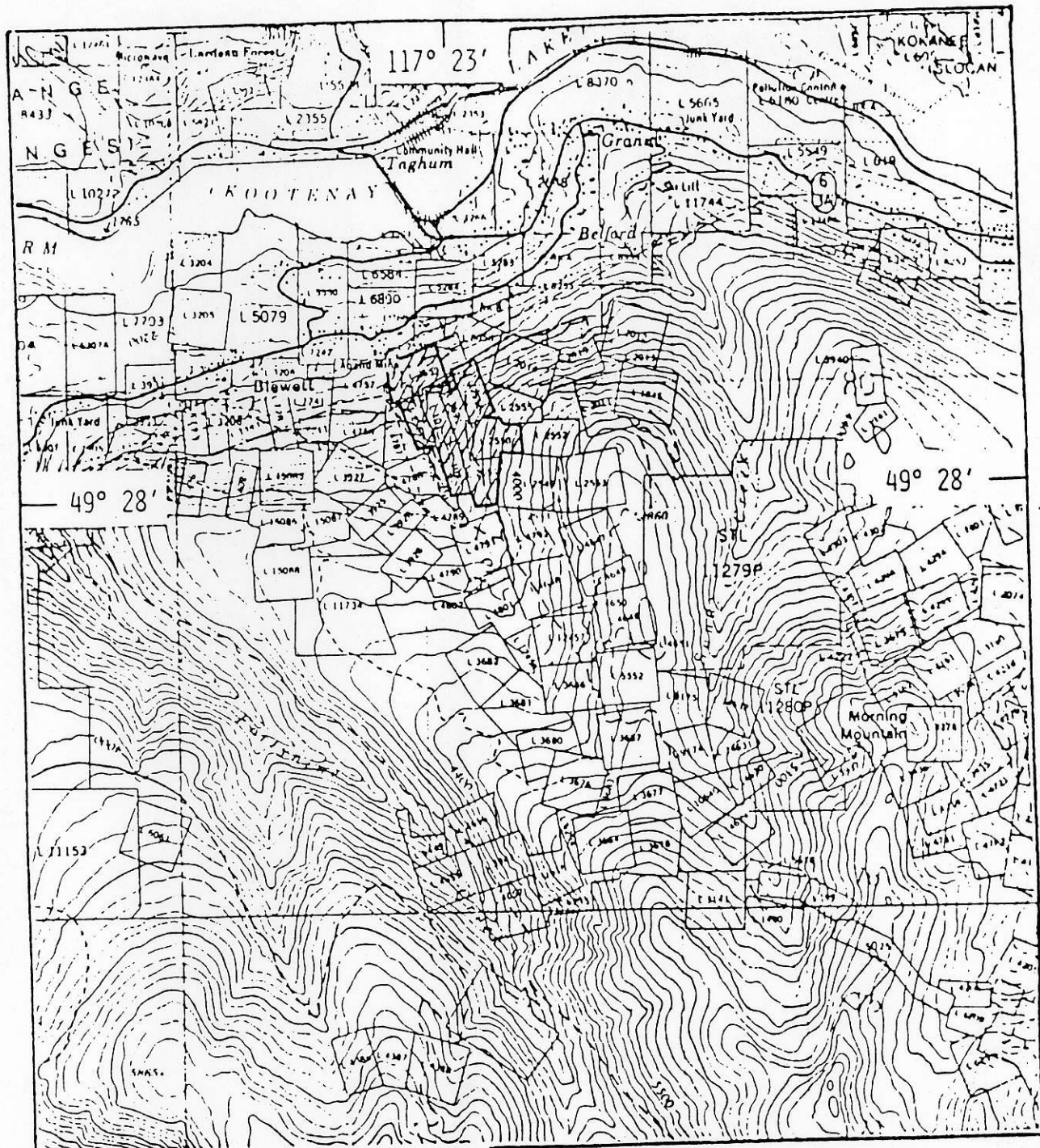
  
P. J. Santos, P. Eng.

13. Appendix

- (a) Maps and Illustrations
- (b) Assay Sheets
- (c) Milling Report, Kenville Gold Mines Ltd.
- (d) Kenville Project Timetable







**LEGEND and SYMBOLS**



KENVILLE MINE



**P. J. (PEC) SANTOS P. ENG.**  
Consulting Geologist

Project Title CLAIM MAP  
KENVILLE MINE  
NELSON MINING DIVISION  
BRITISH COLUMBIA, CANADA

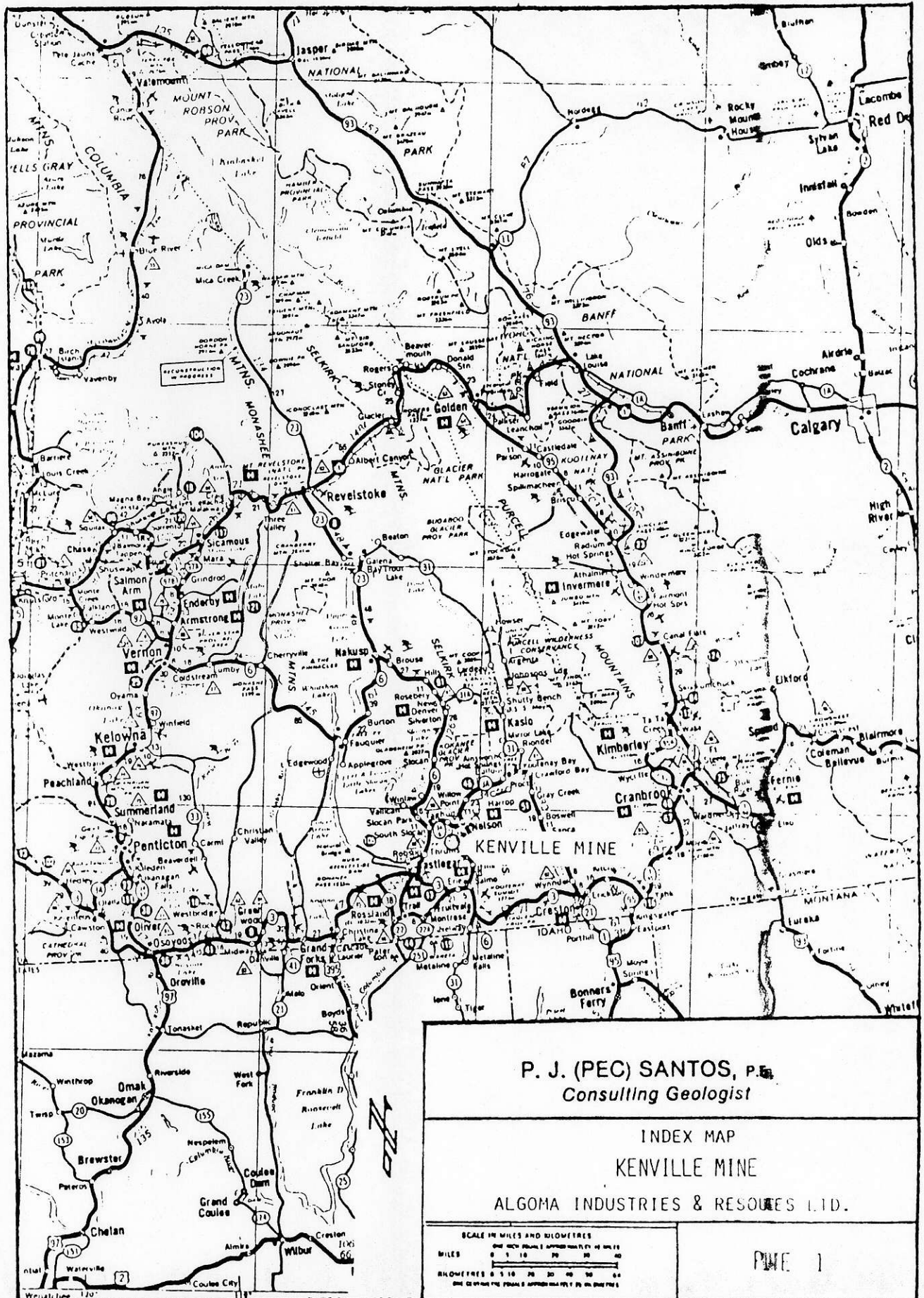
DATE · JAN. 1985

SCALE · 1:50 000

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PLATE NO. 5

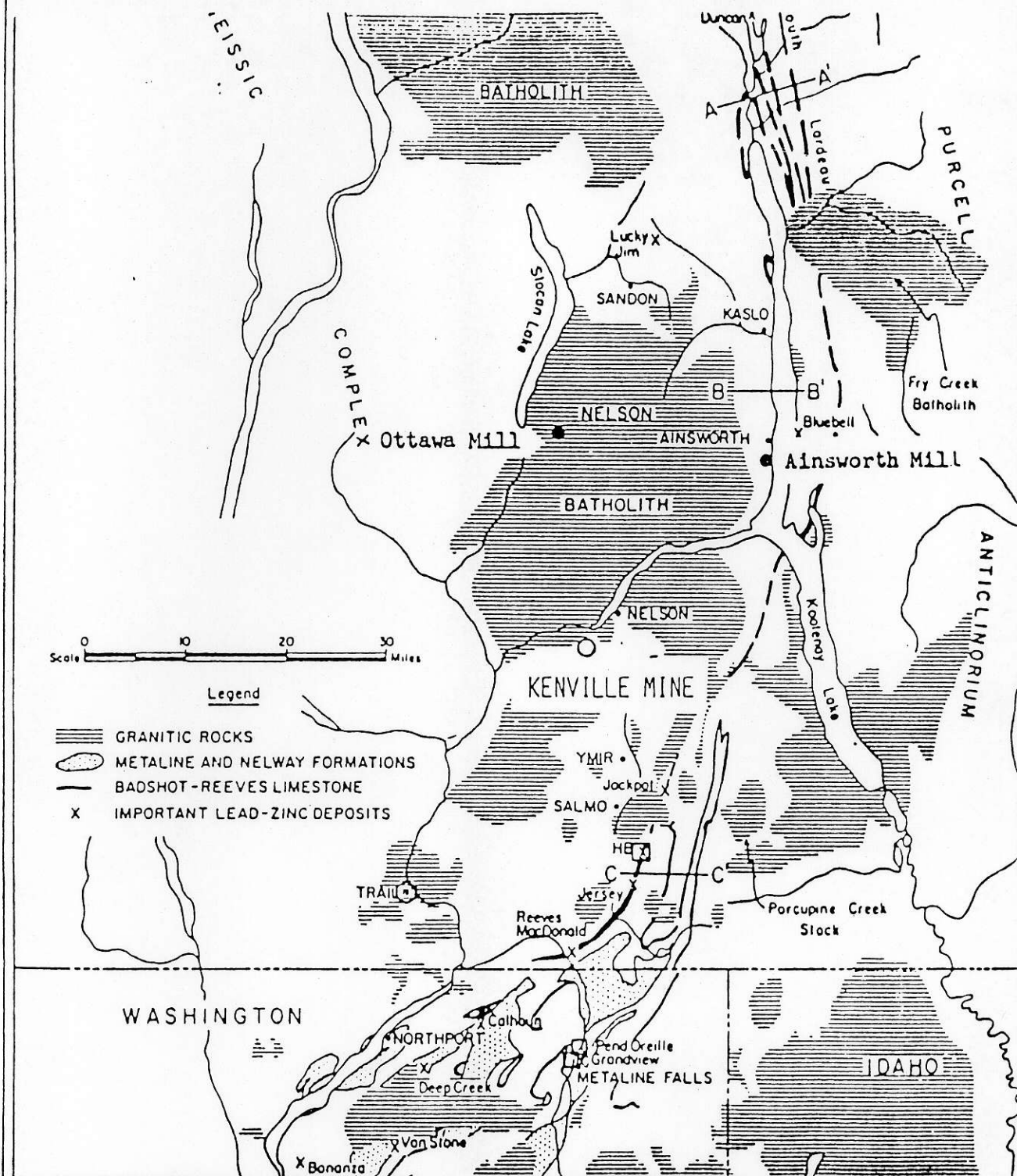




A. PERIOD, EPOCH	NELSON (WEST HALF) H.W. LITTLE			NELSON (EAST HALF) RICE, 1944	ROVER-ERIE CREEKS AREA	GOLD DEPOSITS (EXAMPLES)
	WEST PART	SOUTHEAST PART	NORTHEAST PART	WEST PART		
PLIOCENE		?				
MIOCENE		CONGLOMERATE				
OLIGOCENE		?				
EOCENE						
PALEOCENE						
UPPER CRETACEOUS	?					
	SOPHIE MOUNTAIN FORMATION					
LOWER CRETACEOUS	?					
UPPER JURASSIC		?			NELSON INTRUSIVES	CHAPLEAU CREEK AREA OTTAWA MINE ENTERPRISE GRANITE-POORMAN ARLINGTON ROZAM
MIDDLE JURASSIC		HALL FORMATION			ROSSLAND GROUP	PATTI (Noranda Res.) CONNOR (Waybo Res.) ROZAM (Patrick Res.) ROOT (Noranda Min.) HUNGARY MAN (Waybo) YMR MINE KEYSTONE (Delaware) SILVER DOLLAR ARLINGTON (Erie Gold) CLUBINE CUMSTOCK TALCUM AREA SECOND RELIEF MAY B JENNE PERRIER ROSSLAND GOLD-CAMP BEE (Silver Dart Min.) Bulldog (Silver Dart Min.)
LOWER JURASSIC	?	ROSSLAND FM	(ROSSLAND FORMATION TO NORTHWEST)		HALL-YMR FORMATION (UNIT B)	
	?	SINEMURIAN BEDS	?			
TRIASSIC			SLOCAN GROUP	?		
			?	SLOCAN GROUP		
		YMR GROUP		?		
			KASLO GROUP	?		
PERMIAN	?					
PENNSYLVANIAN				MILFORD GROUP		
	MOUNT ROBERTS FORMATION					
MISSISSIPPIAN	?					
DEVONIAN						

PLATE 4 Correlation of formations and gold-silver deposits in the Slocan-Nelson-Erie Creek areas.  
(Modified from H.W. Little's GSC Memoir 308)

To Accompany report by P.J. SANTOS P.Eng



- KENVILLE MINE
- HB Mill
- Grandview Mill
- Pend Oreille Mill
- Trail Smelter
- Ainsworth Mill    Ottawa Mill

P. J. (PEC) SANTOS, P.Eng.  
Consulting Geologist

LOCATION OF KENVILLE MINE  
IN RELATION TO NEARBY MILLS  
AND SMELTER

Jan. 1985

PLATE 9



# KAMLOOPS RESEARCH & ASSAY LABORATORY LTD.

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PHONE: (604) 372-2784 — TELEX: 048-8320

## CERTIFICATE OF ASSAY

B.C. LICENSED ASSAYERS  
GEOCHEMICAL ANALYSTS  
METALLURGISTS

TO Mr. P. J. Santos / Algoma Industries & Resources

626 - 9th Avenue

Castlegar, B.C. V1N 1H4

Certificate No K-6856

Date February 1, 1985

I hereby certify that the following are the results of assays made by us upon the herein described Kenville samples

Kral No	Marked	Au	Ag	W						
		ounces/ton	ounces/ton	percent						
1	10334	.034	.32	.08						
2	10335	.82	1.28	.05						
3	10336	.89*	.44	.03						
4	10338	.48	1.17	.05						
5	10339	.174	.09	.03						
6	10340	.380	.52	.12						
7	10341	.98	.55	.14						
8	10342	2.10*	1.52	.01						
9	10343	.61	.44	.17						
10	10344	1.06*	1.37	L.01						

L means "Less than"

Samples marked \* have been screened and found to contain coarse gold.

NOTE:  
Rejects retained three weeks  
Pulps retained three months  
unless otherwise arranged

Registered Assayer, Province of British Columbia



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GEOCHEMICAL ANALYSTS  
METALLURGISTS

TO Mr. P. J. Santos/Algoma Industries & Resources

Certificate No. K-6856 2

Date February 5, 1985

I hereby certify that the following are the results of assays made by us upon the herein described Kenville samples

Kral No	Marked	Weight	Au	Combined						
		%	ounces/ton	Au oz/t						
10336	-100	99.8848	.81	.89						
	+100	.1152	66.44							
10342	-100	99.976	1.79	2.10						
	+100	.024	1277.0							
10344	-100	99.9572	.93	1.06						
	+100	.0428	300.007							

NOTE  
Rejects retained three weeks  
Pulps retained three months  
unless otherwise arranged



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METALLURGISTS

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626 - 9th Avenue

Castlegar, B.C. V1N 1M4

Certificate No. K-6859

Date February 1, 1985

I hereby certify that the following are the results of assays made by us upon the herein described Kenville samples

Kral No	Marked	Au	Ag	W						
		ounces/ton	ounces/ton	percent						
1	10337	.070	.34	.03						
2	10345	.290	.26	L.01						
3	10346	.79	1.66	.01						
4	10347	.164	.26	L.01						
5	10348	.104	L.01	L.01						
6	10349	1.3	.55	L.01						
7	10350	.237*	.16	.50						
8	10351	3.89 *	3.41	.02						
9	10352	4.03 *	2.13	.01						
10	10353	4.20 *	4.32	.01						
11	10354	5.35 *	2.74	L.01						
L means "Less than"										
Samples marked * have been screened and found to contain coarse gold.										

NOTE  
Rejects retained three weeks  
Pulps retained three months  
unless otherwise arranged

*Registered Assayer*

Registered Assayer, Province of British Columbia





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B.C. LICENSED ASSAYERS  
GEOCHEMICAL ANALYSTS  
METALLURGISTS

TO Mr. P. J. Santos/Algoma Industries & Resources

Certificate No. K-6859 \* 2

Date February 5, 1985

I hereby certify that the following are the results of assays made by us upon the herein described Kenville samples

Kral No	Marked		Weight	Au	Combined					
			%	ounces/ton	Au oz/t					
10350	-100		99.9923	.22	.237					
	+100		.0077	223.09						
10351	-100		99.9837	2.46	3.89					
	+100		.0163	8803.43						
10352	-100		99.9913	3.38	4.03					
	+100		.0087	7427.79						
10353	-100		99.9485	2.34	4.20					
	+100		.0515	3611.62						
10354	-100		99.99	4.52	5.35					
	+100		.01	8259.71						

NOTE:  
Rejects retained three weeks  
Pulps retained three months  
unless otherwise arranged

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GEOCHEMICAL ANALYSTS  
METALLURGISTS

TO Mr. P. J. Santos/Algoma Industries & Resources

626 - 9th Avenue

Castlegar, B.C. V1N 1N4

Certificate No K-6858

Date February 1, 1985

I hereby certify that the following are the results of assays made by us upon the herein described Kenville samples

Kral No	Marked	Au	Ag	H					
		ounces/ton	ounces/ton	percent					
1	10355	-	-	.53					
2	10356	-	-	.50					
3	10357	-	-	.85					
4	10358	.464 *	.47	L.01					
5	10359	4.09 *	1.87	L.01					
6	10360	2.60 *	1.56	.01					
L means "Less than"									
Samples marked * have been screened and found to contain coarse gold.									

NOTE  
Rejects retained three weeks  
Pulps retained three months  
unless otherwise arranged

Registered Assayer, Province of British Columbia



# KAMLOOPS RESEARCH & ASSAY LABORATORY LTD.

912 - 1 LAVAL CRESCENT — KAMLOOPS, B.C.

V2C 5P5

PHONE: (604) 372-2784 — TELEX: 048-8320

## CERTIFICATE OF ASSAY

B.C. LICENSED ASSAYERS  
GEOCHEMICAL ANALYSTS  
METALLURGISTS

TO Mr. P. J. Santos/Algoma Industries & Resources

626 - 9th Avenue

Castlegar, B.C. V1N 1N4

Certificate No. K-6867

Date February 5, 1985

**I hereby certify** that the following are the results of assays made by us upon the herein described Kenville samples

Kral No	Marked	Au	Ag	H						
		ounces/ton	ounces/ton	percent						
1	10361	L.001	L.01	.15						
2	10362	.370*	.78	.32						
3	10363	-	-	1.18						
4	10364	-	-	.11						
5	10365	-	-	.59						
6	10366	-	-	.31						
7	10367	-	-	.15						
8	10368	-	-	.33						
9	10369	-	-	5.81						
10	10370	-	-	L.01						
L means "Less than"										
Sample marked * has been screened and found to contain coarse gold										
		Weight	Au	Combined						
		%	ounces/ton	Au ozs/t						
	10362 -100	99.9845	.256	.370						
	+100	.0155	740.637							

NOTE  
Rejects retained three weeks  
Pulps retained three months  
unless otherwise arranged

*R. H. Hoon*



# KAMLOOPS RESEARCH & ASSAY LABORATORY LTD.

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V2C 5P5

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## CERTIFICATE OF ASSAY

B.C. LICENSED ASSAYERS  
GEOCHEMICAL ANALYSTS  
METALLURGISTS

TO Mr. P. J. Santos/Algoma Industries & Resources

Certificate No. K-6858 2

Date February 5, 1985

I hereby certify that the following are the results of assays made by us upon the herein described Kenville samples

Kral No	Marked	Weight	Au	Combined						
		%	ounces/ton	Au oz/t						
10358	-100	99.9917	.38	.464						
	+100	.0083	1015.19							
10359	-100	99.9725	3.14	4.09						
	+100	.0275	3471.25							
10360	-100	99.9919	2.00	2.60						
	+100	.0081	7365.33							

NOTE:  
Rejects retained three weeks.  
Pulps retained three months  
unless otherwise arranged

Registered Assayer, Province of British Columbia



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## CERTIFICATE OF ASSAY

B.C. LICENSED ASSAYERS  
GEOCHEMICAL ANALYSTS  
METALLURGISTS

TO Mr. P. J. Santos/Algonia Industries & Resources

Certificate No. K-6858 2

Date February 5, 1985

I hereby certify that the following are the results of assays made by us upon the herein described Kenville samples

Kral No	Marked	Weight	Au	Combined						
		%	ounces/ton	Au oz/t						
10358	-100	99.9917	.38	.464						
	+100	.0083	1015.19							
10359	-100	99.9725	3.14	4.09						
	+100	.0275	3471.25							
10360	-100	99.9919	2.00	2.60						
	+100	.0081	7365.33							

NOTE  
Reprints retained three weeks  
Purpos retained three months  
unless otherwise arranged

Registered Assayer, Province of British Columbia



June 10, 1986

Alex Semeniuk  
 Tony Semeniuk  
 Algoma Mines  
 2802 1111 Beach Avenue  
 Vancouver, B.C. V6E 1T9

Dear Sirs:

We are pleased to submit the following results of the rock sample that you delivered. It was sampled as requested. Rock sample was crushed, milled, then tabled:

Weight of Rock = 36 lbs  
 Table Concentrate = 269 grams

The assay results are as follows:

Table Concentrate = 89.816 oz per ton Gold  
 Table Tails = 0.617 oz per ton Gold

The following calculations may be of interest to you:

36 lbs = 12,722 gm  
 Conc = 269 gm = 9.222 A.T. x 89.816 = 828.283 mgm Au  
 Tails = 12,453 gm = 426.961 A.T. x 0.617 = 263.435 mgm Au  
 Totals = 436.183 1091.718 mgm Au

$\frac{1091.718}{436.183} = 2.503$  oz/ton Gold in original material

It would be advisable to send in approximately 500 to 1000 lbs of the rock material for further testing.

Sincerely,

SANDO INDUSTRIES LTD.

W. S. Hunchuk  
 Certified Chemist

WSK/ay



100 WEBER



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LIMITED**

QUEBEC: 183 RUE GAMBLE O., C.P. 665 - ROUYN, J9X 2R8 - TEL: (819) 762-3010

ONTARIO: 20 VICTORIA STREET, SUITE 506 - TORONTO, M5C 2N8 - TEL: (416) 366-3100

Joe Webber

ROUYN, QUE. February 9, 1987

## CERTIFICATE OF ANALYSIS

Received from: Mr. Howard Miller  
Reçu de:

Date Received: February 1987  
Reçu le:

Samples of: File No. 832366  
Echantillons de:

Identification: \_\_\_\_\_

Gold	3.86	ozs./ton
Silver	2.41	ozs./ton
Arsenic	N.D.	ppm
Nickel	0.001	%
Cobalt	20	ppm
Bismuth	0.016	%
Copper	0.47	%
Zinc	0.013	%
Molybdenum	9	ppm
Lead	0.083	%

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PAR

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