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# GEOLOGICAL REPORT

ZAK CLAIM GROUP OMINECA MINING DIVISION D BRITISH COLUMBIA



Prepared For

GOLDPAC INVESTMENTS LTD. 922-510 WEST HASTINGS STREET VANCOUVER, B.C. V6B 1L8



GEOLOGICAL BRANCH ABESSMENT REPORT

by:

	SUB-RECORDER RECEIVED
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Ľ	VANCOUVER, B.C.

:	G.Leask,	BAS	c.
	January	28,	1991

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## APPENDICES

Appendix I Geochemical Analysis 🧹

## 1.0 SUMMARY

The ZAK claim group is located on French peak, 50km northeast of the town of Hazelton, British Columbia.

An impressive zone of massive and disseminated galena, sphalerite and chalcopyrite mineralization hosted within the Upper Cretaceous Brian Boru formation occurs on the property. Previous drilling along this zone yielded poor continuity, likely due to block faulting and offset. Recent work has indicated the mineralization and alteration to be of the Equity Silver, Sam Goosley deposit type.

During the 1990 field season 42 man-days were spent prospecting and geologically mapping the entire ZAK claim group. An extensive zone of galena, sphalerite stockwork mineralization was discovered north of the original showing in Hepworth Creek. This stockwork system adds an additional 1km of strike length to the known mineralization. In an unnamed drainage 1300m north of the main showing in Hepworth Creek a large pyrite, pyrrhotite, chalcopyrite rich boulder was discovered. This boulder returned assays of 0.13oz/ton gold and 0.5 percent copper. Silt geochemistry of main drainages draining into Hepworth Creek was conducted. Elevated Ag-Zn anomalies exist within this region (Fig.5 & Appendix I).

## 2.0 INTRODUCTION

The ZAK claim group was staked in late January 1989 to protect a previously known base metal-silver-gold mineral occurrence. The recent discovery of the Fireweed polymetallic prospect south of Old Fort Mountain has demonstrated the potential for the discovery of new polymetallic deposits of the Equity Silver type.

The ZAK property consists of 138 claim units as follows:

#### Table 1 - Claim Data

Claim	Name	Tag #/Record#	of Units	Expiry Date
ZAK	<b>\$</b> 2	10074	20	26/01/90
ZAK	#3	10075	8	26/01/90
ZAK	#4	10076	20	26/01/90
ZAK	#5	10077	18	26/01/90
ZAK	<b>#</b> 6	10078	18	26/01/90
ZAK	<b>‡</b> 7	10079	18	26/01/90
ZAK	#8	10080	16	26/01/90
ZAK	#10	10082	20	26/01/90
		Total	138	

Ongoing exploration efforts by Goldpac Investments in the Smithers region has identified structural and lithological similarities between the Equity Silver deposits (32,000,000 tons of Ag, Pb, Zn, Cu, Au, ore) and the ZAK property. Additional field studies will be required to determine the economic potential of the property.





#### 3.0 LOCATION, ACCESS & PHYSIOGRAPHY

The property is located 5.5 kilometers north of French Peak (Lat 55'3', Long 126'53') approximately 50km northeast of the town of Hazelton, B.C. (Fig 1). Access is by foot along an old trail which leaves from the southeast corner of French Peak. It is approximately a four hour walk into the prospect, alternatively a helicopter can be chartered from Smithers, B.C. with a one hour approximate flying time each way.

The region is typified by alpine type vegetation above 1800m elevation. Broad open valleys with steep cliff forming mountain ranges are the norm for the region.

#### 4.0 EXPLORATION HISTORY

Mineralization on the ZAK claims was first discovered by Falconbridge Nickel Mines Ltd. in July 1964 and staked as the Red Claims. The claims were subsequently forfeited and restaked in 1976 by Golden Gate Explorations Ltd.

Golden Gate conducted a 600m drill program on the existing mineralized area in Hepworth Creek. Drill results were inconsistent and the claims were allowed to lapse in 1985. Goldpac Investments restaked the claim group in January 1989.

#### 5.0 REGIONAL GEOLOGY

The region is underlain by sedimentary rocks of the Upper Jurassic Bowser Lake Group, Lower Cretaceous Skeena Group, and the volcanic rocks of the Upper Cretaceous Kasalka (Brian Boru) Group. Coeval with the Kasalka Group, Bulkley Intrusives, intrude the sedimentary assemblage. (Fig 3, Table 3)

These sedimentary and intrusive rocks comprise the bedrock across the Skeena Arch, a broad east-west trending structural zone that transects the central part of the Stikine Terrain (Monger 1984). Sedimentary rocks of the Upper Jurassic Bowser Lake Group were deposited in the Bowser Basin to the north of the arch. To the south, the area is underlain by volcanic rocks of the Lower to Middle Jurassic Hazelton Group, the Upper Cretaceous Kasalka-Brian Boru and the early Tertiary Ootsa Lake Groups. In the Late Cretaceous to Early Tertiary times, the Arch was the site of the development of numerous down-drop volcanic basins and caldera complexes with related sub-volcanic intrusive complexes. In the Late Tertiary, the Arch was the site of the development of a Basin and Range Horstgraben morphology that defines the present topographic geomorphology of West Central British Columbia.



#### TABLE 3

STRATIFIED ROCKS

UPPER CRETACEOUS

uK, BRIAN BORU FORMATION: acid to intermediate volcanics; rhyolite flows, breccia and tuff; biotite and hornblende porphyry flows, breccia, and lahar; tuffaceous siltstone, sandstone, conglomerate; minor basalt

## JURASSIC AND CRETACEOUS

JK, "Intermediate Bowser Lake subdivision": <u>Upper floodplain facies</u> (JKbuf), channel sandstone and conglomerate; subordinate overbank sandstone, siltstone, shale, and marl; minor coal; <u>Lower floodplain</u> <u>facies</u> (JKB1), interfingering channel sandstone-conglomerate and overbank sandstone, siltstone, shale, marl and minor coal; <u>Deltaic</u> <u>front (intertidal) facies</u> (JKBdf), interbedded channel and overbank facies, ripple and plane-laminated sandstone-siltstone, worm burrows and <u>Ostrea</u>-sandstone; <u>Lagoonal facies</u>, black siltstone, shale, lesser sandstone, minor limey nodules; Undifferentiated Bowser Lake Group (JKB)

### INTRUSIVE ROCKS

#### LATE CRETACEOUS

LK, BULKLEY INTRUSIONS: granodiorite, quartz diorite, quartz monzonite, hornblende porphyry, hornblende-quartz porphyry, undifferentiated

## 6.0 PROPERTY GEOLOGY

The property lies within the Upper Cretaceous Kasalka Group. Outcrop surrounding the mineralized occurrence is mainly exposed in the creek bed of Hepworth Creek. Sedimentary rocks exposed on the property are mainly lithic sandstones, black to grey argillites with minor brown sandstone and black to grey greywackes. These sediments are generally thin to thick bedded ranging from a few centimeters to generally less than 1 meter thickness. Sandstones and greywackes are fine to medium-grained, locally coarse grained pebble lenses are present.

Local bedding orientation in the mineralized region is 120' strike and 70' dip north. These readings change dramatically throughout the property as a result of shearing and flat faulting.

Sub volcanic Bulkley Valley Intrusions (LKB) present within the claim group mark core complexes of the cretaceous stratovolcanoes.

### 7.0 PROPERTY MINERALIZATION/ALTERATION

A zone of massive and disseminated sphalerite, galena, chalcopyrite, Ag-Au mineralization is located in the central portion of the ZAK 7 claim block (Fig 4). Mineralization is coplanar to bedding and hosted within intermixed sequences of thinly bedded quartzites and argillites. The massive mineralization achieves a width of 2 meters but thins to 20cm approximately 200m to the east along Hepworth Creek. A zone of fracture controlled stockwork and disseminated style mineralization exists immediately south of the main massive sulphide showing. This zone is typically pyrite with lesser amounts of galena, chalcopyrite and sphalerite. The mineralization shows characteristics similar to the Sam Goosley deposit being mined by Equity Silver. Structural complexities within the mineralized region have produced a discontinuous mineral horizon.

During the 1990 field season an extensive zone of stockwork mineralization was discovered in Hepworth Creek. This zone is contiguous with the initial discovery made in 1964. Mineralization is typically sphalerite, galena and trace chalcopyrite within a calcite gangue and is hosted within altered argillites and sandstones. Mineralized infills obtain widths of up to 30cm but are typically 10-15cm in width. This newly discovered mineralization extends the known strike an additional 1000m to the north.

In addition, in an unnamed drainage 1300m north (Fig.5) of the main showing, a large boulder (2.5m in diameter) of well mineralized float (subcrop) was discovered. Mineralization consists of pyrite, pyrrhotite, galena, sphalerite and chalcopyrite in a quartz gangue. Assays from the boulder yielded 0.13 oz/ton gold, 0.5% copper, 0.2% lead and 0.2% Zn. Another sulphide boulder discovered 500m from the junction of `1300' Creek and Hepworth Creek (Fig.5) yielded assays of 0.06oz/ton Au, 0.3oz/ton Ag, 0.3% Zn and 0.2% Pb. Both boulders have a moderate arsenic/antimony signature. Variable overburden cover has impeded the discovery of the boulders in outcrop. However, by the size and shape of these boulders it is the writers opinion that the bedrock source is very close in the order of 50 - 200m.

## 7.1 <u>Geochemistry - Rock Samples</u>

Sample #17751	Samples taken from a 3m diameter boulder located 150m west of
17752	the confluence of 1300m Cr. and Hepworth Cr. This float
	boulder is dominated by chalcopyrite, pyrite, pyrrhotite in a
	quartz gangue.

- 17753 Siliceous float boulder 10kg in weight located 400m west in 1300 drainage northside of the creek. Arsenopyrite, pyrite and a trace of galena in a siliceous gangue.
- 17754 Float boulder from main Hepworth Creek, disseminated sphalerite in a pyritic Brian Boru sandstone.
- 17755 Float boulder form 1300m creek, pyritic sandstone.
- 17756 Float boulder south side of 1300m creek, disseminated sphalerite in grey sandstone.
- 17757 Outcrop sample, Hepworth Creek, fractures filled with sphalerite in sandstone, very weak mineralization.
- 17758 Outcrop sample, Hepworth Creek, rusty weathering pyritic sandstone.
- 17759 Outcrop sample, Hepworth Creek, rusty pyritic sandstone.
- 17760 Outcrop sample, pyritic sandston, Hepworth Creek.
- 17761 Outcrop sample, pyritic rusty weathering, sandstone, Boomer Creek.

# 7.2 <u>Geochemistry - Silt Samples</u>

A total of twelve stream sediment samples were taken from drainages on the east side of Hepworth Creek. A thirty element ICP analysis was performed by Acme Analytical of Vancouver, B.C. Results of this sampling is presented in Appendix I, Samples ZT-90-53 to ZT-90-515.

## 8.0 MINERALOGY

In total, ten sulphide and sulphosalt minerals were found in the mineralized outcrops within the property. Quartz, siderite and tourmaline were the only gangue minerals present. Tourmaline is an abundant alteration mineral at the Sam Goosley deposit.

#### TABLE 2 - MINERALOGY

<u>Mineral</u>	Abundance	A	Abundant
		Tr	Trace
Galena	С	С	Common
Sphalerite	С	R	Rare
Chalcopyrite	A		
Pyrite	A		
Marcasite	С		
Pyrrhotite	С		
Covellite	Tr		
Stibnite	R		
Arsenopyrite	С		
Tetrahedrite	R		

## 9.0 RECOMMENDATIONS

The ZAK claim group represents a relatively untested mineral property of economic potential. A program of soil geochemistry as well as a geophysical I.P. Survey should be conducted over the areas west of and adjacent to the main showing in Hepworth Creek (Fig.5). An 8km long road should be constructed to provide vehicle access to the property. West Fraser has cruised the timber 2km north of the property and intends to log this area in the winter of 1991-1992. This would greatly reduce the cost of exploration on the property. Access to the property would then be achieved via the Babine Lake forest logging road.

## 10.0 CONCLUSIONS

Replacement, stockwork, and disseminated Cu-Au-Zn-Pb-Ag-Sb mineralization has been identified over a substantial area on the ZAK property. Mineralization and alteration types suggest the possibility of discovering a large Sam Goosley style ore deposit.

# 11.0 PERSONNEL

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Terry L. Eldridge Geologist	16 man-days 🖲 \$400/day	\$ 6,400
Gordon P. Leask Geologist	20 man-days 🖲 \$400/day	8,000
John M. Leask Geologist	7 man-days 🖲 \$400/day	2,800
Report Preparation	3 man-days 🖲 \$400/day	1,200
		\$18,400

# 12.0 STATEMENT OF EXPENDITURES

ITEM		ZAK	10		ZAK 3-8				
Geology									
T. Eldridge	3	days	\$	1,200.00	13	days	\$	5,200.00	
G. Leask	3	days		1,200.00	17	days		6,800.00	
J. Leask					7	days		2,800.00	
Food				200.00		_		330.00	
Assays				106.00				194.00	
Accommodation				200.00				200.00	
Truck Rental				870.00				720.00	
Fuel				348.00				300.00	
Helicopter				1,376.00				1,376.00	
Report preparation				600.00				600.00	
Typing/drafting			_	100.00				100.00	
Total			\$	6,200.00			\$1	L8,620.00	

10

# 13.0 REFERENCES

- Day, W.C. BCDM Assessment Report #11700, Report on Diamond Drill Program, Ag Claims, 6 Units, Record #480.
- Richards, T.A. Geological Survey of Canada, Geological Compilation, Open File 720.

## 14.0 STATEMENT OF QUALIFICATIONS

I, Gordon P. Leask, do hereby certify that:

- I am a geologist with resident at 1940 Chesterfield Avenue, North 1. Vancouver, B.C., V7M 2P5.
- 2. I am a graduate of the University of British Columbia with a Bachelor of Applied Science degree in Geological Engineering (1985).
- 3. I have been involved in mining exploration since 1979.
- 4. I directed the exploration effort on the ZAK claim group.

Jorda P. Curk Gordon P. Leask Mada P. Curk

APPENDIX 1

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#### ACHE ANALYTICAL LABORATORIES LTD.

#### 852 E. HASTINGS ST. VANCOUVER B.C. V6A 1R6 PHONE(604)253-3158 PAX(604)253-1716

GEOCHEMICAL ANALYSIS CERTIFICATE

Goldpac Investments Ltd. PROJECT ZAK File # 90-3557 Page 1 922 - 510 W. Hestings St., Vancouver BC V68 1L8

SAMPLE#	No	Cu	Pb	Zn	Ag	NI	Co	Hn	Fe	As	U	Au	Th	\$r	Cd	Sb	81	٧	Ca	P	La	Cr	Mg	Ba	71		AL	Ha	ĸ	V	MP	1
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	X	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	X	*	ppm	ppm	*	ppm	X	ppm	X	X	X	ppm	ppb	
C 17751 1300 a fund	1	5531	1845	210	27.2	14	26	12484	28 34	1004	13		1	2	2	- 25	28	5	04	001	2	12	16	1	01	2	12	01	01	4	4200	
C 17752, 50'Show	1	1181	901	415	27.9	6	29	2638	23.21	4197	5	NO	i	2	1.1	31	74	ý	.02	.001	2	5	.08	3	.01	2	.30	.01	.01	្នះ	2350	1.
C 17753644	3	86	1624	3162	10.8	24	12	148	14.71	6359	8	ND	1	5	16.9	3668	4	3	.03	.006	2	8	.01	6	.01	2	.07	.01	.04	2	1790	
C 1775427.30 017	1	65	165	1133	2.2	6	17	3594	10.79	84	5	ND	1	12	7.8	12	3	48	.54	.132	7	14	1.25	- 54	.01	4	.52	.01	.22	1	15	
C 17755GPL A. 2	3	16	16	121	.1	9	10	858	4.92	42	5	ND	1	52	.2	10	2	30	.83	.039	3	12	.50	64	.01	2	1.11	.04	.09	1	6	
C 17756 27-42-61		48	144	475	4	32	20	040	5 04	84	۲	-	•	25	τ.	•	2	41	37	0/6		27		144	<b>A1</b>	7	• • •		•4	•	7	,
C 177576-46 414	2	97	979	3217	1.5	22	14	1287	6.04	275	Ś		- i	83	13.0	Š	2	86	2.66	.079	10	27	.01	17	-01	8	2.18	.08	.03			
C 17758 2.3 ~ 3	1	55	1390	173	15.3	6	13	22063	6.22	776	5	ND	Ż	16	.4	1147	14	11	.50	.044	2	9	.39	24	.01	6	.29	.01	.19	Ś	37	
C 17759 ( =5-1	2	12	- 3	53	.1	8	9	755	4.45	28	6	ND	1	86	.2	2	2	38	1.03	.017	- 3	12	.69	- 45	.01	9	.53	.03	.11	2	3	
C 1776027 40 412	. 1	10	23	2	.4	22	- 34	102	6.92	29	5	ND	1	11	.2	5	5	5	.01	.006	2	3	.01	30	.01	11	.24	.01	.16	1	9	
C 17761 Barry CA	1	19	28	139	.1	16	19	1345	6.51	28	5	MD	1	30	.2	2	2	100	1.07	.060	•	42	01	97	-01	2	2.82	.04	.08			
STANDARD C/AU-R	20	63	41	133	7.5	72	32	1056	3.98	40	25	8	39	52	18.5	15	19	61	.52	.094	41	59	.92	183	.08	37	1.89	.07	.14	11	490	

ICP - .500 GRAM SAMPLE IS DIGESTED WITH 3ML 3-1-2 HCL-HN03-H20 AT 95 DEG. C FOR ONE HOUR AND IS DILUTED TO 10 HL WITH WATER. THIS LEACH IS PARTIAL FOR MN FE SR CA P LA CR MG BA TI B W AND LIMITED FOR NA K AND AL. AU DETECTION LIMIT BY ICP IS 3 PPM. - SAMPLE TYPE: P1 Rock P2 Silt AU® ANALYSIS BY ACID LEACH/AA FROM 10 GN SAMPLE.

17753. 298 m 130. Frech - Cepe flore 17758- 215 m & Megnino-th card - Masteiner souds have

17759 - 125 ... 5 on Hepsin - stack - UP//19

Goldpac Investments Ltd. PROJECT ZAK FILE # 90-3557

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SAMPLE#	Ho	Cu	Pb	Zn	Ag	NÍ	Co	Mn	Fe	As	U	Au	Th	Sr	Cd	Sb	8 i	٧	Ca	P	La	Cr	Mg	Ba	TI	B	AL	Na	ĸ	¥
	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	<b>X</b>	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	X	X	ppm	ppm	X	ppm	X	ppm	X	X	X	ppm
77-00-67	5	84	20	149	5	70	1/	17/1	2 74	/6	6		2	427	• 4	2	2	71	1 41	084	10	44	10	26.0	01	E 9		03	12	
21-90-33	6	01	20	100	.,	- 20	14	1.244	2.21	42	2		C	137	1.4	2	2	21	1.04	,000	13	10	.40	200	.01	21		.02	. 13	
ZT-90-55	2	62	- 58	612	.9	- 14	10	945	3.38	199	- 5	ND	2	125	2.4	5	2	- 32	1.14	.063	20	12	.33	159	.01	71	.39	.01	.09	1
ZT-90-56	2	56	41	252	.5	18	13	1002	3.75	147	5	ND	2	96	1.0	- 4	2	- 38	1.02	.077	18	12	.39	139	.01	91	.47	.01	.10	1
ZT-90-S7	1	57	51	230	.6	18	14	1776	4.07	117	5	ND	2	71	1.1	3	2	- 36	.84	.062	15	15	.37	201	.01	71	.27	.02	. 13	1
ZT-90-58	2	70	36	341	.7	14	13	6092	4.07	275	5	ND	1	159	2.4	2	2	27	2.02	.083	13	11	.28	423	.01	14 1	.02	.01	.06	1
2T-90-S9	1	57	24	303	.3	14	11	1810	3.54	161	5	ND	1	128	1.3	2	2	31	1.76	.094	11	10	.36	164	.01	18 1	.06	.02	.09	1
ZT-90-S10	1	37	72	313	.6	17	14	1292	4.50	119	5	ND	2	40	1.1	5	3	35	.41	.061	13	9	.28	237	.01	7	.98	.02	.12	1
ZT-90-\$11	1	35	66	325	.5	20	12	1464	4.04	162	5	ND	1	59	1.1	3	2	31	.67	.063	16	11	.25	268	.01	7 1	.22	.02	.15	1
ZT-90-S12	1	62	114	1593	1.1	34	14	2078	4.44	184	5	ND	1	40	8.3	2	2	32	.51	.079	17	10	.22	203	.01	4 1	.36	.01	.08	1
ZT-90-\$13	1	29	58	775	2.1	26	15	6354	4.06	80	5	ND	1	91	6.8	2	2	34	1.16	.106	15	8	.28	669	.01	4 1	.31	.01	.09	1
ZT-90-\$14	1	21	91	432	1.3	14	13	1739	4.30	78	5	ND	1	47	2.0	3	2	40	.54	.072	12	9	.32	229	.01	4	.99	.01	.08	1
ZT-90-\$15	1	10	44	227	.7	10	13	2774	3.53	30	5	ND	1	183	1.4	2	2	32	1.42	.102	14	6	.24	473	.01	6 1	.18	.01	.09	1
STANDARD C	18	56	41	130	7.1	72	31	1046	3.96	40	20	7	40	52	18.5	14	19	59	.51	.094	40	60	.89	183	.09	36 1	.89	.06	.13	12

Page 2

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