MAR 19750002: SPIONKOP CREEK

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MINERALS COAL OIL & GAS

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REPORT

ON THE

1974 FIELD INVESTIGATIONS ON THE

SPIONKOP CREEK PROPERTY

FOR

FRANCES CREEK MINES LTD.

Guy B. Allen, P. Geol.
Allen Resource Consultants Ltd.
January 28, 1975

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

19750002

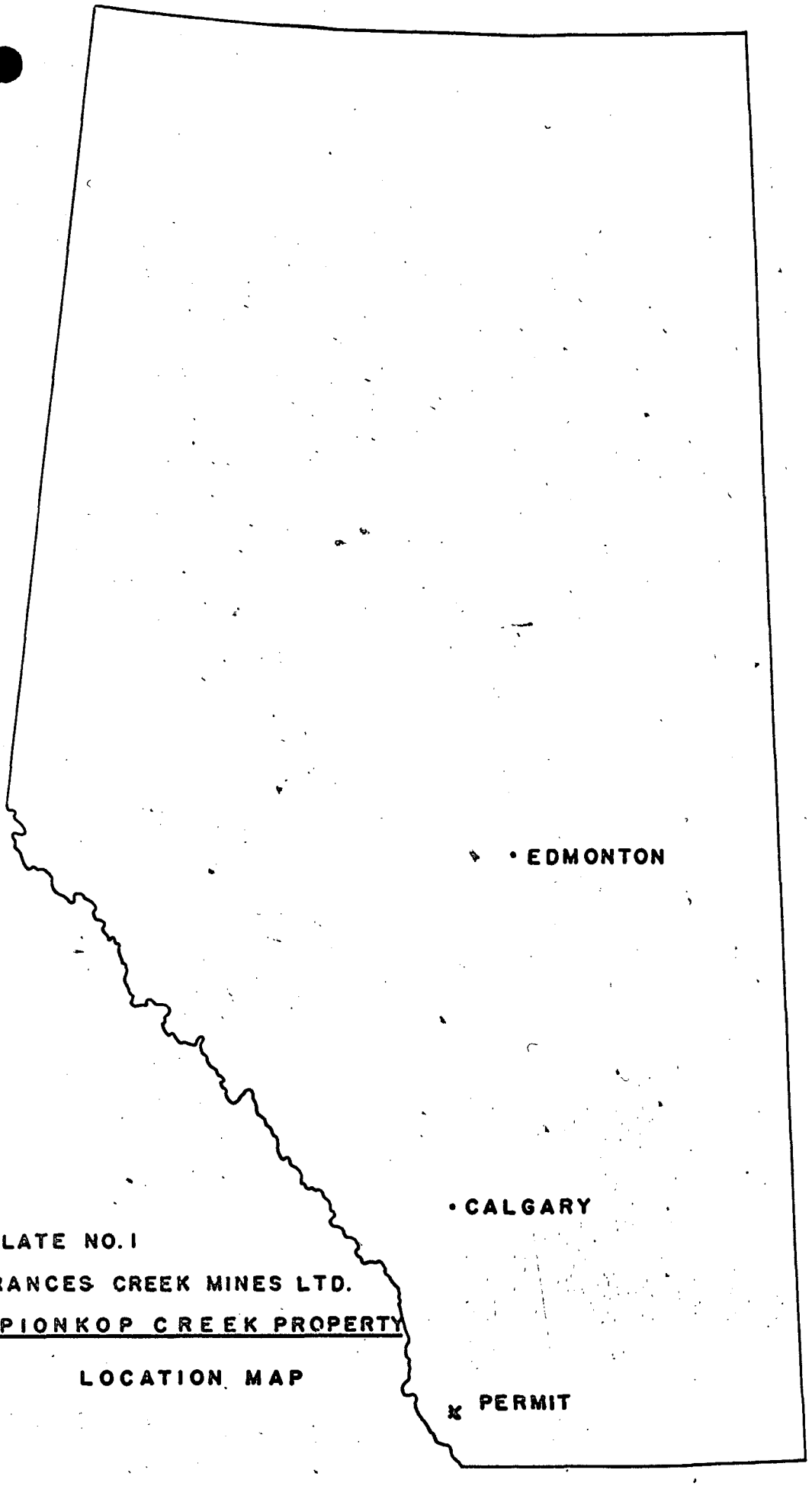

PLATE NO. I

FRANCES CREEK MINES LTD.

SPIONKOP CREEK PROPERTY

LOCATION MAP

To: FRANCE CREEK MINES LTD.,
409-603 Seventh Ave. S.W.,
Calgary, Alta.

File No. 7168
Date October 25, 1973
Samples Geo-chems

Certificate of ASSAY

LORING LABORATORIES LTD.

SAMPLE No.	PPM Cu	PPM Pb	PPM Zn
D 1	12	20	37
2	13	18	48
3	12	17	43
4	12	21	43
5	12	21	43
6	14	20	48
7	8	18	41
8	16	36	58
9	12	21	48
10	14	26	51
11	13	17	37
12	18	34	54
13	13	25	50
14	18	23	63
15	22	28	64
16	21	29	68
17	23	44	64
18	21	26	55
19	22	29	58
20	16	17	44
21	12	15	43
SD 1	5	14	63
2	48	26	58
3	3180	360	2000
4	9	10	50
5	12	20	67
6	14	33	67
7	18	42	84
8	17	39	67
9	20	33	91
10	18	44	78

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES . . . .

Rejects Retained one month.

Pulps Retained one month unless specific arrangements made in advance.

[redacted]
Licensed Assayer of British Columbia

To: FRANCES CREEK MINES LTD.,
409-603 Seventh Ave. S.W.,
Calgary, Alta.

File No. 7168
Date October 25, 1973
Samples Geo-chems

Certificate of ASSAY

LORING LABORATORIES LTD.

SAMPLE No.	PPM Cu	PPM Pb	PPM Zn
SD 11	14	21	62
12	14	18	80
13	17	48 ✓	112 ✓
14	34 ✓	190 ✓	160 ✓
15	10	20	55
16	11	17	46
17	13	20	53
18	16	20	49
19	12	21	49
20	12	18	42
21	8	14	43
22	12	17	54
23	10	17	53
24	13	14	42
25	12	14	43
26	16	42 ✓	58
27	20	28	68
28	22	29	63
29	18	26	74
SD 30	18	34	68
31	13	25	72
32	18	39 ✓	91 ✓ ? where is it?
33	16	33	72
34 *	18	53	74
35 *	14	44	88 ✓
36	20	23	62
37	20	36 ✓	71
38	16	31	64
39	14	29	64
SP 1	14	20	49
2	11	15	46

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* [redacted]ck Sample

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[redacted]

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Date October 25, 1973
Samples Geo-chems

Certificate of ASSAY

LORING LABORATORIES LTD.

SAMPLE No.	PPM Cu	PPM Pb	PPM Zn
SP 3	13	17	45
4	26	23	49
5	12	14	53
6	14	18	54
7	20	20	70
8	16	18	64
9	10	29	56
10 *	420	63	350
11	16	26	63
12	12	17	63
13	16	20	150
14	18	17	75
15	17	31	99
16	13	20	65
17	14	28	95
18	12	29	69
19	16	34	69
20	36	17	69
21*	91	36	95
22	17	18	80
23	10	18	70
24	10	20	55
25	18	20	52
26	17	21	71
27	12	25	58
28	16	28	61
29	18	26	95
30	4	10	41
31	11	14	41
32	14	14	56
33	10	14	43

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* Rock Sample

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To: FRANCES CREEK MINES LTD.,
409 - 3 Seventh Ave. S.W.,
Calgary, Alta.

File No. 7168
Date October 25, 1973
Samples Geo-chems

Certificate of ASSAY

LORING LABORATORIES LTD.

-4-

SAMPLE No.	PPM Cu	PPM Pb	PPM Zn
SP 34	20	20	63
35	22	34	53
Y 1	25	39	99
2	22	36	112
3	20	34	66
4	18	34	89
5	16	33	61
6	17	36	87
7	27	33	73
8	18	26	88
9	20	26	91
10	27	31	93
11	17	21	78
12	14	23	75
13	22	34	100
14	20	26	80
15	27	39	67
16	14	20	69
17	22	28	100
18	18	21	70
19	21	20	68
20	20	23	77
21	25	23	75
22	16	26	77
23	18	55	88
24	18	18	50
25	16	20	61
26	13	20	64
27	10	17	58
28	10	14	55
29	13	12	48

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES . . . .

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Pulps Retained one month unless specific arrangements made in advance.

[redacted]

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To: FRANCES CREEK MINES LTD.,
409-6 Seventh Ave. S.W.,
Calgary, Alta.

File No. 7168
Date October 25, 1973
Samples Geo-chems

Certificate of ASSAY

LORING LABORATORIES LTD.

-5-

SAMPLE No.	PPM Cu	PPM Pb	PPM Zn
Y 30	25	21	70
31	7	20	46
32	16	21	63
33	14	21	58
34 *	20	50	90
35	16	29	70
36	29	20	71

*Rock Sample

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES . . . .

Rejects Retained one month.

Pulps Retained one month unless specific arrangements made in advance.

[redacted]

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A P P E N D I X 'B'

Rock Sample Analyses

To: FRANCES CREEK MINES LTD.,
409, 3-7th Ave. S.W.,
CALGARY, Alta.

File No. 7250
Date November 12, 1973
Samples Geo-chems

Certificate of ASSAY

LORING LABORATORIES LTD.

SAMPLE No.	PPM Cu	PPM Pb	PPM Zn
T1-22	405	48	77
23	94	28	125
24	7900	29	165
25	675	36	155
26	620	25	170
27	182	38	165
28	405	42	140
29	375	46	170
31	166	34	125
32	600	38	100
T2-30	1320	65	40
33	170	33	109
34	1020	31	112
35	174	26	117
37	465	21	117
38	360	17	121
39	710	26	130
40	470	21	100
T8-36	31	18	112
T10- 1	3080	25	28
T10- 2	333	28	40
T10-21	1420	190	39

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES . . . .

Rejects Retained one month.

Pulps Retained one month unless specific arrangements made in advance.

[redacted]

Licensed Assayer of British Columbia

To: FRANCES CREEK MINES LTD.,
409, (-7th Ave. S.W.,
Calgary, Alta.

File No. 7250
Date November 14, 1973
Samples Geo-chems

Certificate of ASSAY

LORING LABORATORIES LTD.

SAMPLE No.	PPM Cu	PPM Pb	PPM Zn
T11- 3	178	170	39
4	91	31	80
5	77	23	109
6	46	33	39
T12- 7	68	45	135
8	74	25	155
T13- 9	690	25	121
T14-16	94	20	99
17	142	1260	170
17A	31	100	43
18	975	65	195
19	86	33	165
20	850	290	140
T15-10	485	29	140
11	94	790	52
12	32	530	65
13	855	31	35
14	460	29	140
15	333	50	32
R.S. No 41	4975	980	117

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES . . . .

Rejects Retained one month.

Pulps Retained one month unless specific arrangements made in advance.

[redacted]

Licensed Assayer of British Columbia

A P P E N D I X 'C'

Rock Sample Descriptions

ROCK SAMPLE DESCRIPTIONS

Number	Lithology	Description
T1-22	Limestone float	- medium grey, compact dense, slight pinpoint mottling of light and dark, banded, 1"-2" bands, slightly oolitic, no visible sulphides.
T1-23	Andesite float	- partly amygdaloidal, black, fine grained, some brownish tinge, occasional medium grained hornblende crystal, disseminated sulphides pyrite and chalcopyrie as trace.
T1-24	Andesite float	- as described above, fair disseminated sulphides.
T1-25	Andesite float	- as described above, trace sulphides
T1-26	Andesite float	- as described above, trace sulphides
T1-27	Andesite float	- as described above, with veinlets of white crystalline quartz, trace sulphides
T1-28	Andesite float	- as described above, with veinlets of white quartz, trace to poor sulphides
T1-29	Andesite float	- as described above, quartz and calcie in amygdules, slight trace sulphides
T1-31	Andesite float	-- as described above, quartz veinlets, trace of sulphides
T1-32	Andesite float	- as described above, veinlets and amygdules of white calcie and quartz, slight trace of sulphides.
T2-30	Quartzite float	- fine grained, slight metamorphism, light grey, fractured with calcite in fractures, disseminated sulphides, chalcopyrite and pyrite
T2-33	Andesite float	- as described above
T2-34	Andesite float	-- as described above
T2-35	Andesite float	- as described above, with veinlets and amygdules of white quartz, trace sulphides
T2-37	Andesite outcrop	- as described above, with amygdules filled with quartz and calcite, slight trace sulphides
T2-38	Andesite outcrop	- as described above, veinlets and amygdules of white quartz, trace sulphides
T2-39	Andesite outcrop	- as described above, trace sulphides
T2-40	Andesite outcrop	- as described above, large amygdules filled with quartz and calcite, trace sulphides

Number	Lithology	Description
35-36	Andesite float	- as described above, occasional quartz filled amygdule, very slight trace of sulphides
T10-1	Sandstone outcrop	- well rounded sand grains, well cemented, light grey, slightly metamorphosed, fractured, very slightly calcareous, argillaceous, trace sulphides
T10-2	Sandstone outcrop	- slightly metamorphosed, white quartz sand grains, non-calcareous but with elongate dolomite inclusions, medium grey, very fine grained, argillaceous, brecciated appearance, no visible sulphides.
T10-21	Sandstone float	- fine grained, rounded sand grains, good cementing, slightly metamorphosed, very slightly calcareous, well spotted with pinhead marcasite concretions, light grey, medium brown on weathered surface.
T11-3	Diorite float	- fine to medium grained, dark grey to black, uniform texture and colour, some green tint, gossaned on weathered surface, massive, blocky, no visible sulphides
T11-4	Diorite float	- as described above, no visible sulphides
T11-5	Andesite float	- as described above, with calcite filled amygdules, no visible sulphides
T11-6	Argillite float	- medium to dark grey, very fine grained, part very calcareous, part sandy, massive, blocky, calcite veining, no visible sulphides.
T12-7	Andesite float	- as described above, calcite in amygdules, no visible sulphides
T12-8	Andesite float	- as described above, partly vesicular, no visible sulphides
T13-9	Andesite float	- as described above, trace sulphides
T14-16	Andesite float	- as described above, large amygdules with quartz and calcite, no visible sulphides
T14-17	Andesite float	- as described above, with occasional calcite filled amygdule
T14-17A	Sandstone float	- very calcareous in dark bands and limestone-very sandy as light bands, bands alternate, trace sulphides
T14-18	Andesite outcrop	- as described above
T14-19	Andesite outcrop	- as described above, with quartz veinlets, slight trace sulphides

Number	Lithology	Description
T14-20	Argillite float	- as described above, with trace of sulphides
T15-10	Andesite outcrop	- as described above, occasional quartz filled amygdule, trace sulphides
T15-11	Limestone float	- fine to medium grained, light to medium grey, partly siliceous, partly oolitic, partly fragmental, slight trace sulphides.
T15-12	Limestone outcrop	- light to medium grey, weathers light brown, argillaceous, very fine grained, massive, dense, no visible sulphides.
T15-13	Dolomite outcrop	- fine grained, light to medium brown, uniform texture and color, massive , blocky, no visible sulphides.
T15-14	Andesite float	- as described above, slight trace sulphides
T15-15	Siltstone float	- very fine grained, very hard, sharp, angular, slightly calcareous, light grey, partly fractured, weathers light brown, no visible sulphides.
RS41	Sandstone float	- well rounded sand grains, salt and pepper appearance, rust stained, fine to medium grained, trace disseminated sulphides.

Introduction

During the period October 25, and November 2nd to 4th inclusive, 1974, a program of detailed prospecting was conducted by Mr. William James, P. Geol., for Frances Creek Mines Ltd. on their Quartz Mineral Exploration Permit No. 175, in southwestern Alberta.

The purpose of the program was to prospect in detail five promising areas as defined by the 1973 exploration work.

The results of this work along with pertinent notes on the prospect and surrounding areas make up the bulk of this report.

The author did not visit the property in 1974.

Summary

During October and November, 1974, Frances Creek Mines Ltd. conducted a detailed prospecting program on five local areas of its 9,650 acre Quartz Mineral Exploration Permit No. 175, located in Townships 2, 3, and 4, Range 1W5, approximately 175 miles south of the City of Calgary, in the Province of Alberta.

The Permit area lies along the eastern front of the Clark Range of the Rocky Mountain system. Relief is moderate to rugged and access is from Highway No. 6 by secondary roads along Yarrow, Spionkop, South Drywood, and Drywood Creeks.

Mineral exploration has been carried on sporadically for a number of years in the Clark Range. Most recently Kintla Explorations Ltd. have outlined probable reserves of over 4 million tons of 1.5% copper or better on their property just to the east of Permit No. 175.

The Clark Range is formed of a slice of Precambrian sedimentary formations thrust over Paleozoic and Mesozoic strata. Within the Permit boundary sediments of the Grinnell, Siyeh, Sheppard and Gateway formations outcrop along with Purcell andesitic lavas. Copper, lead, silver and zinc mineralization has been found primarily in the Grinnell and Purcell strata and to some extent in the Sheppard formation.

The 1974 exploration program of Frances Creek Mines Ltd. located no significant concentrations of copper, lead, or zinc in rocks outcropping within the five local areas examined. It is considered that mineralized float samples discovered in 1973 either had sources outside the Permit, or were of very local extent and hence difficult to locate.

No further work is recommended for this Permit.

Description of Property and Ownership

The Spionkop Creek property is composed entirely of Quartz Mineral Exploration Permit No. 175, of which the Schedule is as follows:

IN TOWNSHIP TWO (2), RANGE ONE (1), WEST OF THE FIFTH (5) MERIDIAN:

That portion of Section Thirty-five (35) lying outside the Waterton Lakes National Park Boundary;

AND

IN TOWNSHIP THREE (3), RANGE ONE(1), WEST OF THE FIFTH (5) MERIDIAN:

The North West quarter of Section one (1); Section Two (2), the North half and South East quarter of Section Three (3), the North half of Section Four (4), the North East quarters of Sections Five (5), and Eight (8), Section Nine (9), the South half and North West quarter of Section Ten (10), the West half of Section Fifteen (15), Section Sixteen (16), the East half of Section Seventeen (17), the North half of Section Twenty (20), the North half and South East quarter of Section Twenty-one (21), Section Twenty-two (22), the North half and South West quarter of Section Twenty-six (26), the North half of Section Twenty-seven (27), Section Twenty-eight (28), the South half and North East quarter of Section Twenty-nine (29), the North East quarter of Section Thirty-two (32), the West halves of Sections Thirty-three (33) and Thirty-four (34), the South East quarter of Section Thirty-five (35) and the South West quarter of Section Thirty-six (36) and that portion of the South West quarter of Section Three (3) lying outside the Waterton Lakes National Park Boundary;

AND

IN TOWNSHIP FOUR (4), RANGE ONE (1), WEST OF THE FIFTH (5) MERIDIAN

The West half of Section Five (5);

containing an area of Nine Thousand, Six Hundred and Fifty (9,650) acres, more or less.

The Permit, registered with the Government of Alberta on February 19, 1973, is held 100% in the name of Frances Creek Mines Ltd.

Claims to the north and east adjoining the Frances Creek lands are held by Kintla Explorations Ltd.

Recently, the area of the Eastern slope of the Rocky Mountains was withdrawn from further staking pending the results of ecological and environmental studies.

Location

The Spionkop Creek property is located in portions of Townships 2,3, and 4, Range 1W5, as described above, in the Province of Alberta. It is about 175 miles south of the city of Calgary and approximately 25 miles southwest of the town of Pincher Creek at Latitude 49°13' and Longitude 114°04'. A portion of the southern border of the Permit adjoins the northern boundary of Waterton National Park.

Accessibility

The Permit area is easily accessible from Highway No. 6 by a turnoff to the west on a secondary road approximately two miles south of the village of Twin Butte, Alberta.

Gravelled and four-wheel drive roads follow the valleys of Yarrow, Spionkop, and South Drywood Creeks.

Physiography

The subject area lies along the eastern front of the Clark Range of the Rocky Mountain System. This range consists of Precambrian Purcell formations which have been thrust eastward.

East of the permit area the foothills form low, northwest-trending parallel ridges underlain by deformed Cretaceous strata.

Within the Permit area the northeast-trending ridges generally reach elevations above 8000' ASL. Intervening valleys average 4000' to 5000' ASL.

Slopes are moderate to steep.

History

This general area has been explored actively for oil and gas in recent years. Within the Waterton Field, natural gas is produced from over 10,000 feet below the surface and is piped to the Shell Oil Co. gas plant south of Pincher Creek.

Mineral exploration in the Clark Range has been sporadic. Kennco Exploration Ltd. investigated the copper deposits now held by Kintla Explorations Ltd to the east of Permit No. 175 and probably examined part of the Frances Creek Ground, although no record of any such work was available to the author. Cominco Ltd. and Falconbridge Nickel Mines Ltd. have also been active in the general area

Kintla Explorations Ltd. is presently exploring their Big Horn claims group which is just to the east of the Frances Creek Mines Ltd. Permit. On this property Kintla reports probable reserves of over 4 million tons of 1.5% copper or better in six zones.

In 1973 Frances Creek Mines Ltd. conducted a reconnaissance prospecting and geochemical exploration program on Quartz Mineral Exploration Permit No. 175. This work defined a number of local areas warranting further exploration.

Frances Creek Mines Ltd. - 1974 Exploration Program

As a result of the 1973 exploration a number of areas within the Permit were delineated as warranting further investigations in order to determine the source of mineralized float occurrences and geochemically anomalous stream sediments. It was recommended that detailed prospecting and stream sediment analyses be carried out in these local interest areas as a first step in locating the mineralized sources in place. This was to be followed by detailed mapping and sampling of any uncovered zones of mineralization.

Unfavorable conditions for performing meaningful geochemical work eliminated the suitability of this phase of the program, and the initial stage of the work was confined to conventional prospecting of the interest areas with detailed examination of rock outcrops.

The areas examined are described below. On Figure No. 1 the boundaries are defined, traverses plotted, and sampled areas located.

Area A - This includes Sections 2 and 3, and the NW¼ of Sec. 1, Tp. 3, Range 1W5. In 1973, three creeks draining this area were found geochemically anomalous and seven float samples of Purcell volcanics were found with copper concentrations up to 0.8%. Examination of this area in 1974 located these rocks in place only near the head of the most easterly of the three creeks in Sec. 35, Tp. 2, Range 1W5. Here, a relatively narrow zone of andesite is bounded above and below by argillites. No sulphide mineralization was observed. It is suggested that the source of the mineralized float is at higher elevations outside the Permit boundaries.

Area B - The SW¼ Sec 36, SE¼ Sec. 35, N½ Sec. 26, and the NW¼ Sec. 27, Tp. 3, Range 1W5 make up this interest area. Stream sediment samples showed high values for copper, lead and zinc, and a sandstone sample taken from outcrop assayed 0.308% in 1973. Detailed examination of the area, although locating a sandstone zone of the Grinnell formation, failed to find the mineralized outcrop, or any others showing sulphides other than pyrite. The Grinnell formation, as observed, was composed of sandstones grading to quartzites, and argillites. Outcrops were discontinuous. It is suggested that the 1973 occurrence may be of such limited extent to escape detection in 1974.

Area C - A small area occupying the W½ Sec. 34, Tp. 3, Range 1W5 yielded high lead and zinc values in stream sediments, and a piece of diorite float with galena. The 1974 examination in this area located a sedimentary sequence with a local andesite sill, but no dioritic material in place. Only traces of sulphides were evident in the strata.

Area D - This is the NE¼ Sec. 32, Tp. 3, Range 1W5. One stream sediment sample gave a high lead reading and a piece of andesite float had slight copper mineralization in 1973. In 1974, massive, coarse grained, amygdaloidal andesite was found in place, but was sparsely mineralized with pyrite.

Area E - In the north corner of the Permit, the NW¼ Sec. 5, Tp. 4, Range 1W5 had one stream sediment sample anomalous for lead and a piece of siltstone float assaying 0.03% copper in 1973. The 1974 examination failed to locate the siltstone outcropping within the Permit boundaries.

Regional Geology

The Clark Range of mountains is given form as an easterly thrust and upturned assemblage of Precambrian sedimentary strata extending northwestward from the Canada-United States border. The formations consist of argillites, siltstones, sandstones and carbonates with andesite sills and cut locally by dykes of chloritized diorite. The entire Precambrian sequence overlies Paleozoic and Mesozoic strata and is separated unconformably from this younger sequence by the Lewis Thrust Fault.

Geology of the Prospect Area

Within the Permit boundaries only Precambrian strata are exposed. These rocks have a regional northwest strike with generally low to moderate dips to the southwest. The formations underlying the property, starting with the oldest, are as follows:

1. Grinnell Formation - The Grinnell consists of bright red argillites in the lower portion with progressively thicker interbeds of red and white quartzitic sandstone toward the top. This formation occurs only in SW¼ Sec. 36, and the SE¼ Sec. 34, Tp. 2, Range 1W5 of the Permit

2. Siyeh Formation - These rocks underly most of the subject area and consist of dolomite and limestone with argillite and sandy interbeds. The carbonate occurs in various hues and degrees of purity.
3. Purcell Lava - This is a zone of greenish chloritized andesite which forms an easily recognized stratigraphic marker in the area. It is approximately 250' to 300' thick
4. Sheppard Formation - These sediments, consisting of sandstones, dolomites, argillites, siltstones, and minor andesites occur on the ridges in the western portion of the Permit area.
5. Lower Gateway Formation - This zone of red and grey argillites with minor sandstones and dolomite may occur in the western part of the Permit on the ridge between Spionkop Creek and Yarrow Creek.

Economic Geology

The Clark Range, being primarily sedimentary, has historically not been considered an important metallogenic area. However, within this group of mountains mineralization has been recorded in recent years in the Grinnell, Siyeh, and Sheppard formations and in the Purcell Lavas.

Within the Grinnell formation chalcocite with minor bornite, chalcopyrite and malachite has been found in the sandstone beds and in dykes and sills of igneous material that cut the formation. Mineralization in the sandstone appears to follow the bedding indicating the original mineralizing solutions followed bedded porosity zones in moving through this material. The Grinnell contains copper on the Kintla Explorations Ltd. ground just to the east of Permit No. 175.

The Siyeh formation has sulphide gossans near Commerce Peak in British Columbia and has been reported to contain lead-silver mineralization near Spionkop Creek.

Copper mineralization has been found in the upper two feet of the Purcell Lavas near North Kootenay Pass on the Alberta-B.C. border. This is also believed to be the main host rock for Kintla Explorations Ltd's substantial reported copper reserves on the Big Horn claims east of Permit No. 175.

The Sheppard formation has been reported to contain lead-zinc mineralization in its upper part, 30 miles west of Pincher Creek, and chalcopyrite in its basal unit near North Kootenay Pass

The mineralization in the Precambrian rocks of the Clark Range is thought to have a hydrothermal origin with mineralizing solutions travelling up major fault channels and passing into and being deposited in the more porous sedimentary zones. Mineralized dyke and sill material was possibly injected at the same time.

Conclusions

The reconnaissance prospecting and geochemical surveys of 1973 pointed out a number of local areas within the Permit boundaries which warranted further investigations.

Detailed prospecting and sampling of outcrop areas within these interest areas in 1974 failed to yield encouraging results.

It is considered that the 1973 geochemical results may have been misleading. Stream sediment samples were taken late in the fall when the creeks were low. As these waterways drain areas of varying rock types, there may have been a number of false anomalous concentrations caused by Ph variations. This was not investigated.

Sources of mineralized float samples are believed to be either outside the Permit area, or of such small areal extent to be located only with difficulty.

The results from the 1974 exploration into the five local areas was insufficiently encouraging to justify further work in the area.

Recommendations

No further exploration is recommended for Quartz Mineral Exploration Permit No. 175.

References

1. Agarwal, R. G., 1973 — Recommendations for Field Program on Permit No. 175, Waterton Area, Southwest Alberta, of Frances Creek Mines Ltd.

2. Allen, G. B., 1973 — Report on the Spionkop Creek Property of Frances Creek Mines Ltd., Jan. 10, 1973

3. Allen, G. B., 1973 — Report on the Spionkop Creek Property of Frances Creek Mines Ltd., Dec. 1, 1973

4. George Cross Newsletter — Kintla Explorations Ltd; No. 134 July 11, 1973

5. Price, R. A., 1962 — Fernie Map-Area, East Half, Alberta and British Columbia, Geol. Sur. Can. Paper 61-24.

Allen Resource Consultants Ltd.
Guy B. Allen
Jan. 28, 1975

CERTIFICATION

I, Guy B. Allen, residing at [redacted], Calgary, Alberta do hereby certify:

1. That I am a consulting geologist.

2. That I am a Professional Geologist registered in the Province of Alberta (#20282), and a Professional Engineer registered in the Province of British Columbia (non-resident status).

3. That I am a graduate of the University of Western Ontario where I received the degree of BSc in Geology in 1957.

4. That I have practiced my profession for over 13 years.

5. That this report is based on field notes of Mr. William James, P. Geol., sample examinations, and literature research.

6. That I have no interest, direct or indirect, nor do I expect to receive any interest, direct or indirect, in the subject property or in the securities of Frances Creek Mines Ltd.

[redacted]

Guy B. Allen, P. Geol.

[redacted]

Calgary, Alberta
January 28, 1975

A P P E N D I X 'A'

Sample Assays

To: FRANCES CREEK MINES LTD.,
#409, [redacted]-7th Ave. S.W.,
CALGARY, Alta.

File No. 9169
Date December 3, 1974
Samples Chip

Certificate of ASSAY

LORING LABORATORIES LTD.

SAMPLE No.	% Cu	% Pb	% Zn
5704-A (3-11-1)	.01	-	-
5705 (3-11-4)	-	-	.03
5706 (4-11-4)	.005	-	-
5707 (25-10-1)	.005	-	-
5708 (2-11-1)	.03	.04	.02

I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES . . . .

Rejects Retained one month.

Pulps Retained one month unless specific arrangements made in advance.

[redacted]

Licensed Assayer of British Columbia

A P P E N D I X 'B'

Rock Descriptions

Rock Type Number	Description
25-10-1	Appekunny Formation - Argillites, sandstones green to green-grey, minor white sandstone. Argillites are thin laminated to massive beds. One local occurrence of pyrite, trace, fine disseminated, some nodules to 1 cm. Mudcracks common. Outcrop patchy on ridge, more continuous in creek: Cu.- 0.005%,
25-10-2	Grinnell Formation - Red sandstone (siliceous, grading to quartzite) and argillites. Outcrop not continous. Minor white quartzitic sandstone, a few inches to a few feet thick. Minor green argillites. Sedimentary structures common - mudcracks, ripple marks, cut and fill, crossbeds, etc.
2-11-1	Appekunny or Grinnell argillites, 10 feet above and below andesite sill. Argillite is green-grey, thin laminated with interbedded siltstone which weathers light brown. Strike of bedding at 340°, dip 20°W. Minor red sandstone. Cu.-0.03%, Pb.-0.04%, Zn.-0.02%
2-11-2	Andesite sill, dark grey, 2 foot thick, weathers rusty with trace minor pyrite or chalcopyrite, tuffaceous.
2-11-3	Argillite, dark grey, dolomitic, massive with silty sandstone beds.
2-11-4	Dolomite, medium grey, generally cryptocrystalline siliceous algal forms on weathered surface.
2-11-5	Argillite, red with sandstone interbeds
3-11-1	Diorite sill, green-grey, fine to medium grained, fine to medium plagioclase laths and pink K-feldspars. Sample assayed taken from first outcrop going up creek - upper 15 feet exposed, upper 3 feet chilled, cryptocrystalline - uniform trace of fine pyrite and/or chalcopyrite. Cu.- 0.01%
3-11-2	Argillite, dolomitic, thin bedded to massive; with dolomite. Some sedimentary structures, mudcracks.
3-11-3	Dolomite, massive unit, resistant, dark grey, microcrystalline, local traces of very fine grained pyrite. Algal features on weathered surface. Overlain by grey dolomitic argillites.

Rock Type Number	Description
3-11-4	Dolomite - bed 5 feet thick, light grey to pink, weathers rusty brown. Trace sphalerite and pyrite. Local coarse zinc crystals. Zn.- 0.03%
3-11-5	Argillites - green, thin bedded recessive units alternate with massive quartzitic resistant units. Local minor trace pyrite
3-11-6	Argillites - red and green, and sandstones
3-11-7	Andesite - green, pillowed at lower contact, locally amygdaloidal.
3-11-8	Argillite - green, weathers brown.
4-11-1	Andesite - at falls on main creek level; well pillowed, resistant, trace pyrite
4-11-2	Dolomite - green, argillaceous, occasional red sandstone bed a few feet thick
4-11-3	Limestone - medium grey, massive, resistant,
4-11-4	Andesite - massive, locally coarse grained, locally amygdaloidal. Trace pyrite. Cu.- 0.005%
4-11-5	Dolomite - argillaceous

A P P E N D I X 'A'

Stream Sediment Sample Analyses

TP. 4

E

4-11-2

4-11-1

4-11-3

D

4-11-4

4-11-5

DRYWOOD MOUNTAIN

C

2-11-5

2-11-4

2-11-3

2-11-1

2-11-2

B

25-10-1

25-10-2

BOVIN LAKE

LOAF MOUNTAIN

T P. 3

A

3-11-1

3-11-2

3-11-3

3-11-4

3-11-5

3-11-6

3-11-7

3-11-8

NEWMAN PEAK

MOUNT GLENDOWAN

CLOUDY RIDGE

TP 2

LEGEND

- INTEREST AREAS
- 2-11-3 – ROCK TYPE (SEE ROCK DESCRIPTIONS)
- LITHOLOGIC BOUNDARY
- TRAVERSE

FIGURE NO. 1 1975 0002.

FRANCES CREEK MINES LTD.

SPIONKOP CREEK PROPERTY

SCALE: 4" = 1mi.

1974 PROSPECTING MAP

- TOWNSHIP BOUNDARY
- SECTION BOUNDARY
- PARK BOUNDARY
- QUARTZ MINERAL PERMIT BOUNDARY
- TRAILS & ROADS

WATERTON LAKES NATIONAL PARK

RI W5