

ARIS SUMMARY SHEET

District Geologist, Nelson

Off Confidential: 90.02.20

ASSESSMENT REPORT 18676

MINING DIVISION: Slocan

PROPERTY: Bluebird

LOCATION: LAT 49 59 00 LONG 117 11 00
UTM 11 5536574 486856
NTS 082F14E

CLAIM(S): Bluebird, Stranger

OPERATOR(S): Fireball Res.

AUTHOR(S): Snell, J.

REPORT YEAR: 1988, 23 Pages

COMMODITIES

SEARCHED FOR: Silver, Lead, Zinc

KEYWORDS: Triassic, Slates, Argillites, Quartz, Siderite, Galena, Sphalerite
Silver, Cretaceous, Nelson Pluton

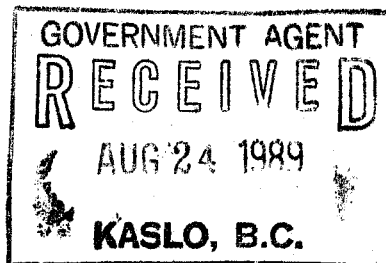
WORK

DONE: Geological

GEOL 100.0 ha

Map(s) - 2; Scale(s) - 1:1200, 1:480

MINFILE: 082FNW034



LOG NO: 0831	RD. 1
ACTION: Date received report back from amendments	
FILE NO:	

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FIREBALL RESOURCES LTD.
Vancouver, Canada

BLUEBIRD PROJECT
Slocan Mining Division, B. C.
Latitude 50°N - Longitude 117°15' W

Assessment Report
1988

James C. Snell, P. Eng.
Geological Engineer

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APPENDIX

FIG 1. GEOLOGICAL PLAN

FIG. 2. REFERENCE MAP

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LETTER OF TRANSMITTAL

August 18th, 1989,

Chief Gold Commissioner,
Mineral Resources Division,
Ministry of Energy, Mines and
Petroleum Resources,
Parliament Buildings,
Victoria, B. C.
V8V 1X4

Attention: Mr. T. Kalnins

Re: Bluebird Project
Slocan Mining Division, B. C.
File No. 24500-03-AME
Statement No. 000204
Assessment Report No. 18676

Dear Mr. Kalnins:

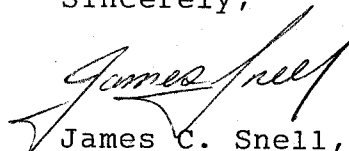
Please refer to previous submissions, and correspondence regarding assessment report requirements on the above project.

Please find under cover final assessment report submission for the 1988 period.

I anticipate that this submission should satisfy the demands of Mineral Tenure Act Regulations and along with previous documents forwarded "February 1989, Bluebird Project, Preliminary Geological Evaluation" and enclosed report "Preliminary Exploration Report July 1989" that this matter is now satisfactorily concluded.

Thank you for your consideration of this situation.

Sincerely,



James C. Snell, P. Eng.
Geological Engineer.

SUMMARY AND CONCLUSIONS

A very strong mineralized lode system has been identified on the Company property and has received intermittent exploration and development since the late 1800's.

During the period, part of the property was surveyed and mapped and 2100 feet of diamond drilling was completed in 1988. As a result of exploration work conducted to date 500,000 tons of possible ore have been designated as being amenable to open cut mining. Three drill holes intersected good ore values over moderate widths under the 2A adit which was opened for geological investigations.

A 2 phase exploration program has been recommended in order to prove the possible reserves. Fifteen thousand feet of drilling has been recommended to delineate the reserves at 80 ft. centers.

Due to favourable topographic features, persistent structure and consistent mineral values, consideration should be given to a strip mining operation should adequate ore grades and widths be encountered during the drill program.

Limitations on production will be severe winter climatic conditions a result of the high elevations of the deposits. Winter operations should not be considered. Should sufficient reserves be proven to justify production, the concentrator should be located in the valley in order to operate economically for twelve months of the

year. Mining operations would be conducted in summer months from May 15 to October 15.

A preliminary evaluation of the economics of a modest size surface operation, 250-300 TPD would require a minimum gross ore value of approximately \$100.00 per ton.

INTRODUCTION

During the 1988 field season, exploration diamond drilling was conducted on the Bluebird Claim under the supervision of M. J. Linn, geologist. Twelve holes were drilled for a total of 2100 feet. According to audited records \$109,703 was expended on exploration during the period. The cost of footage drilled was \$43.00 per foot, this includes mobilization, demobilization, road repairs, access road construction, drill site preparation, geological supervision, assays, travel and vehicles. The 2A Adit was also opened up at a cost of \$20,000. The program was completed in October, 1988 at which time all equipment was removed from the property. The writer, at the request of Mr. J. Hunyadi, Company President, closed the program down and reported the results.

PROPERTY

The property consisting of 12 contiguous mineral claims and fractions is held under option from Messrs. G. Sipos and F. Aldinger of Kaslo, B. C.

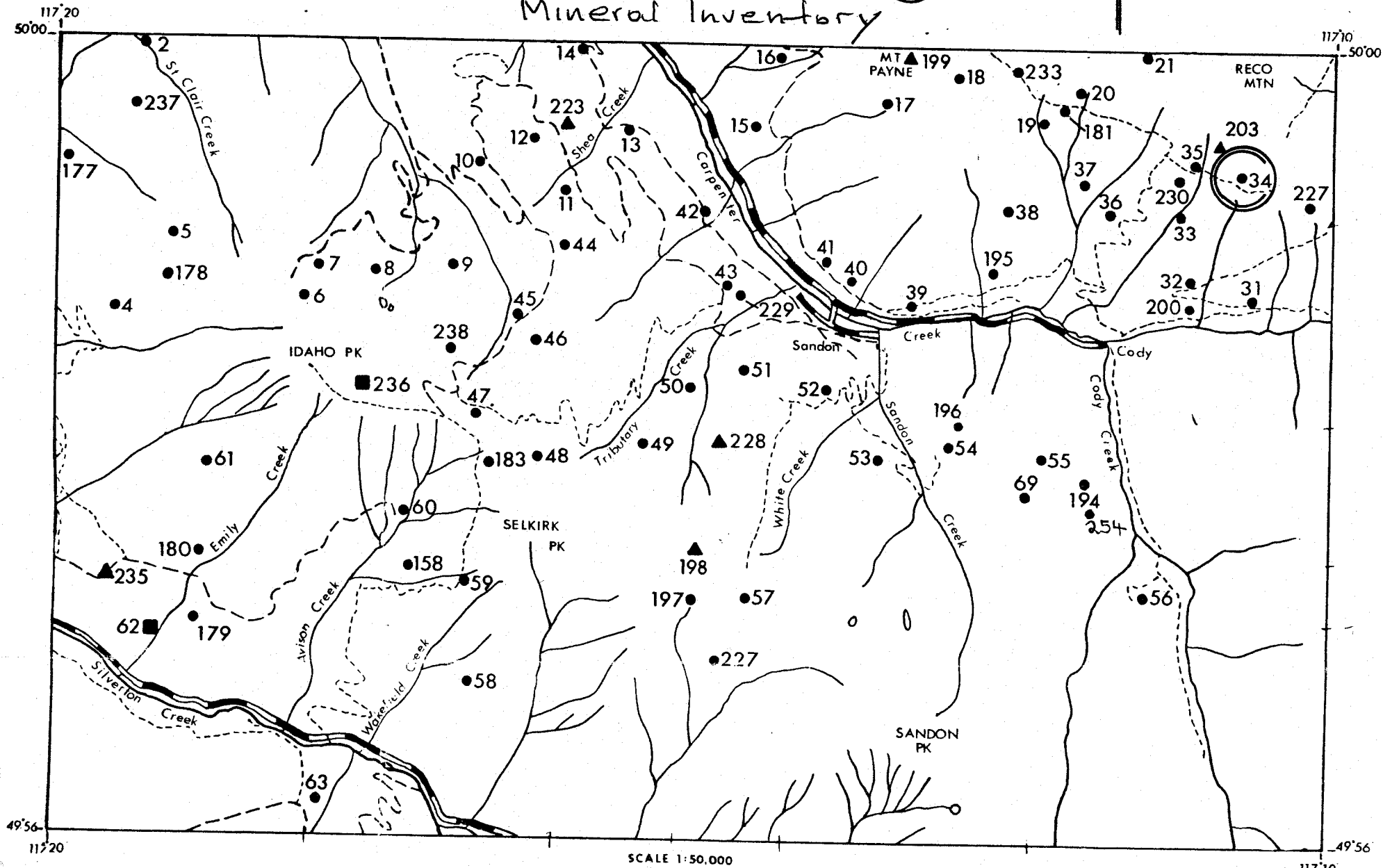
<u>CLAIM</u>	<u>RECORD NO.</u>
Stranger	18228
Bluebird	18229
Dunedin	18233
Egalite	18234
Faustina	643
Albatross Fr.	210
Ada Fr.	211
Edsi No. 1 (located)	841
Edsi No. 2 (located)	842
Stranger Fr. No. 1 (located)	1230
Stranger Fr. No. 2 (located)	1240
Belle Fr. No. 2 (2 located units)	3855



Province of British Columbia
Ministry of Energy, Mines and Petroleum Resources

LOCATION MAP (34) BLUEBIRD
Mineral Inventory

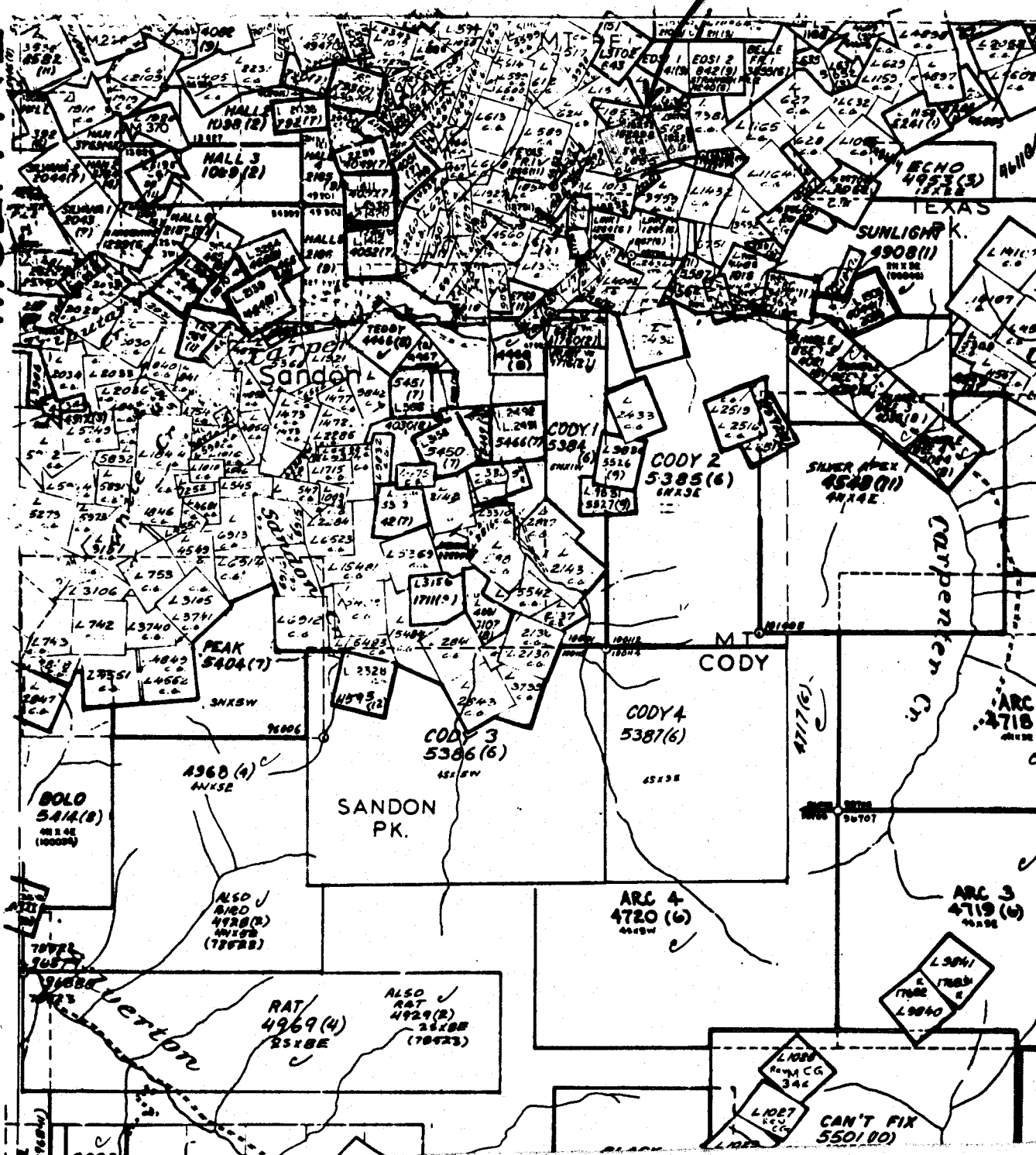
0 1000 m



CLAIM MAP
M82F/14E



0 500 1000 m



LOCATION AND ACCESS (50°00 N - 117°15W)

The property is situated six miles west of Slocan Lake and is 20 miles by road from New Denver and lies on the north slope of Carpenter Creek above Cody at the head of Jackson Basin.

The area can be reached by air to Castlegar, B. C. and by all weather paved road to New Denver. The claims can be reached by paved and gravel mine access road from New Denver.

HISTORY

The property was staked in 1892 and was prospected by several tunnels, shafts and trenches. The principal workings are on the Stranger and Bluebird claims on the north and south slope of the ridge of Reco Mountain.

In 1892 a trail was constructed up Jackson Creek and 600 feet of tunnel was driven. During the year 100 tons of ore was shipped with an average grade of 144 oz. Ag/ton and 71% lead. During the years 1892-1910, 1200 tons of ore was shipped. By 1894, 1800 feet of drifting and 200 feet of shaft were completed.

Workings on the Bluebird consist of six main adits and on the south slope extend to 900 feet below the ridge. The workings on the Stranger consist of two main adits 85 feet apart on the north slope in Jackson Basin.

GEOGRAPHY

TOPOGRAPHY

The property is located in the Selkirk Mountains which consist of rugged ridges of alpine character with the highest peaks reaching 9400 feet. The elevation at the property is 7000 feet.

CLIMATE

The climate of the area is moderate, summers are long and warm and at lower elevation, winter is from November to March. The average annual mean temperatures are 96°F to 4°F. Snow accumulation is severe at upper elevations and snowslides are common in early spring. The work season at higher elevations is from May until November.

VEGETATION

Timber growth at lower elevations in the district is dense, second growth northern coniferous rain forest and at higher elevations is alpine in character.

ECONOMIC GEOLOGY

Mineralization on the Bluebird Property consists of argentiferous galena and sphalerite in quartz, siderite gangue and host rock brecciation. The Bluebird lode strikes north easterly, dips south east at 65° and reaches maximum widths of about 35 feet. Mineralization is exposed for approximately $\frac{1}{2}$ a mile on the property and the Bluebird Lode can be traced for 4 miles from Robb Creek to Cody in the south west.

Three types of host rock can be identified:

- (1) Cretaceous - quartz porphyry (Nelson Pluton).
- (2) Triassic - slate (Slocan Series)
- (3) " - calcareous blocky argillites.

Mineralization within the slates consists generally of discontinuous lenses, veins and veinlets dispersed within the fault. Conditions within the slate beds are favourable for surface strip mining operations. At the 2A adit mineralization sampled over 25 feet assayed 17 oz. of silver to the ton.

Mineralization within the argillite beds is controlled by fissure filling and replacement rather than the stringer lodes common to the slates. Ore within both the slates and the argillites may be quite rich locally thereby enriching the entire width of the lode.

Mineralization within quartz porphyry intrusive dykes is confined by resistant wall rocks which has promoted true fissure filling and conditions favourable for underground mining of high grade ores located therein.

As well as variations in deposit characteristics, mineral zoning and surface enrichment is apparent in the project area. Above 6500 feet silver and lead appear to increase within the deposits and sphalerite appears to diminish. Secondary minerals such as, proustite, native silver and grey copper are common to near surface vein exposure and result in very high grade silver ores.

The lode system is persistent along strike and can be traced through the Chambers to the south and through the Fourth of July and Texas to the north east a distance of four miles.

The plutonic activity that created the regional fault systems in the older Triassic sediments is no doubt the intrusion of the Nelson Pluton. Two resultant directions of faulting appear to dominate (1) those that trend in a north westerly direction have been intruded by quartz porphyry (2) those that trend in a north easterly direction contain the mineral deposits.

It is possible that economic elements were sedimentary in origin and were mobilized from the sediments and redeposited all by hydrothermal activity related to the Cretaceous orogeny.

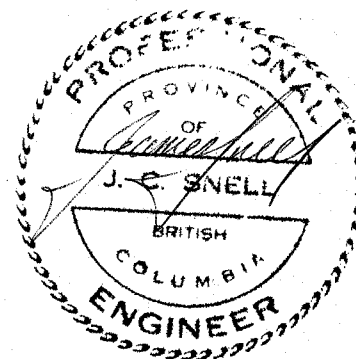
EXPLORATION PROGRAM AND BUDGETPhase I

(1)	Drilling - 5000 ft. @ \$30/ft.	- \$150,000
(2)	Survey control	- 27,500
(3)	Geological and Engineering	- <u>20,000</u>
	Subtotal	- \$197,500
(4)	Supervision 10%	- 19,750
(5)	Contingencies 20%	- <u>39,500</u>
	Total	- \$256,750 (\$250,000)

Phase II

(1)	Drilling -10,000 ft. @ \$30/ft.	- \$300,000
(2)	Geological and engineering	- <u>40,000</u>
	Subtotal	- \$340,000
(3)	Supervision 10%	- 34,000
(4)	Contingencies 20%	- <u>68,000</u>
	Total	- \$442,000 (\$440,000)

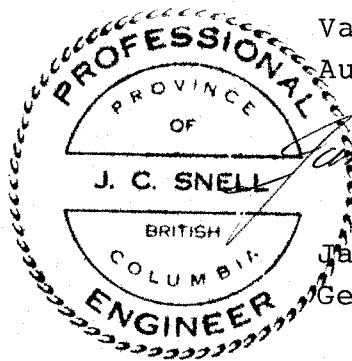
Total Phase I-II \$690,000
(\$700,000)



RECOMMENDATIONS

- (1) In the area around the Bluebird Property well mineralized lode systems cross many claim boundaries. To avoid litigation, it is necessary to know the location of claim boundaries and a survey is recommended.
- (2) The 1988 exploration program was successful in determining the location of the Bluebird lode. The drill program was successful in determining economic mineralization at depth. 500,000 tons of possible ore was assigned the property as a result of this work.

A two phase drill program is recommended to prove the possible reserves.



Vancouver, British Columbia
August 18, 1989

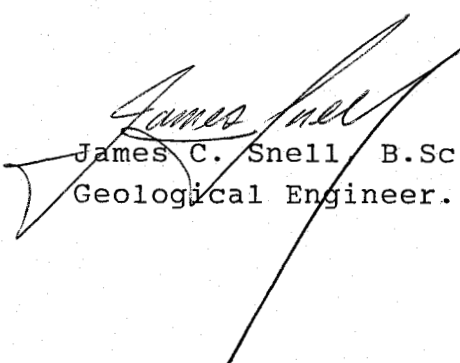
James C. Snell, B.Sc, P. Eng.
Geological Engineer.

COST STATEMENT FOR 1988 PROGRAM

(1)	Diamond drilling 2100 feet.	
(2)	Mobilization - demobilization.	
(3)	Geological and supervision.	
(4)	Access road and drill sites.	
(5)	Lodging, support, travel.	\$ 89,703.00
(6)	Adit rehabilitation	<u>20,000.00</u>

The total cost of the 1988 program for assessment: \$109,703.00

Drilling costs per foot - \$43.00


James C. Snell B.Sc., P. Eng.
Geological Engineer.

**CAMERON
PIETROBON
& WONG**

CHARTERED ACCOUNTANTS

Please Refer To Dennis N. Wong
 File No. 0201.0

February 9, 1989

Mr. Jim Snell
#500 - 890 West Pender Street
Vancouver, B.C.
V6C 1J9

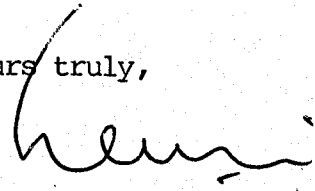
Dear Mr. Snell:

Re: Fireball Resources Ltd.

Based upon our review of the company's records, Fireball Resources Ltd. has incurred \$109,703 in exploration costs on the Bluebird Mineral Claim as at December 31, 1988.

Should you require any additional information, please do not hesitate to contact our office.

Yours truly,



CAMERON PIETROBON & WONG

DNW/nlp

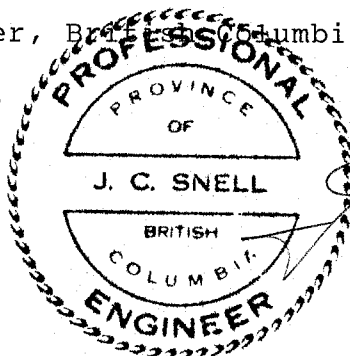
CERTIFICATE

I, James C. Snell with business and residential address in Vancouver, British Columbia, Canada do hereby certify that:

- (1) I am a consulting geological engineer.
- (2) I am a graduate of the Provincial Institute of Mining, Haileybury, Ontario, Canada (1959).
- (3) I attended the Colorado School of Mines, Denver, Colorado, U.S.A. (1960-1961).
- (4) I am a graduate of the Alaska School of Mines, University of Alaska, Fairbanks, Alaska, U.S.A. (1963).
- (5) I received a Bachelor of Science Degree in Geology (1964).
- (6) I am a Registered Professional Engineer of the Province of British Columbia (1975).
- (7) I examined the Bluebird Project during the summer of 1988 and I have arrived at the conclusions and have made the recommendations outlined in this report.
- (8) On the date of this report I have no interest in Fireball Resources Ltd. other than as a Consulting Engineer.
- (9) Consent is hereby granted to Fireball Resources Ltd. for the use of this report in corporate affairs.

Dated at Vancouver, British Columbia on the 22 day of

August, 1989.



James C. Snell, B.Sc. P. Eng.
Geological Engineer.

A P P E N D I X

PRELIMINARY ECONOMIC EVALUATION

The Bluebird Project offers good potential for a proposed strip mining operation to be conducted during six summer months between May 15 and October 15. The topography in the vicinity of the deposits is such that waste removal will be very cheap and aided by gravity as well a considerable pit depth can be achieved with few problems and expense.

The ore reserves outlined in this report have been classified as possible reserves and are based on minimum expected mining widths of 15 feet; and on structural continuity as well as consistent grade and distribution of mineralization on the property.

No grade estimates have been considered at this time, however cut-off grade requirements for a strip mining operation have been outlined based on a preliminary consideration of anticipated costs. Depending on the results of the drilling program detailed cost studies can be conducted at a later date. Determination of the reserve grade will be undertaken during and following the drill program.

PROPOSED CUT OFF GRADE - 250 TPD

Proposed Grade

Silver - 5 oz. per ton @ \$6.50 = \$32.50
Lead - 2.5% per ton @ 40¢/pound = \$20.00
Zinc - 2.5% per ton @ \$1.00/pound = \$50.00

or any combination Gross Value = \$102.50

Net Mill

Silver \$32.50 @ 85% = \$27.63
Lead \$20.00 @ 90% = \$18.00
Zinc \$50.00 @ 90% = \$45.00
Net Mill = \$90.63

Net Smelter

Silver - \$27.63 @ 85% = \$23.49
Lead - \$18.00 @ 65% = \$11.70
Zinc - \$45.00 @ 48% = \$21.60
Net Smelter = \$56.80 (\$57.00)

Net At 250 TPD = \$14,250.00

RECOMMENDED EXPLORATION PROGRAM

Phase I

- (1) Exploration Drilling 5000 ft.
- (2) Control and Topography Survey
- (3) Geochemical Soils Survey
- (4) Engineering and Geological survey calculations, geological mapping map and section preparation core logging-splitting, report
- (5) Supervision
- (6) Contingencies travel, lodging, roads, drillpads, assays.

Phase II

- (1) Exploration Drilling 10,000 ft.
- (2) Engineering - Geological core logging, splitting, sections tonnage calculations, report
- (3) Supervision
- (4) Contingencies travel, lodging, roads, drillpads, arrays

PRELIMINARY COST ESTIMATES - STRIPING MINING OPERATION

	Cost per ton	Cost per day
(1) Mining	\$6.00	\$1500
(2) Waste	\$4.00 (2:1 ore:waste)	\$2000
(3) Snow removal Road maintenance	\$5.00	\$1250
(4) Milling	\$20.00 (250 TPD)	\$5000
(5) Exploration Development	\$5.00	\$1250
(6) Transportation	\$10.00 (ore-concentrate)	\$2500
(7) Depreciation Amortization	\$5.00	\$1250
Total	\$55.00	<u>\$14,750</u>

These figures do not cover administration and profit.

SUMMARY AND CONCLUSIONS

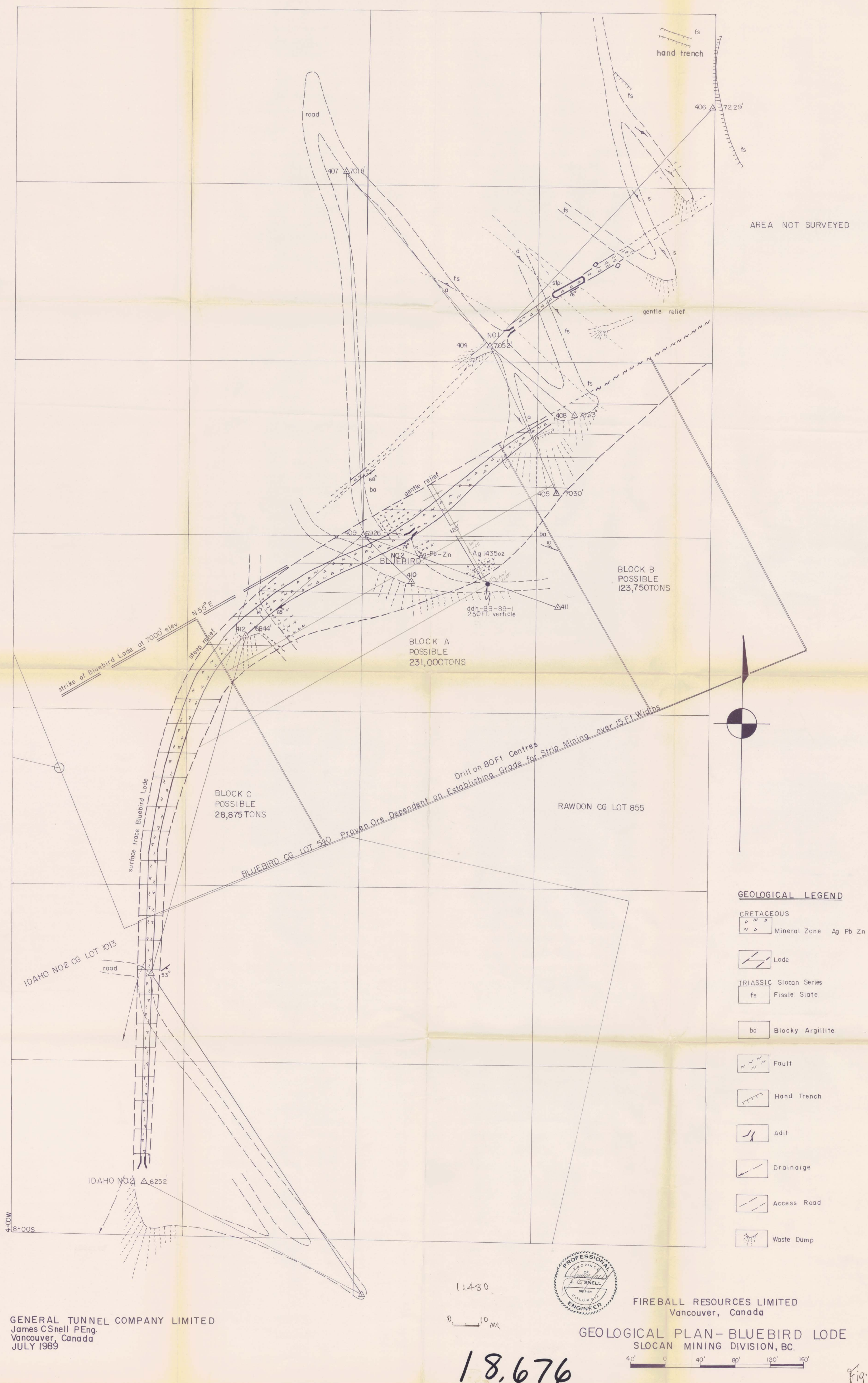
Two mineralized lode systems have been located on the Company property ten miles east of New Denver, B.C. The south part of the property has been surveyed and mapped indicating that the main Bluebird Lode extends for in excess of a half mile from the Idaho No.2 workings through the Bluebird and Stranger workings. The parallel Bluebird West Lode is located 350 feet to the northwest. 500,000 tons of possible ore in four blocks has been located on the property from which ore has been mined from underground workings in the past. No grade has been assigned at this time. Three holes drilled in 1988 intersected good grade silver values over narrow widths within ore block E on the Bluebird West Zone.

A 2 phase exploration program has been recommended in this report in order to prove the possible reserves. Fifteen thousand feet of drilling has been recommended to delineate the reserves at 80 foot centres. Proving up the surface of the deposits will require short drill holes which can be completed quickly and at low cost. Drill holes in the sediments should if at all possible be shorter than 300 feet.

Due to favourable topographic features, persistent structure, and values as well as good widths of mineralization, in excess of 25 feet; consideration should be given to a strip-mining operation should minimum ore grades requirements as detailed in this report be encountered during the drill program. The expense of underground development and mining within the sedimentary series might be justified after establishing a profitable surface mining operation. Potential for underground mining does exist and should be considered.

Limitations on production will be severe winter climatic conditions a result of the elevation of the deposits. Winter operations should not be considered. Should sufficient reserves be proven to justify production, the concentrator should be located in the valley in order to operate economically twelve months of the year. Mining operations would be conducted in the summer months from May 15 to October 15. The mill should be of modest size as a years mill feed would be mined in six months. The high cost of transporting ore to the mill might be reduced by installation of a tramline or by construction of a good quality road whichever is cheaper.

A preliminary evaluation of the economics of such an operation has been outlined in this report at a production rate of 250 TPD. The minimum gross value of ore required will be approximately \$100.00 per ton of which approximately 50% will be required to cover mining and milling costs and 50% for metallurgical losses and treatment changes. Adjustments can be made in the economics according to the results of the drill program.





FIREBALL RESOURCES LIMITED
Vancouver, Canada

BLUEBIRD PROJECT-REFERENCE MAP

SLOCAN MINING DIVISION, B.C.

100' 0 100' 200' 300' 400'

GENERAL TUNNEL COMPANY LIMITED
James C Snell P.Eng.
Vancouver, Canada
July 1989

18,676