MAR 19740007: BIGHORN

Received date: Dec 31, 1974

Public release date: Jan 01, 1976

K I N T L A E X P L O R A T I O N S L I M I T E D

GEOLOGICAL REPORT

1974 DIAMOND DRILLING PROGRAM

BIGHORN CLAIMS

YARROW CREEK - SPIONKOP CREEK

SOUTHWESTERN ALBERTA

EDMONTON, Alberta

September, 1974

E. Goble

CONTENTS:

INTRODUCTION

The Big Horn claim group consists of twelve quarter sections of land, the group being centered upon latitude 49^{0} 13' N and longitude 114^{0} W. The claim block lies to the NE of Mount Glendowan on an area between Yarrow and Spionkop Creeks. The claims have been held continuously since 1963 by the Goble Group Syndicate and their private company, the Frank-Lin Motel Co. Ltd., until they were acquired by Kintla Explorations Limited upon its incorporation in January of 1972. On the basis of property examination by Kintla geologists, assays and reports turned over to Kintla by Frank-Lin, and the recommendations of Prof. R.D. Morton, Kintla's consultant, a program of mapping, prospecting, and sampling was undertaken by Kintla during the springs of 1972 and 1973.

During the spring and early summer of 1974 a program of five shallow diamond drill holes was undertaken by Kintla. The diamond drilling was carried out with an AQ adapted Boyles Brothers XRT X-Ray diamond drill. Water supply was restricted to spring run-off from snow drifts and proved to be the deciding factor in hole location. The initial target area (DDH's 1 and 2) had to be abandoned when the runoff ceased, and the program had to be shifted to target 2.

The drilling was carried out by Frank Goble (previously a contract driller for Cominco Ltd. and presently Kintla's field manager). The core from DDH's 3,4, and 5 was split and sampled by Frank Goble and Erik Goble while the core from DDH's 1 and 2 was split and sampled by Malcolm Mawer, a geologist hired by Messrs. Erwin and Willi Zeiter for whom the drilling was being undertaken. Loring Laboraties Ltd. of 629 Beaverdam Road, Calgary, Alberta assayed all core samples from the property.

The purpose of this drill program was to outline sufficient ore of mineable grade to be classed as a small mine by the Alberta Departments of Lands and Forests and Mines and Minerals, i.e., a minimum tonnage of 100,000 tons of at least 1.5% copper. This report is a summary of that program.

PREVIOUS GEOLOGICAL WORK IN THE AREA

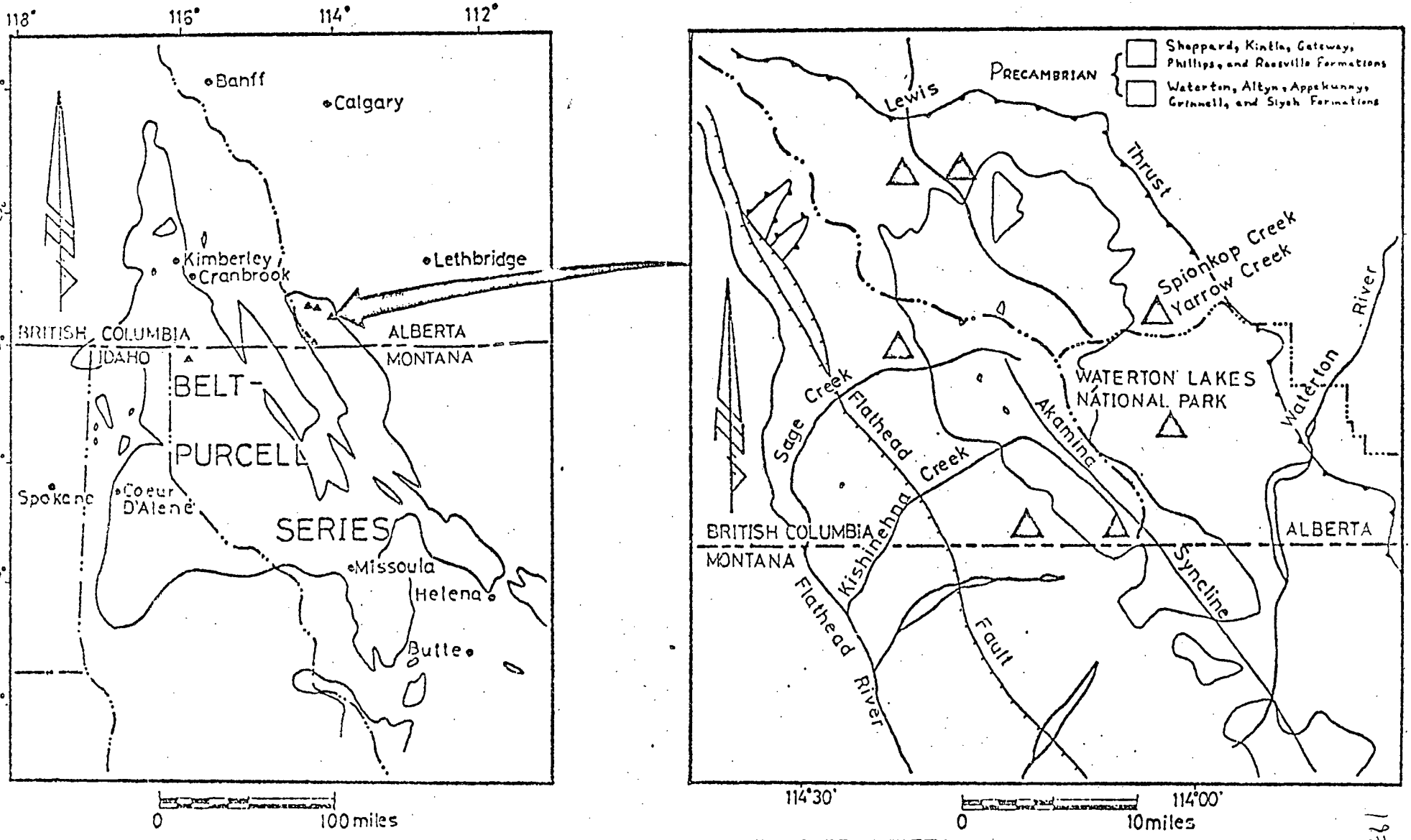
Reconnaissance geological studies of the area were carried out by Dawson (1886), Daly (1912), Hume (1932), and Clapp (1932). Fenton and Fenton (1937) studied the Lewis series in Waterton Lakes and Glacier National Parks and defined the Appekunny and Grinnell Formations. Douglas (1953) mapped the Waterton Lakes National Park area and Price (1962) mapped the Flathead map area. Hunt (1958, 1961) studied the intensive diabasic sills and the Purcell extrusives within the area. Stevenson (1968) prepared a detailed geological map of Yarrow Creek - Spionkop Creek district.

REGIONAL SETTING

The Big Horn claims are situated within the Clarke Range of the Rocky Mountains near the Canada - United States border. The area lies approximately fifteen miles north of the southwest corner of Alberta, between latitudes 49^{0} 12' N and 49^{0} 14' N, and between longitudes 113^{0} 59' W and 114^{0} 01' W (See Map 1). The area is moderately rugged with maximum relief of 2,500 feet. Access is good via gravel roads up Yarrow and Spionkop Creeks to the base of Spionkop Ridge, these roads being maintained year-round. A four-wheel drive road up Spionkop Ridge from Spionkop Creek is presently passable only during the period from June 1 to October 31. Winter access is restricted by an annual snow-fall of approximately 80 inches. Ridge tops and south facing slopes are generally accessible almost year-round. Power lines and gas pipelines parallel the gravel roads along Yarrow and Spionkop Creeks and continue to Shell Oil's sulfur plant at Pecten, some 6 miles to the northeast, the nearest location of a railroad. Regional access is excellent via Highways 2 and 3 to Pincher Creek, Alberta, some 18 miles north of the property, and Highway 5 from Pincher Creek to Waterton Park which passes some 8 miles east of the property.

GEOLOGICAL AND TECTONIC SETTING

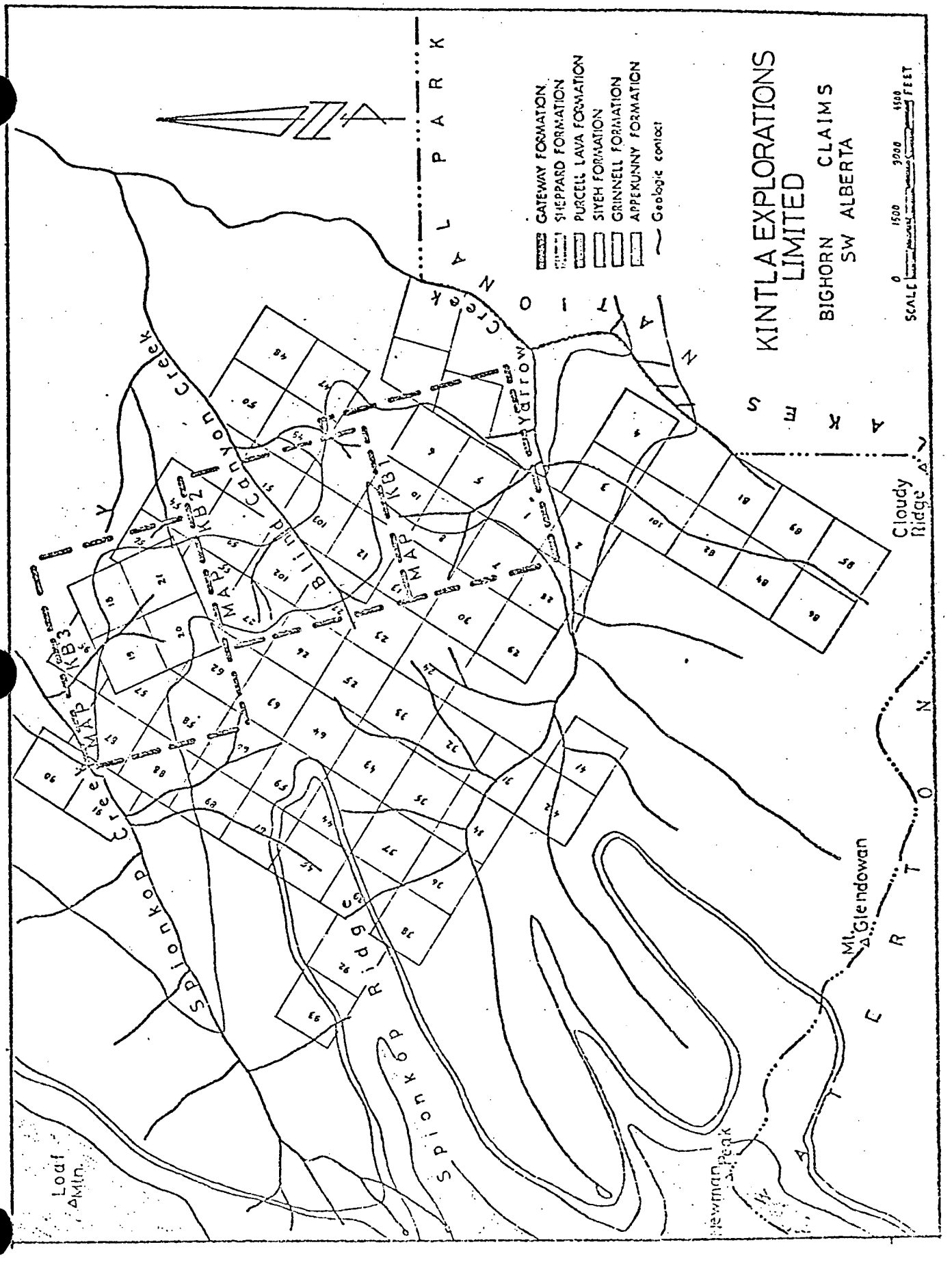
The Lewis series and its equivalent, the Purcell supergroup, is exposed in Canada south of latitude 51^{0} N in three major tectonic units, the Purcell arch, the Western Rocky Mountain fault complex, and the Lewis thrust plate (Burwash, 1968). The Lewis series outcrops within the Lewis thrust plate which is a sheet of gently folded almost horizontal Precambrian strata which has been thrust over Paleozoic and Mesozoic formations. It is folded into a series of en-echelon structures which trend south to southeast. Bostock et al. (1959) conclude that the most dominant of the folds, the Akamina syncline, parallels the Purcell anticlinorium, forming most of the Rocky



Map 1: Geological end location map of Lewis Thrust Sheet (after Price, 1965).

△ KNOWN CU OCCURRENCES IN BELT-PURCELL SERIES

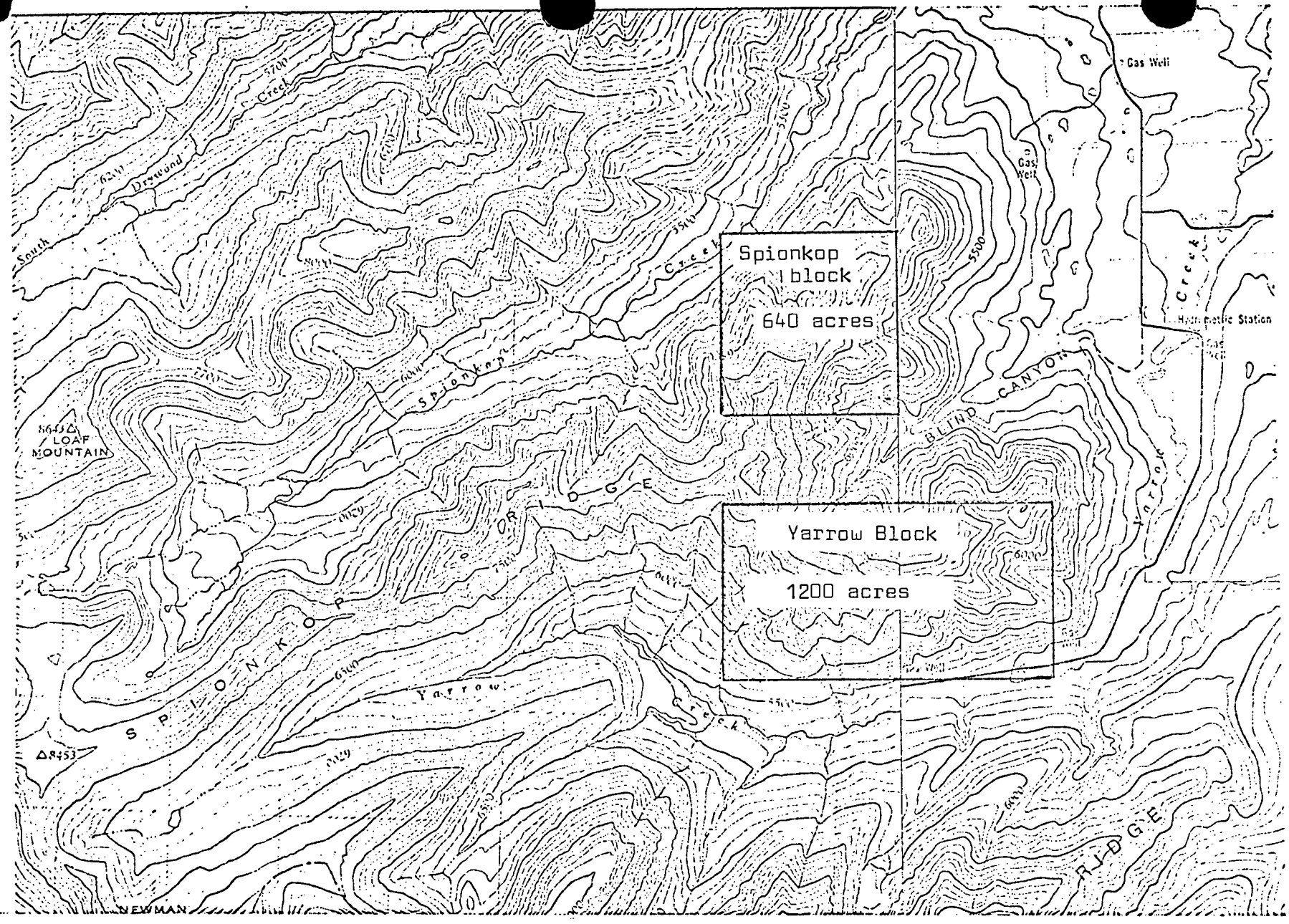
1974



Map 2: Geological and claim map of Bighorn Claims (after Goble and Morton, 1971).

ERA	PERIOD OR EPOCH	GROUP FORMATION	LITHOLOGY	THICKNESS (feet)
		EROSIONAL UNCONFORMITY		
PRECAMBRIAN	PURCELL	MOYIE INTRUSIONS	Diorite sills and dykes	
	PURCELL (LEWIS)	GATEWAY KINTLA: ROOSVILLE FORMATION	Green argillite, siltstone, sandstone, stromatolitic dolomite	3500±
		GATEWAY KINTLA: PHILLIPS FORMATION	Red sandstone, siltstone, argillite	500- 700
		GATEWAY KINTLA: GATEWAY FORMATION (upper member)	Argillite, argillaceous siltstone, dolomite dolomitic sandstone, and argillite	1150-3000
		GATEWAY KINTLA: SHEPPARD FORMATION	Quartzitic & dolomitic sandstone, dolomite, oolitic dolomite, argillite, siltstone, pillowed andesite	150- 900
		EROSIONAL UNCONFORMITY IN PART		
		PURCELL LAVA	Chloritized andesite, & amygdaloidal andesite, pillowed andesite	00- 600
		SIYEH FORMATION	Limestone, dolomite, argillite & sandy limestone & dolomite, argillite, stromatolitic limestone	1130-3000
		GRINNELL FORMATION	Red argillite, sandstone & siltstone; white, green & red quartzite	350-1700
		APPEKUNNY FORMATION	Green argillite; white, grey & green quartzite; sandy argillaceous dolomite & dolomitic argillite; siltstone	1500-2000
		ALTYN FORMATION	Argillaceous limestone & dolomite; sandy dolomite, argillite, & stromatolitic dolomite	500-4000
		WATERTON FORMATION	Limestone & dolomite, argillite, & argillaceous dolomite	1500+

Map 3: Stratigraphic succession of SW Canadian Precambrian (after Price, 1962).



BIG HORN CLAIMS

KINTLA EXPLORATIONS LTD.

MAP 4

1994007

Mountain Trench. Mume (1932) concludes that this warping occurred subsequent to the movement along the Lewis Thrust.

The Lewis thrust sheet is cut to the west by the Flathead fault, one of a set of normal faults formed subsequent to the thrusting. Bally et al. (1966) believe that this is a listric normal fault formed after emplacement of the Lewis overthrust by 'back-slippage' along a pre-existing thrust during a post-orogenic uplifting. Jones (1969) classifies the thrusting and subsequent normal faulting as part of the Laramide orogeny of the Middle Paleocene and Eocene. Movement of the Flathead fault is believed to have continued well into the Oligocene.

Regional metamorphism within the Lewis thrust sheet is of low grade. Leach (1962) found that in the western Rockies this metamorphism was near the transition from the quartz-albite-epidote-biotite subfacies to the quartz-albite-epidote-almandine subfacies. This metamorphism occurred during the East Kootenay orogeny at approximately 750 million years ago (Burwash et al., 1965).

The Precambrian Appekunny, Grinnell, Siyeh, Purcell Lava, and Sheppard formations as mapped by Price (1962), outcrop on the Big Horn claims (Map 2). For the most part these consist of quartzites, argillites, and carbonates, with minor intercalated submarine lavas (Map 3). Ressor (1957) and Price (1964) postulated that the Lewis series sediments, of which these are a part, were deposited in the shallow waters of a deltaic basin and were in part of subaerial origin. Smith and Barnes (1966) recognize cyclic deep-shallow water depositional phases in the Montana equivalents of the Lewis series. One such cycle terminates at the base of the Siyeh Formation, with the Appekunny and Grinnell formations representing the shallow water half of the cycle. Waldron (1942) points out that the Appekunny and Grinnell formations may be differently coloured phases of one formation, with the line of distinction between them being one oblique to the stratification.

The sediments have been intruded by a series of amygdaloidal porphyritic quartz-diabase sills and dykes up to 100 feet thick. These are of Precambrian age and possible contemporaneous with the extrusion of the Purcell lavas (1130 $\pm$ 20 m.y.).

The Precambrian rocks in this area are present as part of the Lewis thrust sheet, in which Precambrian sediments have been thrust from the southwest over the younger Paleozoic and Mesozoic sediments. According to Price (1962), the thrust sheet is characterized by a series of thrust faults and associated folds, cut by younger SE- or W- dipping normal faults. Price (1967) also describes a series of NE-trending transverse faults found within the Clarke Range.

METALIFEROUS DEPOSITS

Dawson (1886) first reported the occurrence of copper in the North Kootenay Pass region of the Lewis thrust sheet in the form of chalcopyrite within the Purcell lavas and diabasic dykes. Ross (1959) noted exploration activity within Glacier National Park around 1890 centered on copper-lead-silver ore near the heads of Quartz and Mineral Creeks (within the Grinnell and Siyeh Formations). He also reported the staking of some one hundred claims in 1898 on two parallel chalcopyrite veins associated with intrusive metagabbro dykes. During the first decade of the 20th century, small scale mining was also undertaken within Waterton Lakes and Glacier National Parks. This was centered on two copper-bearing diabase dykes within the Grinnell Formation on Blakiston Brook in Waterton Lakes National Park, and on a gold deposit in the Waterton Formation on Chief Mountain in Glacier National Park.

Outcrops of cupriferous quartzite in the Yarrow Creek area were initially staked during this period, but the claims were never recorded. Interest in the area lapsed until 1963 when Erik and Frank Goble staked the first 10 of 75 Big Horn claims. Kennco Explorations Limited examined the property in 1967, during which time mapping and prospecting outlined a possible 1,000,000 tons of up to 3.5% copper ore in a diabase sill on Spionkop Ridge.

OUTLINE OF THE 1972-73 (SPRING) PROGRAM

In May 1972 a program of mapping prospecting and sampling was undertaken by Kintla on the Big Horn claims. The purpose of the program was to duplicate the pre-1972 samples, to take additional samples from the same mineralized beds between the primary sampling sites, and to map and correlate the sections. The main targets were:

1) A 5-8 foot thick bornite-covellite-chalcocite mineralized quartzite bed continuous along strike from just north of Yarrow Creek, through the Blind Canyon to just south of Spionkop Creek, approximately 3 miles, with copper values of from 1 to 2.5%.

2) A 12-30 foot thick diorite sill with a 3-8 foot chilled margin, described by R.W. Stevenson as containing from 1.83 to 3.45% copper and with up to 0.86 ounces silver per ton.

3) A high silver showing on Yarrow Creek near the south end of the quartzite bed mentioned in (1), which assayed at 59.38 ounces silver per ton and 3.7% copper; and a 2.22 ounces silver per ton showing in the apparently unmineralized central portion of the main diorite sill where it crosses Yarrow Creek.

4) An area of old trenches where faulting has apparently pushed mineralized Appekunny strata into the lower Grinnell formation.

5) An area of high bornite-covellite assays, approximately 1,000 feet by 300 feet, covering roughly 200 feet of section in the upper Grinnell north of Yarrow Creek, of which one (the lowest quartzite) is the southern end of the bed described in (1).

6) The numerous 6-10 foot thick diorite dykes and sills north of Yarrow Creek which carry desseminated chalcopyrite and/or bornite and chalcocite.

One geologist, one prospector, three full-time and two part-time assistants were employed mapping, prospecting and sampling an area of about 2,000 acres covering the Grinnell, and parts of the Siyeh and Appekunny Formations. The program was carried out between times of preparation of the field camp on the Commerce Mountain gold-silver-copper property.

Mapping was carried out on a scale of one inch to two hundred feet with control by chain and compass. A two

hundred foot interval grid with two hundred foot stations was used on the main showings and a four hundred foot interval grid with two hundred foot stations was used on areas of lesser interest. Elevations of stations were determined using an altimeter having a precision of approximately 10 feet, and which was adjusted daily to the first base line peg (yo peg) having an assumed elevation of 5130 feet (based on the first day reading with the altimeter set at 4200 feet at the Waterton townsite).

The results of the field work are summarized below.

RESULTS

Mapping on the Big Horn claims was confined to the Grinnell formation except in areas where prospecting revealed mineralized horizons in the Appekunny or Siyeh formations. Maps KB-1, KB-2, KB-3 (Kintla-Big Horn-No. 1, 2, 3,) show local geology and sample locations and values for the Yarrow Creek, Blind Canyon, and Spionkop Creek map areas respectively.

YARROW CREEK

Geology-

The stratigraphic succession in the Yarrow Creek map area is Appekunny formation, Grinnell formation, and Siyeh formation, moving upwards. The Appekunny formation consists of dominantly green and white argillites and quartzites, grading over a short interval into the dominantly red argillites of the lower Grinnell. Reddish quartzites and minor white and greenish quartzites become more prevalent in the upper Grinnell formation and grade into the black shales and buff quartzites of the lower Siyeh. These in turn give way to the carbonates which make up the bulk of the Siyeh Formation.

The sediments strike approximately N 140° E and dip at approximately 25° SW. Numerous diabase sills and dykes intrude

the sediments, the most prominent being a large sill (up to 100 feet thick) which is found approximately 20 feet below the top of the Appekunny formation throughout the Yarrow Creek map area. A concentration of sills and dykes lies in the upper Grinnel in the Yarrow-Main zone.

The sediments in the Yarrow Creek map area are cut by numerous reverse faults striking N 10^{o} W to N 60^{o} W and dipping from 70^{o} to 90^{o} SW. A few thrust faults striking approximately N 45^{o} E and dipping from 15^{o} to 25^{o} SE are also present. Stevenson (1968) noted that some faults cut the lower Grinnell but not the diabase sill in the upper Appekunny, and concluded from this that some of the faulting was caused by the intrusion of this diabase sill into the incompetent sediments. Some of the faults cut the sills and dykes while other fault zones are occupied by dykes, indicating that at least some of the faulting was post-intrusive.

Mineralization-

The mineralization in the Yarrow Creek map area consists of copper-silver and minor lead mineralization of quartzites, sandstones, and intrusives, all within the Grinnell formation, and one limited exposure of Appekunny qyartz sandstones. Mineralization is in the form of covellite, anilite, bornite, and rarely chalcopyrite, disseminated in quartzites and in the chilled margins of the diabase sills and dykes. Bornite and covellite are frequently present as veinlets within argillite pebbles found throughout the quartzite beds.

The diabase sills and dykes intrude the fault planes of SW- or W- dipping normal or reverse faults. A major overthrust of the upper Grinnell over the base of the Siyeh occurs in the northern part of the Main zone.

The Yarrow Creek area consists of four areas of interest as follows:

1) Quartzite unit 19:

This unit has been traced from 22+00 feet N, 1+00 feet W to 62+00 feet N, 26+00 feet W, with representative assays (from S to N) of:

1- 1.01% Cu, 0.15 oz Ag, 9'.
2- 0.38% Cu, 0.02 oz Ag, 9'.
3- Several assays of mineralized blocks of unit 19 quartzite float on the south side of the outcrop of the ridge from 22+00 feet N, 1+00 W to 22+00 N., 10+00 E; averaging 2.5% copper.
4- Several blocks of mineralized quartzite of unit 19 as float on the SW outcrop of the unit, from 22+00 N and 10+00 E to 34+00 N and 11+00 E; averagine 1.8 to 3.2% copper.
5- 1.33% Cu, 0.16 oz Ag, 5' thickness.
6- 1.82% Cu, 0.18 oz Ag, 6' thickness.
7- 3.60% Cu, 0.60 oz Ag, 1' top of bed only.
8- 1.94% Cu, 0.26 oz Ag, minimum of 3.5'width.
9- 1.49% Cu, 0.27 oz Ag, minimum 8', may be overlying bed.
10- 2.50% Cu, 0.45 oz Ag, minimum 4'.
11- 6.70% Cu, - Ag, top 18" of bed.
12- 3.38% Cu, 1.20 oz Ag, 8'.
13- 1.66% Cu, 0.51 oz Ag, 6'.
14- 0.81% Cu, 0.03 oz Ag, 6'base of bed.
15- 1.76% Cu, 0.24 oz Ag, 7' (on map KB-2).

These samples represent a block of quartzite some 4,000 feet in lenth (north to south), and 2,000 feet in breadth (east to west). The best exposed portion of this block is 2,000 feet by 1,400 feet with an average thickness of 8 feet, and consists of the first 14 above assays, comprising a potential 2.4 million tons of 2.0 to 2.25 % copper and 0.15 to 0.25 oz Ag in that portion of the larger block. The larger block contains a potential 4.0 million tons of similar grade ore, even without allowing for extensions north or south, or down dip beyond that portion directly between the northernmost and southernmost assay points. The quartzite extends beyond these points, and is mineralized at up to 1.36% copper, but contains a barren zone of 0.05 to 0.10 % copper some 500 to 1,500 feet north of the 1.76 % Cu assay point.

This major drill target and several minor targets in the Yarrow Creek area are outlined in red on map K8-1. The minor drill targets are small tonnage - high grade showings which would warrant further work only if a major program was undertaken on the above quartzite unit. Low-grade mineralization has also been noted within the Appekunny Formation quartzites. Grade runs from 0.1 to 0.3 % Cu across 30-40 feet, and apparently represent leached values of the much richer Appekunny quartzites and sandstones which have been pushed through the lower Grinnell formation along a major wrench fault. These rocks are exposed at the "trenches", old pits dug by the original stakers in the early years of the twentieth century, located at 13+00 N and 2+00 E. The Appekunny quartzites at the "trench" assay at between 1.0 and 3.5 % copper, with most of the copper present as malachite, although a few of the larger blocks of quartzite contain bands of bornite-covellite 8-12 inches in length and 1/3 to 1/2 inch in thickness. This occurrence is close to the center of the intrusives cutting through the large poorly mineralized diabase sill at the top of the Appekunny, and may represent mineralization emplaced as a result of the impoundment of the intrusives below the large sill.

YL ZONE

The YL zone is an exposure of galena bearing lower Siyeh carbonates northwest of the main zone. The mineralization is in the form of disseminated galena and fracture-filling galena in an extensive shatter zone above a galena bearing diabase dyke. Minor veins of galena, chalcopyrite, and sphalerite occur above the main mineralized area, and are apparently related to it. A northwesterly trending fault extends through the zone and may connect with a similar northwesterly trending fault cutting through the copper zone to the southeast. Minor lead mineralization also occurs 1,300 feet southeast of the main lead zone alongside the fault mentioned above. This is in the form of

disseminated galena within the lower Siyeh limestones and mudstones. Assays are as follows:

1- 4.96 % Pb, 0.12 oz Ag, 10'.
2- 57.35 % Pb, 2.35 oz Ag, 4'.
3- 52.20 % Pb, 5.25 oz Ag, 4'.
4- 3.38 % Pb, 0.24 oz Ag, 5'.
5- 0.62 % Pb, 0.48 % Zn, 1' vein.
6- 0.14 % Pb, 0.07 % Zn, 1' vein.

SPIONKOP CREEK

The stratigraphic succession in the Spionkop Creek map area is, as in the Yarrow Creek map area, Appekunny formation, Grinnell formation, and Siyeh formation. The sediments are similar, although in the Spionkop Creek area there is a noticeable scarcity of muc cracks within the Grinnell sediments as compared to the Grinnell sedements in the Yarrow Creek area.

The sediments strike approximately N 140^{0} E and dip at approximately 20^{0} SW. The large diabase sill found near the top of the Appekunny formation in the Yarrow Creek map area is again present in the south-east and north-west sectors of the map area, but in the area north of 114+00 feet north, the sill transgresses up through the Grinnell formation as a dyke, splits, and outcrops within the upper Grinnell as a series of cupriferous diabase dykes. One or more of these outcrops may represent faulted segments of the same dyke, but there is evidence for at least 5 separate cupriferous dykes. Other minor copper bearing sills and dykes outcrop in this same area.

The sediments in the Spionkop Creek map area are cut by numerous reverse faults striking from N 10^{0} W to N 90^{0} W and dipping from 70^{0} to 90^{0} SW. A faulted repeat of the Grinnell formation containing mineralized diabase dykes occurs to the north-east of the main intrusive zone. The large diabase sill recurs twice to the northwest some 3,200 and 5,600 feet respectively, and is mineralized in both instances.

Representative assays are as follows:

1- 0.68 % Cu, 6' sample.
2- 0.50 % Cu, 6'
3- 0.38 % Cu, 4'
4- 0.80 % Cu, 6'
5- 1.50 % Cu, 3'
6- 2.84 % Cu, 0.79 oz Ag, 8'
7- 3.23 % Cu, 1.10 oz Ag, 3'
8- 1.35 % Cu, 0.30 oz Ag, 8'
9- 3.04 % Cu, 0.83 oz Ag, 8'
10- 1.86 % Cu, 0.28 oz Ag, 12'
11- 6.38 % Cu, 0.62 oz Ag, 3'
12- 1.54 % Cu, 0.09 oz Ag, 7'
13- 4.60 % Cu, 0.09 oz Ag, 11'
14- 2.47 % Cu, 0.95 oz Ag, 8'
15- 0.02 % Cu, tr Ag, 4 foot base of sill
16- 2.21 % Cu, 0.28 oz Ag, 3.5'
17- 2.22 % Cu, 0.37 oz Ag, 6.5'
18- 2.84 % Cu, 0.41 oz Ag, 10'
19- 1.90 % Cu, 0.18 oz Ag, 6.5'
20- 2.80 % Cu, 0.42 oz Ag, 8'
21- 2.65 % Cu, 0.03 oz Ag, 8'
22- 0.02 % Cu, tr Ag, 6' (small barren sill)
23- 0.53 % Cu, 0.11 oz Ag, 3.5'

The continuation of the intrusive 3,200 feet to the west assays at:

1- 1.11 % Cu, 0.26 oz Ag, 16'
2- 1.50 % Cu, 0.30 oz Ag, 15'
3- 0.80 % Cu, 0.10 oz Ag, 6'

The continuation of the intrusive 5,600 feet west of the main intrusive zone assays at:

1- 0.76 % Cu, 0.35 oz Ag, 5' sample, upper contact.
2- 0.38 % Cu, 0.05 oz Ag, 3.5' sample, lower contact.

The faulted extension of the main intrusive zone occurring 1,200 feet east contains disseminated chalcopyrite

and bornite assaying 0.75 to 1.0 % copper across 5-8 foot widths.

The quartzites overlying the intrusives, units 8 and 13 are also shown on the map. Unit 8 is exposed for only 600 feet south and 400 feet west of its initial outcrop point directly above the main intrusive area, and assays at 1.85 % copper and 0.04 oz Ag across 4'. Unit 13 outcrops for 1200 feet west and from 122+00 N and 3+00 W to 95+00 N and 15+00 W. Representative assays from this bed are:

1- 1.34 % Cu, 8', southern portion.
2- 1.75 % Cu, 4' minimum thickness.
3- 1.94 % Cu, 0.18 oz Ag, 6.5'
4- 0.66 % Cu, 0.04 oz Ag, 6.5'
5- 1.27 % Cu, 0.16 oz Ag, 8'
6- 1.26 % Cu, 0.11 oz Ag, 8'

The area represents the greatest potential of the property, with a quartzite unit some 3,200 feet in strike length exposed along its dip for 1,200 feet averaging over 1.35 % Cu and 0.1 oz Ag across 6-8' widths combined with the consistently mineralized intrusives just below the quartzites in the section. The intrusives are the most widely mineralized, being 3,600 feet along the southeastern outcrop and 5,600 feet along the northwestern outcrop with thicknesses of from 6 to 16 feet. A triangle based on these dimensions would contain in excess of 14 million tons, with an apparent average grade of 1.9 % Cu and 0.25 oz Ag. However, this apparent grade must be reduced due to the large number of assays from the main intrusive zone, and 1.5 % Cu and 0.25 oz Ag per ton would be more representative.

The copper mineralization in the Spionkop Ridge area is zoned around the main intrusive zone, with a decrease in rank of copper minerals to the south and west, from bornite-covellite in the center, through bornite, bornite-chalcopyrite, chalcopyrite, and finally to chalcopyrite-pyrite assemblages 4,000 to 6,000 feet away (to the south and west respectively).

The bornite - covellite bearing central portion of this intrusive zone represents a potential of 1.2 to 2.4 million tons of ore mineralized at well in excess of 2% copper and with up to 0.86 ounces of silver per ton.

1974 ACTIVITY

Surface mapping and sampling on the Big Horn claim group has outlined three probable orebodies containing an estimated 2.4 to 10.5 million tons of 1¼ to 2½ % copper, 0.1 to 0.25 oz/Ton silver at open pittable depths.

A series of five shallow diamond drill holes was carried out on the property during the spring of 1974, the primary target being a 1500 foot long section of mineralized quartzite some 10 - 12 feet thick. This represents the northern portion of the Yarrow Creek zone of approximately 4 miles of mineralized quartzite.

In this locality the quartzite is exposed on surface for down dip extensions of up to 350 feet wide. The drill program was planned to investigate the continuation of the mineralization below the surface exposure. As the mineralized layer approximately parallels the ground surface in the drill area there are excellent open pit possibilities.

Drill holes 1 and 2 were located on the eastern-most exposure of the mineralized bed and returned core mineralized at an extimated 1.25 - 1.5 % Cu for DDH-1 and 1.5 - 2.0 % Cu for DDH-2. However, improper sampling of the cores gave unrepresentative low assay results of:

DDH # 1 - 0.19 % Cu, tr. oz Ag/Ton

DDH # 2 - 1.01 % Cu, 0.34 oz Ag/Ton

These drill holes will be repeated when a water supply is available on the drill sites. Surface sampling of the bed shows that quartzite unit # 19 carries 1.82 % Cu and 0.18 oz Ag/Ton in that locality.

Drill holes 3,4, and 5 are located in a single block as outlined on maps 5 and 6 showing the drill hole locations, outcrop

of the quartzite, and tentatively outlined blocks of ore. The core from drill holes 3,4, and 5 were only slightly richer than that from DDH's 1 and 2, but as these were properly split and sampled, the results were representative. The results are:

	% Cu	oz/Ton Ag	footage
DDH # 3 -	1.29	0.72	2-5 feet
	2.43	0.44	5-12 feet
average -	2.09	0.52	10 feet
DDH # 4 -	1.09	0.40	2 feet
	0.95	0.34	4 feet
average -	0.99	0.36	6 feet
NOTE - last 3.4 feet of core ground up (richest)			
DDH # 5 -	2.48	0.82	7 feet
	2.03	0.72	3 feet
average -	2.35	0.79	10 feet

as indicated on maps 5 and 6.

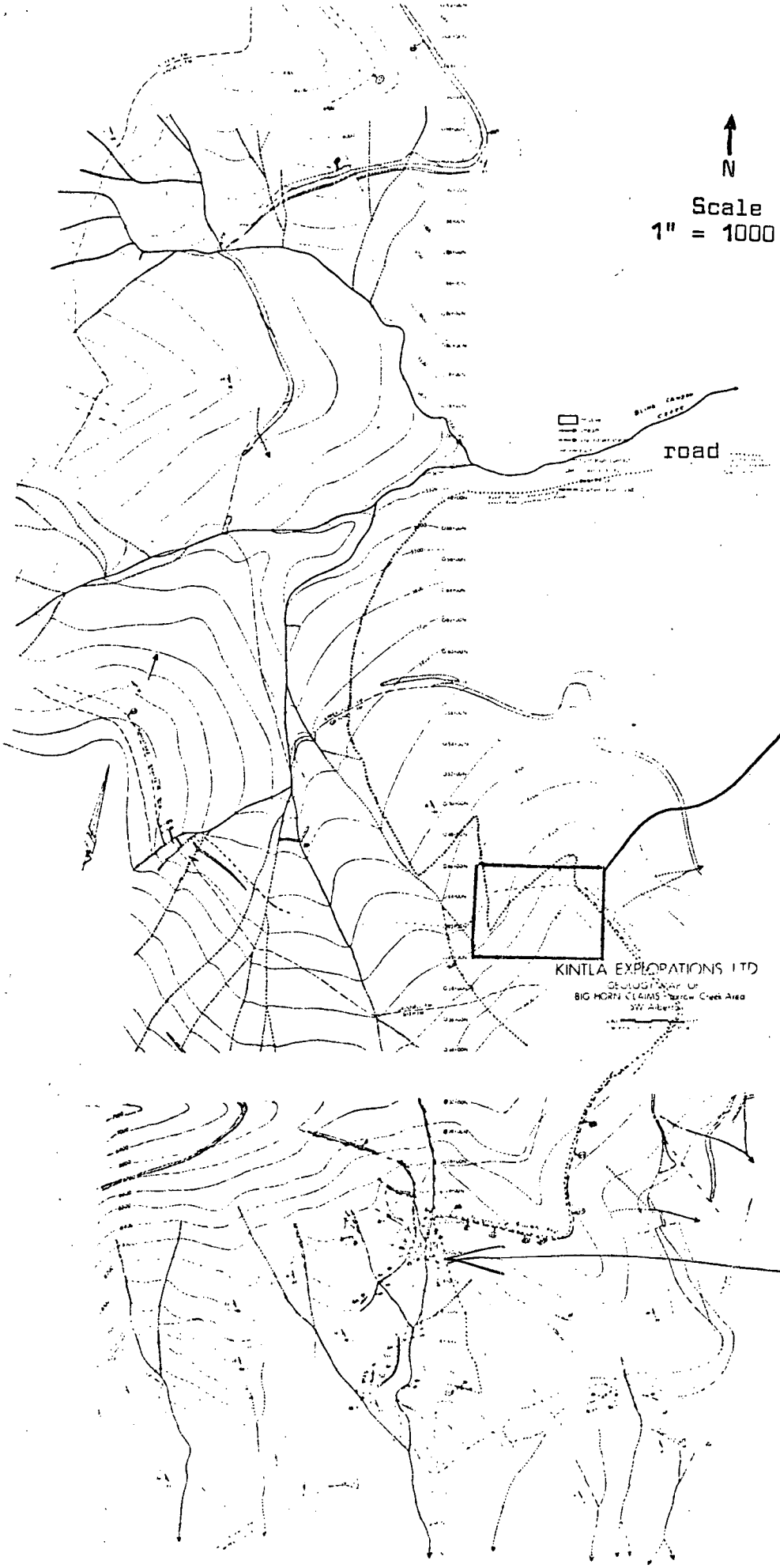
This final series of holes blocks out approximately 240,000 tons of an average of 1.97 % Cu and 0.62 oz Ag/Ton over 10 feet.

The mineralization extends well beyond this small area as can be seen on map 5. The drilled off strike length represents only 1/30th of the known strike length of the quartzite unit with the mineralization known to extend laterally from this location. At approximately 1400 feet west of the drill area the unit assays at 1.76 % Cu, 0.24 oz Ag across 7 feet; at 800 feet southeast it assays 1.33 % Cu, 0.16 oz Ag to 1.82 % Cu, 0.18 oz Ag across 5 to 6 feet; and at 1000 feet south the unit is 1.20 % Cu, 0.72 oz Ag to 1.84 % Cu and 0.48 oz Ag per ton.

CONCLUSION

The Big Horn property contains excellent potential for the development of major ore bodies in both the Yarrow Creek area quartzites of the upper Grinnell formation and in the Spionkop Creek - Spionkop Ridge area of quartzites and diabase intrusives. If continued

1974-0007



KINTLA EXPLORATIONS LTD.

Map 5

1974/0007

MAP 6

KINTLA EXPLORATIONS LIMITED

Tonnages:

Block 1 - $\frac{150' \times 500' \times 10'}{10'}$ = 75,000 tons

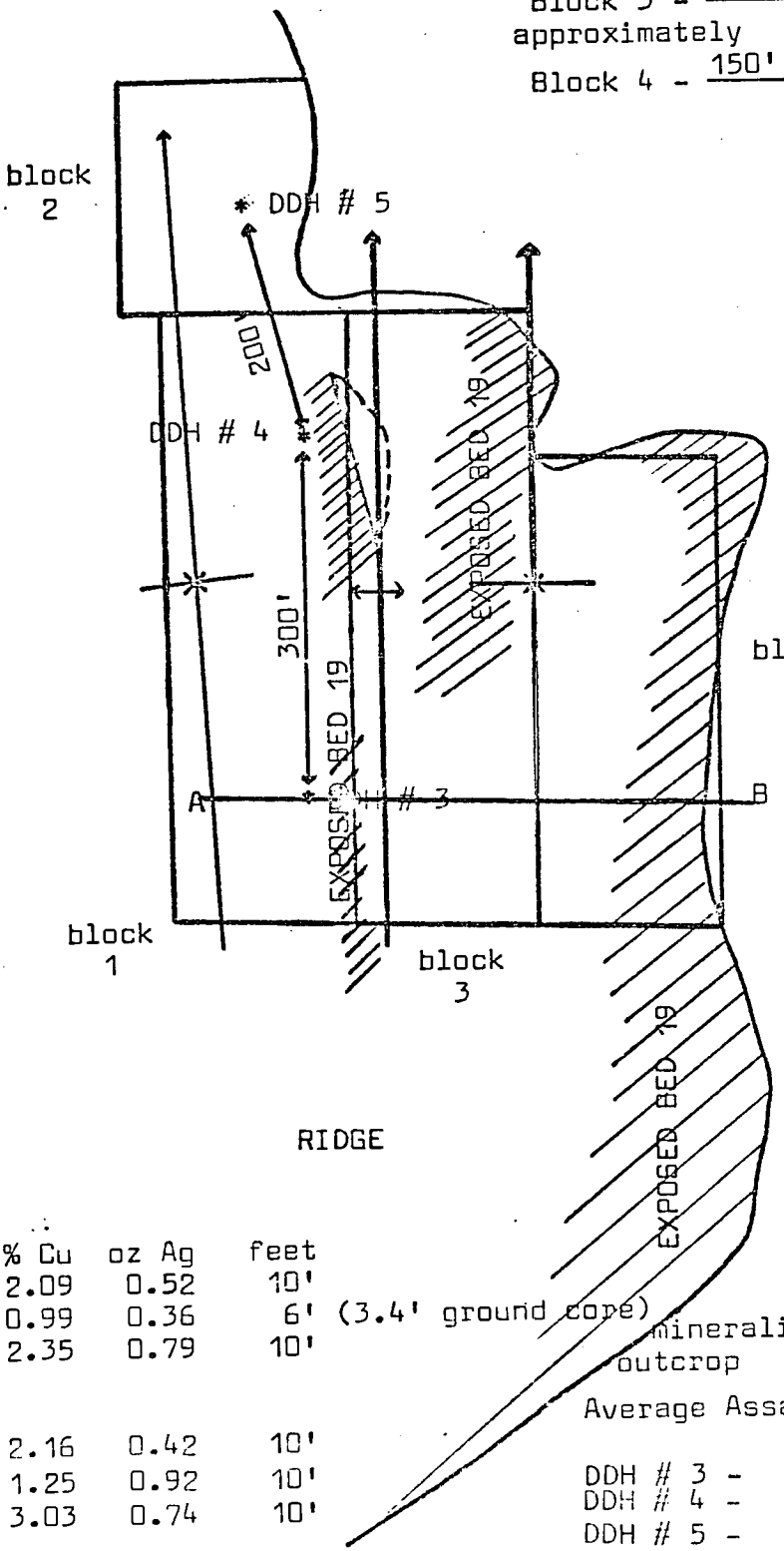
Block 2 - $\frac{190' \times 150' \times 10'}{10'}$ = 28,500 tons

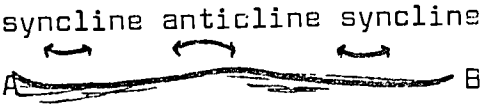
Block 3 - $\frac{150' \times 500' \times 10'}{10'}$ = 75,000 tons

approximately

Block 4 - $\frac{150' \times 500' \times 10'}{10'}$ = 60,000 tons

Total 238,500 tons





Note: The Plane of the bed is plunging westerly at about 25°, the folds at about 20°.

Also note: this map is in the plane of the bed.

N

Scale: 1" = 100'

Assays:

	% Cu	oz Ag	feet
DDH # 3 -	2.09	0.52	10'
DDH # 4 -	0.99	0.36	6' (3.4' ground core)
DDH # 5 -	2.35	0.79	10'

Surface:

DDH # 3 -	2.16	0.42	10'
DDH # 4 -	1.25	0.92	10'
DDH # 5 -	3.03	0.74	10'

mineralized outcrop

Average Assays:

	% Cu	oz Ag	feet
DDH # 3 -	2.13	0.47	10'
DDH # 4 -	1.10	0.65	10'
DDH # 5 -	2.69	0.76	10'

Total Average:
2.0 % Cu
0.62 oz Ag
across 10'

exploration can prove the ore to be continuous at depth to the base-lines of triangles defined by the outcrop, 17 to 20 million tons of ore grading at 1.25 to 1.75 % copper and 0.2 to 0.3 oz silver per ton would be proven up.

The excellent lateral extensions of thes outcrops combined with their syngenetic occurrence suggest that the ore should extend underground well beyond the quarter million tons of approximately 2 % copper ore proven up in this program. In fact, minor prospecting while establishing the drill sites showed that there are at least 3 and perhaps as many as 6 quartzite beds mineralized at from 1 to 3 % copper which total from 30 to 40 feet of thickness lying within an estimated 60 to 70 feet of section in the Grinnell formation. These additional beds would obviously be mined as well as the principle bed, unit 19, greatly increasing the mineable tonnage.

The next stage in the development of this property should be the carrying out of additional diamond drilling laterally and down dip from the locations of DDH's 3,4 and 5, with the trenching and road-building required by a diamond drill program of some 1500 to 2000 feet of drilling. However, the various departments of the Alberta government which must give permission for such a program have indicated that road-building and trenching can only proceed under the authority of a mining permit, and that application for the construction and operation of an open pit mine must be made. This then is the next step to be undertaken: a comprehensive report compiled by a mining engineer, a geologist, and an ecologist must be prepared meeting the requirements of the relevant Alberta Acts and submitted to the government. If the application is refused the government has indicated that it will reimburse all costs related to the property since its staking in 1963, and also will pay compensation for the ore for which permission is refused to mine. If the application is approved then any and all trenching, road construction and drilling can be undertaken immediately.

CERTIFICATE

I, E.O. Goble, of the City of Edmonton, in the Province of Alberta, hereby certify that, with the exception of the assaying and the splitting and sampling of the cores of diamond drill holes one and two, this diamond drill program was carried out under my general supervision as president of and geologist for Kintla Explorations Limited, the present holders of the Big Horn Group of Claims, and that the results described above are correct.

Dated at Edmonton, Alberta, this 23rd day of September, 1974.

E. Goble, geologist
Kintla Explorations Limited
Edmonton, Alberta