# 800485

# REPORT ON THE

# KOOTENAY BELLE PROPERTY

SHEEP CREEK CAMP

# NELSON MINING DIVISION

SALMO B.C.

NTS Lat 49<sup>0</sup> 08'

82F/3E Long. 117<sup>0</sup> 08'

FOR

AMORE RESOURCES INC.

POCCE N.C. DAVIDSO BRITISH

EXPIRY DATE JULY 15, 1983

N.C. DAVIDSON, P. Eng. St. ANDREWS NOVA SCOTIA

SEPTEMBER, 1982.

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#### SUMMARY

The improved price for gold has stimulated interest in the Sheep Creek camp, B.C. where several gold mines were once active. The Kootenay Belle property covers two such old operations. The Kootenay Belle mine produced 292,893 tons at 0.375 oz. Au/ton and the Vancouver vein had recorded production of about 350 tons at 2.74 oz. Au/ton. In both situations the values are found in typical geological settings for the camp and in the case of the Vancouver there appears to be an immediate opportunity to test the vein below old workings. The favourable geological formations have not been fully explored near the workings and distant from them. Veins that were productive on adjacent claims should be explored on the property.

An agressive exploration program is recommended in three phases. Priority should be placed on the development of possible ore reserves for early mining of direct shipping ore to secure a return on investment and guide the longer term exploration effort. The veins mined in the Kootenay Belle offer good targets below, in and adjacent to old workings.

#### INTRODUCTION

Former gold producers in the Sheep Creek camp, the Kootenay Belle Mine and the Vancouver adits, were brought under one ownership in 1979. The Kootenay Belle Mine was closed in 1943 after more or less continuous operation beginning in 1932. The Vancouver adits were worked most seriously during 1932 - 1934 although they may have been prepared for full production in 1938 by Sheep Creek Mines. Elevated gold prices have renewed interest in areas of favourable geology in proximity to old workings which may possess immediate potential. The history of the camp provides extensive information on the geological settings of the deposits and guides to ore are well known. These provide opportunities for a re-evaluation of the veins that may have been abandoned prematurely on account of war time conditions, or prevailing unfavourable economics. In order to follow a logical sequence for exploration and development, the present operators intend to pursue the goal of developing immediately accessible direct shipping ore first.

# LOCATION AND ACCESS

The property is located in the Sheep Creek camp, Nelson Mining Division, southeastern British Columbia;  $49^{\circ}$  08<sup>•</sup> North Latitude;  $117^{\circ}$  08<sup>•</sup> West Longitude. From Salmo access is south via paved road on Old Highway 3 about four miles to the Sheep Creek Road (gravel) thence about six miles east. Tractor trailer loads can be landed within 1,000<sup>•</sup> of 6 level portal. Kootenay Belle portals at <u>6</u>, <u>3</u> and <u>2</u> (nearly) as well as the Hide Away adit can be reached easily with 4 wheel drive. A rough trail (footpath) leads from the portal at <u>2</u> level to the lower Vancouver adit.

Slopes on the mountainous terrain average about 40° ranging from heavy timber cover to outcrop on higher elevations. Sheep and Wolf (Waldie) creeks are potentially reliable sources of fresh water. Although climate is moderate, heavy winter snowfalls can be expected.

Salmo, the nearest commercial centre has about 2,000 population. With a tradition of mining activity, experienced mining labour and contractors are readily available. Main highway distances are twenty-five miles to Nelson, twenty-four miles to the Cominco smelter at Trail, and about twenty miles to a regional airport at Castlegar. In addition to the Great Northern Railway, the town has the normal complement of services; banking, accommodation, communications, etc.



PROPERTY

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c 03.07.1

The property is made up of ten reverted Crown Granted claims as follows:-

Argyle	L.	10155	Expires	Nov.	1991
Wolf '	L.	3856			11
Yosemite	L.	3654		71	**
Sultana	L.	9186		"	
Hide Away 🗸	L.	5625		"	**
Vancouver 🧹	L.	10006	7	11	"
Rio Tinto	L.	4640		"	"
Yosemite Fraction $\checkmark$	L.	102 <i>5</i> 4		"	**
Batt Fraction	L.	(9187		11	••
Helena 🗸	L.	9344		11	

It is understood that the property is controlled by Crow Equities Ltd., and it can be acquired by Amore Resources Inc. Title was not investigated further.





ARCTEX ENGINEERING SERVICES

Sept. 1982

#### HISTORY

The beginning of activity in the camp saw the Yellowstone and Queen veins staked in 1896, with the adjacent Kootenay Belle ground to the east worked in 1904. Between 1904 and 1911 about 5,000 tons of ore were taken from Kootenay Belle veins. Thereafter, particularly between 1932 and 1943, the A, B and Black veins were worked to produce a total of about 292,893 tons at 0.375 oz. Au/ton of which about 75% came from the A vein. This vein was stoped over 1,600', the greatest vertical range of any in the camp. The cyanide mill was moved off the property in 1943 (to Retallack) and operations virtually ended with only small tonnages shipped by leaseholders thereafter.

The Vancouver vein was worked via two adits and an underhand stope in 1909, 1911 - 1913 and 1932 - 1934. Production was recorded at 350 (383) tons ore yielding 960 (964) oz. of gold for an average grade of 2.74 oz.Au/ton (2.51). Both sets of data Mathews Table VI.

The Hide Away adit was apparently driven sometime before 1929 for a distance of 60'. It was extended in 1938 and 1939 to a total length of over 1,200' passing almost directly below the Vancouver vein workings. In 1940 raising (134') and diamond drilling (191') was reported.

During 1980 extensive geochemical sampling surveys were undertaken. The 1981 field season saw the following completed: additional geochem, access roads cleared/repaired, Kootenay

Belle portals at 6 and 3 restored to afford underground access; Vancouver adits mapped and sampled where possible; a road constructed to the Hide Away (Midnight) and portal restored.

# GENERAL GEOLOGY

Ore deposits in the Sheep Creek camp are found in quartz veins that cut two tightly folded anticlines which are overturned to the west. These structures and the intervening syncline are made up of a series of Precambrian (?) to Lower Cambrian age sedimentary rocks, predominantly quartzites and argillites. Tables I and II from Mathews work provides a correlation of the nomenclature used by different authors and a table of formations for lithology and thickness. The fold axes trend about  $015^{\circ}$  and dip about  $55^{\circ}$ - $75^{\circ}$  to the east with the eastern anticline plunging about  $10^{\circ}$ - $30^{\circ}$  to the south.

Granites were encountered in the lower workings of the Queen mine and quartz porphyry dykes and sills are present within the sediments. Both pre and post-vein basic dykes are known. Metamorphism of sediments is low. Four well defined fault sets have been identified. The group of northeasterly to easterly trending faults with a right hand strike slip movement are the most important as they provided the opening for ore deposition. Specifically those segments of the fissures with an easterly trend and largest displacement are generally more favourable for ore deposition.

Walker (1934)	McGuire (1942)	Mathews (1950)	Park and Cannon (1943)
Pend d'Oreille series : Lower part.	Pend d'Oreille series :	Laib Group (1,000 ft.+).2	
Reno formation.	Reno series: Reno argillite.	Reno formation (50 to 900 ft.). <sup>2</sup> Upper Reno. Lower Reno.	Maitlen phyllite.
Quartzite Range formation. <sup>1</sup> (Quartzite 2,600 ft.)	Reno quartzite. Reno argillaceous quartzite.	Quartzite Range formation (2,000 ft. <u>+</u> ). <sup>2</sup> Navada member: Upper Navada. Lower Navada.	
(Argillaceous member 200 ft.) <sup>1</sup>	Nugget series: Nugget quartzite. Nugget argillite.	Nugget member (540 to 900 ft.): Upper Nugget. Middle Nugget. Lower Nugget.	Gypsy quartzite.
(Massive white quartzite 1,600 ft.) <sup>1</sup>	Motherlode series: Motherlode quartzite. "Basal" argillites.	Motherlode member (1,000 to 1,100 ft.): Upper Motherlode. Middle Motherlode. Lower Motherlode.	
Three Sisters formation.		Three Sisters formation (500 ft. + ).2	

## Table I.—Correlation of Sedimentary Rocks

Thickness in the type locality, 3 miles east of the Sheep Creek camp.
 Thickness or range of thickness in or adjacent to the Sheep Creek mines.

Age		Formation		Lithology	Thickne	ess in Feet
				Argillite.	2001	
				Grey limestone.	1501	
Veren Cambrier		Leib Crows		Argillaceous in some localities, else- where dominantly calcareous.	300-5001	1,000+1
Lower Cambrian		Lato Group		Limestone and argillite.	150-3001	
				Argillaceous beds, biotitic and amphi- bolitic schists.	100-3001	
				Limestone.	0-601	
	Reno	Uppe	r Reno	Impure dark bluish or greenish quartzite with some grit beds.	1252	50,0001
	Pormation	Lower Reno		Argillite, argillaceous quartzite.	450 <u>+</u> 2	
		Navada	Upper Navada	Massive white quartzite.	20-160	
	Quartzite Range	zite Member	Lower Navada	Dark, thin-bedded quartzites and ar- gillaceous quartzites.	100-140	120-300
Precambrian (?)	Formation		Upper Nugget	Massive white quartzite.	135-375	
		Nugget Member	Middle Nugget	White, grey and dark quartzites, dark argillaceous quartzites, and argil- lite.	175-300	540-900
			Lower Nugget	Argillite and dark argillaceous quartzite.	150-225	
			Upper Motherlode	Massive white quartzite.	370-450	
		Motherlode Member	Middle Motherlode	Argillite, grey grit and green schist.	50	1,000-1,100
			Lower Motherlode	Massive white quartzite.	500-700	
	Th	ee Sisters For	mation	Grey grit, white quartizte and grit and green schists.		500+1

<sup>1</sup> Thickness or range in thickness for the northwestern part of the camp, near the Reno mine.
 <sup>2</sup> Average thickness from measurements near Reno mine.

After Mathews 1953

Almost all production has been from those veins where one or both walls consist of quartzite of either Nugget or Navada members of the Quartzite Range formation (using Mathew's terminology). Gold deposits consist essentially of quartz veins with minor sulphides. The latter in decreasing order of abundance are pyrite, galena and sphalerite. About 1/3 of the gold occurs within the quartz, generally along boundaries between quartz grains. The remaining 2/3 occurs with sulphides principally along quartz-pyrite contacts. Better gold values tend to occur in areas of higher galena and sphalerite concentration.

Oxidation of sulphides is evident to depths of several hundred feet in the Kootenay Belle A and B veins apparently with no effect on gold values. Whereas veins tend to pinch upward there is a perserverance in width with depth; laterally variations in vein width correspond to changes in strike and fault movement. High grade ore generally diminishes at depth with an attendant reduction in that proportion of the vein that could be mined profitably. Other physical or chemical controls have not been identified.

#### PROPERTY GEOLOGY

A map of the footwall geology in the A vein (Fig. 5) indicates all ore was hosted by Nugget and Navada quartzites. This vein on the western limb of the eastern anticline was stoped over 1,600' vertically. It was characterized on upper levels as narrow and high grade with oxidation evident as deep as 200' from surface

(4,200') to wider lower grade less continuous veins at 10 level (2,600'). Precise information as to stope widths and assays is lacking; however, Mathews indicates the foregoing in a general sense (Figs. 10 and 11, Bulletin 31). A steep rake to the east is evident in the ore shoot following the dip of the favourable quartzite members. The dip of the vein is to the south at about  $70^{\circ}$  and strike averages about  $N60^{\circ}E$ . The A vein accounted for about 75% of mine production.

The B vein branches off the A vein and maintains a strike of about N55°E and dips about 60° to the south. It was mined between 3 level and surface. Ore shoots in this vein accounted for about 10% of total mine production again in the quartzites. It was apparently explored by drift on the 7 level although no information is available on this effort (Figs. 3 and 4).

The Black vein located about 500' south of the A vein, strikes about N72°E and dips about 75° to the south. It was mined off 3, 6 and 7 levels for a vertical range of 800' to produce about 15% of total tonnage. It reportedly was narrow (1') but high grade and pinched out toward surface. The host rock was the same Nugget quartzite as A and B veins. Shortly before closure, it provided the bulk of mine production but it was not mined below 7 level as it dipped into the Midnight Fraction claim then owned by Sheep Creek Mines. A deep cross cut from the Queen Mine was apparently driven in 1941 - 1942 to test the Midnight and Black veins at depth, results are not known.

Recorded production from the Vancouver vein (about 350 tons grading 2.7 oz./ton) was apparently won from an underhand stope

in the favourable guartzite host rock. The stope void shown on Fig. 7 albeit indefinite suggests a much larger tonnage removed, so that if records are correct, hand cobbing may have reduced tonnage shipped to improve grade. A third adit was reported in 1934, 250' below the lower adit and after drivage of 275' in low grade vein material it had not reached the favourable formation. A search in the vicinity has not located this adit. The limited mapping and sampling in 1981, Figs. 9 and 10 tend to support geology and grade tenor shown on Figs. 6 and 7, 1938. The upper and lower adits positions indicate a 65° dip on the Vancouver vein; much steeper dips; however, were measured in the lower adit. If as air photo interpretation (L.B.G. Arctex Eng.) suggests, the Hide Away and Vancouver adits are on the same structure then the swing to the North in the Hide Away placed the drive in the footwall of the Vancouver vein. However, the Hide Away adit may have merely followed a change in strike of the structure at this depth. Clearly the resolution of such a question has important implications for the correct orientation of any up holes from the Hide Away to test the Vancouver vein.

It was reported from a cursory examination in 1981 (C.W. Donald-Hill, Arctex Eng.) that the Hide Away adit is in good condition with; a solid floor, a chute (raise?) and two drillholes evident at its east end. The fissure appears tight throughout and does not show vein material. This agrees with McGuire 1942, and B.C.D.M. report 1940 when it was referred to as the Midnight adit.

The Yellowstone and Queen veins were productive on the adjacent Sheep Creek Mines operation but they have not shown ore

grade values where they cross the Kootenay Belle ground to the north of the A vein. The Yellowstone and Queen veins were both intersected by the McCune tunnels and possibly located on surface on Kootenay Belle ground (Fig. 3). Neither has been adequately explored in the favourable quartzite host.

## ECONOMIC POTENTIAL

With improved prices for gold it is apparent that there are several good exploration opportunities on the property. Priority should be placed on exploring and developing the most accessible possible ore in the Vancouver vein to secure the earliest return on investment. If the tons, grade and mining conditions warrant, it may be possible to mine by an open stope perhaps, with sub level development off the Hide Away adit. Since this ore is highly siliceous and lacks contaminants conventional underground methods and truck transport to the smelter at Trail (Cominco) may be profitable. The Hide Away adit is well positioned and apparently in good enough condition for underground diamond drilling up holes to test the Vancouver vein and possibly use for subsequent mining. It also lends itself to the exploration of the Black and B veins at depth. This is dependent on thorough analysis of the geology, survey data and mine records to ensure that holes started from the Hide Away adit are properly oriented to intersect the Vancouver, Black and B veins.

Alternatively, short diamond drill holes could be put down from points below the lower Vancouver adit employing helicopter support and drill water from the flooded stope. These holes

coupled with stope sampling might provide the fastest means of testing the vein.

Additional new ore possibilities in the Yellowstone and Queen veins should be explored in the favourable formations. Geochemical anomalies previously identified may aid in this effort and should be followed up.

In the light of changed mining economics, the old Kootenay Belle workings should be re-examined. In the A vein pillars were left between 3 and 6 levels and development below 6 level was apparently limited on the basis of cut off grades. It may be possible to mine as ore that material left previously as uneconomic.

### CONCLUSION AND RECOMMENDATIONS

Since extensions of the Vancouver, B and Black veins may lie on the Midnight Fraction, rights to this claim should be acquired immediately. To attempt to develop a quantity of direct shipping ore in proximity to the underhand stope in the Vancouver vein, stope access for mapping/sampling and both underground and surface diamond drilling should be undertaken. The Hide Away adit, apparently driven to mine the Vancouver may be ideal for drilling up holes to probe the Vancouver below the existing stope. If this exercise proves successful then plans should be conceived for mining coincident with ongoing exploration. The latter entails drilling from the Hide Away to test the B and Black veins at depth and to the east. The Yellowstone and Queen veins should

be explored. A re-examination of the underground potential in the Kootenay Belle is warranted. The pursuit of these goals is recommended in a three phase program.

COST ESTIMATES

PHASE I

# Test Vancouver Vein

- Additional ground acquisition should proceed
  forthwith, particularly the Midnight Fraction
  and contained fractions (Matt, Victoria and
  Marie).
  \$ 10,000
- b) Research: B.C.D.M. files to finalize information on property and collate and compile data recently found at Retallack 5,000
- c) Underground and surface mapping and sampling/ surveying, preparation of u/g or surface for drilling 40,000
- d) 4,000 feet (1,219m) of diamond drilling 120,000
- e) Summary engineering report for Phase I 10,000

TOTAL PHASE I \$185,000

NOTE: a), b) and c) should proceed apace to formulate a decision as to orientation of drillholes from underground and/or surface.

e) a report is vital to evaluate findings and set out plans.

PHASE II

Contingent upon a successful first phase and the recommendations of an engineering report.

Mining in Vancouver Vein Preproduction Expenditure

- a) Rehabilitation of Hide Away adit
  (underground track, air/water lines etc.) \$ 50,000
- b) Portal and yard development for load out/ truck access. 10,000
- c) Development raising 500' at \$500.00/ft 250,000
  (allows for sub level development if necessary).
- d) Stope preparation 10,000
- e) Summary engineering report for Phase II 10,000

TOTAL PHASE II \$330,000

NOTE: mining costs for open stopes by contract should be provided for at 40 - 50.00/ton. (allowance for ore grade control, supervision etc). An engineering report should follow this phase to guide the future exploration in other veins.

PHASE III

Contingent upon report recommendations from Phase II

# Exploration

(Vancouver, B, Black, Yellowstone and Queen veins, as well as old workings in the Kootenay Belle Mine).

Drilling	from	Hide	Away	adit	5,000'	(1524m)	\$15	;0 <b>,</b> 000
	from	surfa	ace		5,000'	(1524m)	15	;0 <b>,</b> 000

æ	Renabilitation of Kootenay Belle for mapping/	
	sampling.	125,000
*	Mapping/sampling 6 - 3 levels	50,000
*	Dewatering and test deep ore (below 6 level)	500,000
	TOTAL PHASE III	\$975,000

NOTE: \* estimates uncertain.

spectfully submitted, "Precesso" N.C. DA BRITISH Norman C. Davidson, P. Eng. EXPIRY DATE JULY 15, 1983

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# ENGINEER'S CERTIFICATE

## NORMAN C. DAVIDSON

- I, Norman C. Davidson, am a Registered Professional Engineer in the Provinces of British Columbia, Nova Scotia and Ontario. My address is P.O. Box 39, St. Andrews Antigonish County, Nova Scotia, BOH 1XO.
- 2. I am a graduate of Michigan Technological University, Houghton, Michigan, U.S.A. with a B. Sc. in Mining Engineering. I am a graduate of Haileybury School of Mines as a Certified Mining Technician. I am registered as a Mine Manager under the Coal Mines Regulation Act of Nova Scotia. I am a member of C.I.M., A.I.M.E., and the Mining Society of Nova Scotia.
- 3. I have been engaged in mining exploration, development and mine production for 20 years.
- 4. This report is based on my experience on the property at various times during May, June and July of 1981, when I was employed as a consultant. References were used as noted as well as various company maps and data.
- 5. I have no interest either directly or indirectly in the Kootenay Belle property or Amore Resources Inc. nor do I expect to receive any.
- 6. I consent to the use of this report in a prospectus or in a statement of material facts related to the raising of funds.

St. Andrews Antigonish County Nova Scotia BRITISH

EXPIRY DATE JULY 15, 1983