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REPORT ON THE ELKHORN MINING DISTRICT
Jefferson County, Montana

J.K. Jones September 26, 1974

INTRODUCTION

The Elkhorn Mining District, located in Jefferson County, Montana, approximately 48 miles by road south of the state capitol at Helena, was proposed as a porphyry copper exploration target by R.E. Holt. Maps and reports in possession of Siskon Corporation of Reno, Nevada, were reviewed by J.K. Jones on August 30, 1974 and summarized in a brief report. The Siskon information described some geologic features associated with porphyry copper deposits and justified further consideration of the district. Five days, from September 13 to 17, 1974, were spent by Jones examining surface exposures and drill core on the ground.

PHYSICAL FEATURES

The townsite of Elkhorn is situated on Elkhorn Creek, a tributary of the Boulder River, in Township 5 and 6 North, Range 3 West, at an elevation of 6500 feet. Moderate to steeply sloping mountains surrounding the old townsite are soil-covered with few rock exposures, and support a thick growth of pine, fir, and spruce. Patented mining claims cover the central portion of the district, but the adjacent ground is managed by the U.S. Forest Service, and the new regulations on land use in the National Forest will be a factor in any exploration activity.

Because of the location and elevation of the area, snowfall and cold weather are an important factor in scheduling exploration activity. Surface geologic work and sampling probably are restricted to the period May through October in most years. Heavy snows and extremely cold weather normally would not be expected before December, however. Drilling can be conducted during the winter months, but this incurs considerably increased costs and loss of efficiency. The nearest town for which weather data is available is Boulder which is located 20 miles to the west via 12 miles of improved dirt road and 8 miles of paved road. Boulder records slightly less precipitation and slightly warmer winter temperatures than do Butte and Helena.

HISTORY

Production previously reported covered the period 1902 to 1957. Additional data has been found on production prior to 1901 which is nearly equal to that after 1901. The following table lists total recorded production from the district.

Gold (ounces)	Silver (ounces)	Lead (pounds)	Zinc (pounds)	Copper (pounds)
70,015	14,982,751	16,608,000	6,162,000	766,000

At present metal prices this production would have a gross value in excess of $76,000,000. Mining started in the district in about 1875, and the townsite contains numerous old buildings that are now a tourist attraction. Future mining operations may have to preserve the townsite.

Siskon Corporation purchased several patented mining claims prior to World War II, then in recent years expanded their property position to include 8 patented and 84 unpatented mining claims. An I.P. survey was completed and geologic mapping undertaken in an attempt to define a porphyry copper target. In late 1973 and early 1974 U.S. Borax drilled two core holes 975 and 690 feet deep to test at relatively shallow depth below a surface exposure of weak molybdenum mineralization.

TERMS

Siskon Corporation has indicated a desire to option their group of 92 mining claims for a down payment of $2500, with monthly payments starting at $250 the first year and doubling each year thereafter. At the end of the fifth year an end price of $1,500,000 would fall due, and a 2% net smelter royalty would be retained by Siskon.

GEOLOGY

The Elkhorn District is in a belt of complexly intruded sedimentary rocks along the crest and east limb of a north-plunging anticline. The west limb of the anticline has been engulfed by the Boulder batholith, a body of intrusive quartz monzonite approximately 80 miles long and 24 to 36 miles wide. The Boulder batholith is the most important economic geologic feature related to metals in Montana. At its edges occur many of the state's important metal deposits, including the Butte district which is one of the world's largest copper deposits. At Elkhorn the sedimentary rocks have been faulted, complexly intruded, metamorphosed, altered, and locally mineralized with silver, gold, lead, zinc, and copper. Intrusive rocks occur as irregular stocks ranging in composition from gabbro to granodiorite porphyry. The granodiorite porphyry forms an irregular, rougly y-shaped

body, about three miles long and up to 1500 feet in width. The porphyry resembles the mineralized intrusive at some porphyry copper mines and is mineralized with quartz veinlets and iron oxides at the surface. In places adjacent to the porphyry intrusive, sedimentary rocks have been converted to silicate minerals which are accompanied by disseminated pyrite and locally copper, lead, zinc, silver, and gold minerals.

EXPLORATION TARGET AREAS

Target Area 1. The railroad cut exposure north of the central portion of I.P. line MJ is an impressive surface exposure of quartz veinlets, molybdenite, and pyrite in altered granodiorite porphyry. Moderate to strong I.P. response was obtained at a shallow depth in the area. The two U.S. Borax drill holes appear to be an adequate test of the surface exposure and the shallow I.P. anomaly. Geologic relationships indicated by the drill holes need additional consideration but several important features are shown. Holes 1 and 1A contain a strong fault at the east edge of the granodiorite porphyry intrusive. The crushed zone along the fault is the locus for secondary copper mineralization at the porphyry-limestone contact, and concentrations of copper in the drill holes appear to result from secondary enrichment rather than from primary zoning. The porphyry exhibits its coarsest texture near the fault and becomes finer grained to the west, thus suggesting that the existing intrusive is a fault segment of a larger body that originally had relatively fine grained margins and a coarser interior. The fault probably dips 60 degrees to the west or southwest although additional geologic work is necessary for confirmation. Dips to the east are recognized in sedimentary rocks east of the intrusive and to the west of the intrusive and at depth in drill hole 2 west dips are prevalant. From this information it seems probable that the porphyry intrusive is a faulted portion of a west-dipping sill that may be intruded along the crest of an anticline. The moderate intensity, shallow I.P. anomaly on the east portion of line MJ probably has been tested by the drill holes, and little reason exists in view of present knowledge for additional testing of the locus.

Target Area 2. West of the U.S. Borax drill holes granodiorite porphyry exposed on the ridge west of the main Elkhorn road contains at least 3% iron oxide after sulfides. Iron oxide is mostly goethite which probably represents pyrite rather than copper sulfides at depth, but this is a fairly impressive occurrence of disseminated and fracture controlled mineralization. The intrusive appears to be contiguous with and probably has the same configuration as that cut by the drill holes to the east. If this is the case it may be a west dipping sill bounded on the northeast by a fault. Detailed geologic mapping

should be completed to confirm these relationships. This locus may justify a test by a relatively deep drill hole, but the location and inclination of such a hole are dependent on additional geologic mapping.

Target Area 3. Significant I.P. response overlaps the porphyry-sedimentary rock contact on lines MA, MB, and MC, 1000 to 1500 feet west of the Elkhorn townsite. Exposures are scarce in this soil and tree covered area and mine dumps, and a few shallow pits provide most of the surface information. Near the porphyry contact the Paleozoic limestones have been converted to the contact-metamorphic silicate minerals diopside, garnet, and epidote, and contain disseminated iron oxides and pyrite. Detailed geologic mapping might provide much-needed information in this area, and an attempt should be made to locate old mine records. At present no evidence of widespread copper values is known, but a small tonnage of gold mineralization is reported. Additional investigation of this locus is justified.

Target Area 4. Approximately 2,000 feet to the northwest of Target Area 3 along the same contact zone I.P. lines F, GDA, and GDB show moderate sulfide anomalies. Although few exposures are seen, information available indicates a zone of contact metamorphic silicate minerals adjacent to the contact that may be as much as 1,000 feet wide. Near the southeast corner of the Golden Dream claim disseminated copper sulfides are found on the dump of an old mine working. A chance for widespread copper mineralization exists in this area although additional geologic mapping and sampling are needed prior to drilling. Both target areas 3 and 4 fall at the edge of Siskon ownership and are partly on patented mining claims not presently being considered for option. Geologic work probably could be conducted in the area without securing this property, but options should be obtained prior to drill hole tests.

Target Area 5. Granodiorite porphyry bodies west of Target Area 3 are known from scattered exposures to contain weak to moderate amounts of sulfides at shallow depth. I.P. lines B, MA, MB, and MC in their west portions show moderate to strong intensity at varying depths. However, character of the iron oxides and the few sample results available do not indicate a significant copper content. Additional surface mapping, geochemical sampling, and analysis of I.P. results are needed to evaluate the possibility of copper sulfide mineralization in unexposed portions of the stock and at greater depth.

SUMMARY AND RECOMMENDATIONS

The Elkhorn District contains many of the geologic features known to be associated with porphyry copper deposits. No serious exploration work has been conducted in the district by any of the large exploration groups,

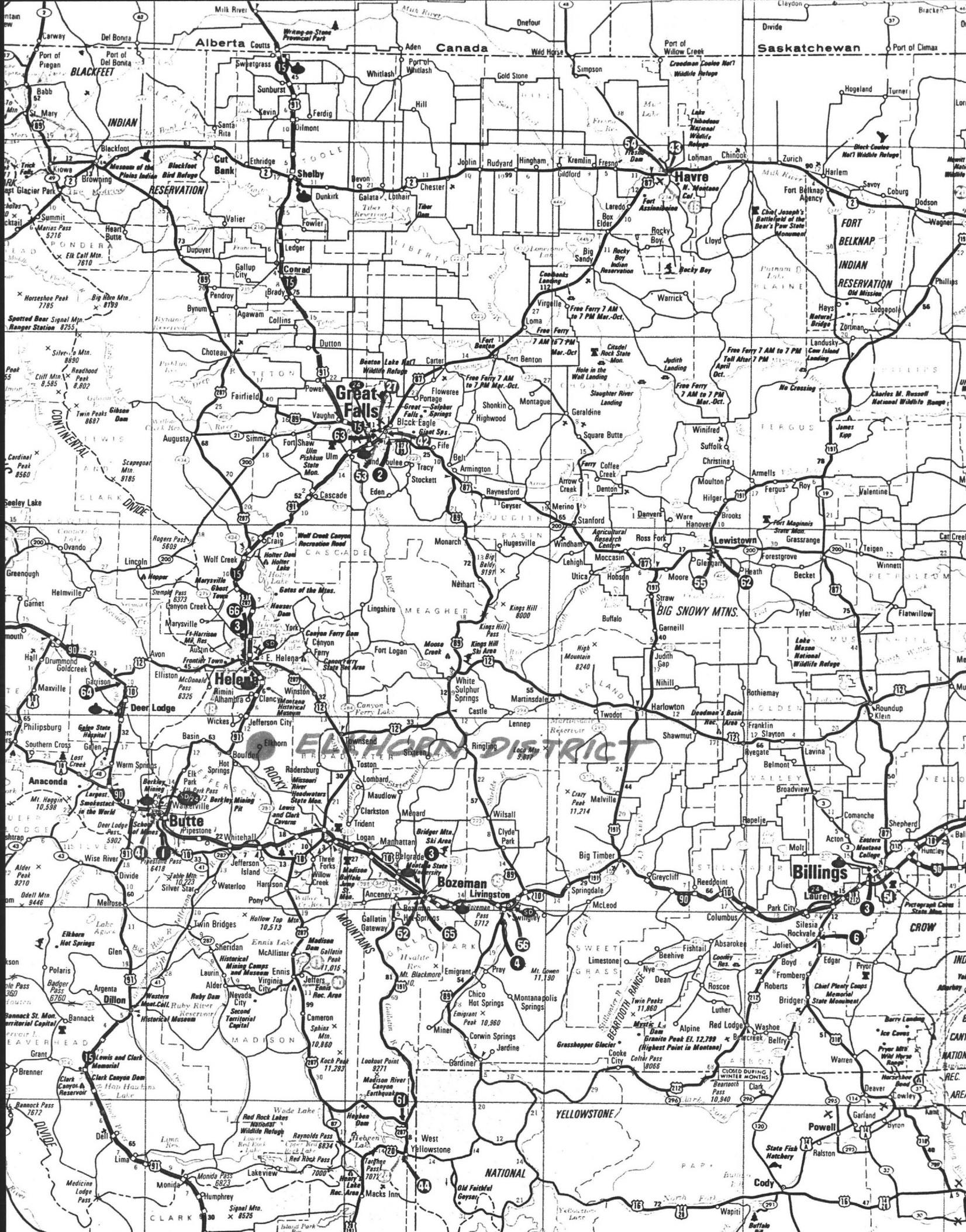
possibly because of a complex property situation, and possibly because only small quantities of copper mineralization are found at surface. U.S. Borax made a limited attempt at exploration, but only accomplished a test of one of five large scale copper targets on or partly on the Siskon claims. Four obvious target areas remain that need to be further evaluated by geologic mapping, geochemical sampling, and geophysical analysis. It is probable that this further investigation will indicate the need for substantial expenditures to conduct exploration drilling on one or more of the target areas. Two of the target areas will require options on patented mining claims held by individuals and small companies other than Siskon Corporation before they can be tested.

Also known in the district and possibly available for option are several mining properties in which are reported partly developed reserves of silver-gold-lead-zinc ore that should be considered.

No developed or blocked-out copper ore is known, so this will be a relatively high risk exploration venture. However, the Siskon property can be optioned and held for 6 months for a cost of only $4,000. Signing an option would preclude entry by other exploration groups, some of whom are known to be investigating the district, and would allow Essex time to evaluate the exploration targets. Time will not be available to complete the geologic and geochemical study prior to onset of winter conditions this year, and there is some question whether enough geologic work can be completed to justify a drill hole this year.

Because of the low cost of the first year of the proposed option agreement, it should be seriously considered by Essex. Geological work can be started prior to actual signing of an agreement, and investigation of property status and ownership should also commence. In addition to the option cost of $4,000 for the first six months possibly $1,000 will be spent for analysis of geophysical data and for laboratory charges on samples. If the target areas presently known continue to look attractive, from four to eight diamond drill holes totalling 8,000 to 16,000 feet of drilling will be needed to test the property. Total cost of such a program is estimated to range from $90,000 to $170,000 in its first phase that should be completed by late summer of 1975.

JKJ:td


Alberta
Canada
Saskatchewan
BLACKFEET
INDIAN
RESERVATION
Cut Bank
Shelby
Havre
Great Falls
Conrad
Helena
Deer Lodge
Anaconda
Butte
Dillon
Bozeman
Livingston
Billings
Laurel
Lewistown
FORT BELKNAP INDIAN RESERVATION
BIG SNOWY MTNS.
ELKHORN DISTRICT
CONTINENTAL DIVIDE
ROCKY MOUNTAINS
BEARTOOTH RANGE
YELLOWSTONE NATIONAL
CROW
Madison Buffalo Jump St. Mon.
Montana State University
Bridger Mtn. Ski Area
Kings Hill Ski Area
Lewis and Clark Caverns
Berkley Mining Pit
Largest Smokestack in the World
Lewis and Clark Memorial
Clark Canyon Dam
Clark Canyon Reservoir
Madison Dam
Gallatin Gateway
Madison River Canyon Earthquake
Hebgen Dam
Hebgen Lake
Red Rock Lakes National Wildlife Refuge
Old Faithful Geyser
Grasshopper Glacier
Granite Peak El. 12,799 (Highest Point in Montana)
Beartooth Pass 10,940
CLOSED DURING WINTER MONTHS
Chief Plenty Coups Memorial State Monument
Pryor Mtn. Wild Horse Range
Eastern Montana College
Medicine Lodge Pass
Monida Pass 6823
Lakeview
Red Rock Pass
Raynolds Pass 6834
Targhee Pass 7072
Henry Lake Rec. Area
Macks Inn
West Yellowstone
Cody
Powell
Wapiti
Buffalo
Ralston
State Fish Hatchery
Garland
Byron
Cowley
Deaver
Clark
Bridger
Warren
Belfry
Red Lodge
Roscoe
Luther
Alpine
Washoe
Bearcreek
Fishtail
Absaroke
Beehive
Nye
Dean
Limestone
Pryor
Edgar
Boyd
Fromberg
Roberts
Joliet
Rockvale
Silesia
Park City
Columbus
Molt
Acton
Huntley
Shepherd
Comanche
Laurel
Billings
Greycliff
Reedpoint
Big Timber
Springdale
McLeod
Livingston
Bozeman
Belgrade
Manhattan
Logan
Three Forks
Willow Creek
Ennis
Virginia City
Alder
Laurin
Sheridan
McAllister
Twin Bridges
Melrose
Divide
Silver Star
Waterloo
Harrison
Pony
Jefferson Island
Whitehall
Pipestone
Wise River
Jefferson City
Boulder
Elkhorn
Basin
Wickes
Radersburg
Toston
Townsend
Lombard
Maudlow
Clarkston
Trident
Menard
Wilsall
Clyde Park
Ringling
Sixteen
Martinsdale
Castle
Lennep
Twodot
Harlowton
Nihill
Judith Gap
Garneill
Buffalo
Straw
Moore
Glengarry
Heath
Becket
Forestgrove
Grassrange
Winnett
Teigen
Roundup
Klein
Franklin
Slayton
Shawmut
Ryegate
Belmont
Lavina
Broadview
Melville
Crazy Peak 11,214
Rothiemay
Deadman's Basin Rec. Area
Lake Mason National Wildlife Refuge
Fort Maginnis State Mon.
Agricultural Research Center
Ross Fork
Windham
Moccasin
Lehigh
Utica
Hobson
Stanford
Danvers
Ware
Hanover
Brooks
Hilger
Moulton
Fergus
Roy
Armells
Valentine
Christina
Suffolk
Winifred
Square Butte
Geraldine
Coffee Creek
Denton
Arrow Creek
Merino
Geyser
Raynesford
Belt
Armington
Tracy
Stockett
Eden
Cascade
Craig
Wolf Creek
Holter Dam
Holter Lake
Lincoln
Hopper
Helmville
Greenough
Ovando
Garnet
Marysville
Ft. Harrison Mil. Res.
Austin
Frontier Town
Canyon Creek
Canyon Ferry Dam
Canyon Ferry State Rec. Area
Canyon Ferry Lake
Hauser Dam
Gates of the Mtns.
Marysville Ghost Town
Stemple Pass 6373
Rogers Pass 5609
Wolf Creek Canyon Recreation Road
Elliston
Avon
Drummond
Goldcreek
Garrison
Philipsburg
Southern Cross
Galen
Galen State Hospital
Warm Springs
Hot Springs
Elk Park
Elk Park Pass
Wakeville
Deer Lodge Pass 5902
School of Mines
Pipestone Pass 6418
Table Mtn. 10,223
Alder Peak 9210
Odell Mtn. 9446
Mt. Haggin 10,598
Lost Creek
Hall
Maxville
Helena
Rimini
Alhampra
Clancy
Winston
Montana Historical Museum
Jefferson City
Elkhorn
Boulder
Basin
Wickes
Lingshire
Neihart
Monarch
Hugesville
Fort Logan
Moose Creek
White Sulphur Springs
Kings Hill 8000
Kings Hill Pass
High Mountain 8240
Big Baldy 9191
Hole in the Wall Landing
Citadel Rock State Mon.
Slaughter River Landing
Judith Landing
Free Ferry 7 AM to 7 PM Mar.-Oct.
Free Ferry 7 AM to 7 PM Tell After 7 PM April Oct.
No Crossing
Charles M. Russell National Wildlife Range
James Kipp
Fort Benton
Benton Lake Nat'l Wildlife Refuge
Great Sulphur Springs
Giant Sps.
Black Eagle
Vaughn
Power
Fairfield
Augusta
Simms
Fort Shaw
Ulm
Ulm Pishkun State Mon.
Sand Coulee
Dutton
Choteau
Carter
Portage
Floweree
Shonkin
Montague
Highwood
Virgelle
Loma
Coal banks Landing
Big Sandy
Rocky Boy Indian Reservation
Rocky Boy
Warrick
Lloyd
Laredo
Box Elder
Fresno
Kremlin
Gildford
Hingham
Rudyard
Joplin
Chester
Lothair
Galata
Dunkirk
Fowler
Ledger
Dupuyer
Gallup City
Pendroy
Brady
Bynum
Agawam
Collins
Valier
Heart Butte
Summit
Marias Pass 5216
Elk Calf Mtn. 7610
Horseshoe Peak 7785
Big Horn Mtn. 8199
Spotted Bear Signal Mtn. Ranger Station 8755
Silver Tip Mtn. 8690
Readhood Peak 8,802
Cliff Mtn. 8,565
Twin Peaks 8687
Gibson Dam
Scapegoat Mtn. 9185
Cardinal Peak 8560
Seeley Lake
Kiowa
Browning
Babb
St. Mary
East Glacier Park
Trick Falls
Museum of the Plains Indian
Blackfoot Bird Refuge
Blackfoot
Sweetgrass
Coutts
Port of Piegan
Port of Del Bonita
Del Bonita
Carway
Milk River
Writing-on-Stone Provincial Park
Sunburst
Kevin
Ferdig
Dilmont
Santa Rita
Whitlash
Port of Whitlash
Aden
Wild Horse
Onefour
Gold Stone
Simpson
Port of Willow Creek
Crowsnest Coulee Nat'l Wildlife Refuge
Lake Thibadeau National Wildlife Refuge
Fresno Dam
Fort Assiniboine
Chief Joseph's Battlefield of the Bear's Paw State Monument
Black Coulee Nat'l Wildlife Refuge
Fort Belknap Agency
Hogeland
Turner
Zurich
Chinook
Lohman
Harlem
Savoy
Coburg
Dodson
Wagner
Phillips
Hays
Lodgepole
Zortman
Natural Bridge
Old Mission
Landusky
Cow Island Landing
Divide
Bracken
Claydon
Port of Climax
Cat Creek
Teigen
Winnett
Petroleum
Valley
Yellowstone
Musselshell
Golden Valley
Stillwater
Sweet Grass
Madison
Beaverhead
Jefferson
Lewis
Teton
Pondera
Liberty
Toole
Glacier
Flathead
Lake
Powell
Deer Lodge
Silver Bow
Broadwater
Meagher
Judith Basin
Fergus
Petroleum
Phillips
Blaine
Hill
Cascade
Clark
Ravalli
Granite
Mineral
Missoula
Sanders
Lincoln
Flathead
Glacier
Pondera
Teton
Chouteau
Cascade
Meagher
Wheatland
Golden Valley
Musselshell
Yellowstone
Stillwater
Carbon
Big Horn
Rosebud
Custer
Prairie
Dawson
Wibaux
Fallon
Carter
Powder River
Garfield
Petroleum
Fergus
Phillips
Valley
Daniels
Sheridan
Roosevelt
Richland
McCone
Dawson
Prairie
Fallon
Wibaux
Carter
Powder River
Rosebud
Treasure
Yellowstone
Big Horn
Musselshell
Golden Valley
Wheatland
Sweet Grass
Stillwater
Carbon
Park
Gallatin
Madison
Beaverhead
Jefferson
Broadwater
Lewis and Clark
Cascade
Teton
Pondera
Toole
Liberty
Hill
Blaine
Chouteau
Glacier
Flathead
Lake
Sanders
Lincoln
Mineral
Missoula
Ravalli
Granite
Deer Lodge
Silver Bow
Powell
Ravalli
Mineral
Sanders
Lake
Flathead
Glacier
Toole
Liberty
Hill
Blaine
Phillips
Valley
Daniels
Sheridan
Roosevelt
Richland
McCone
Dawson
Prairie
Fallon
Wibaux

REPORT ON THE ELKHORN DISTRICT

Jefferson County, Montana

INTRODUCTION

On August 30, 1974, J.K. Jones reviewed maps and reports on the Elkhorn District in the offices of Siskon Corporation in Reno, Nevada. Siskon owns 84 unpatented and 8 patented mining claims in the Elkhorn Mining District of Jefferson County, Montana. Production during the period 1902 to 1957 from several mines totalled 726,455 tons containing 61,295 ounces of gold, 6,152,555 ounces of silver, over 1 million pounds of copper, 12 million pounds of lead and 3 million pounds of zinc. At present prices this metal production would have a value of nearly $38 million.

GEOLOGY

The mineralized district occurs along the east edge of the Boulder batholith, a large body of quartz monzonite about which are scattered numerous mining districts including the Butte District about 40 miles to the southwest. At Elkhorn a thick series of Paleozoic and Mesozoic sedimentary rocks are overlain by Cretaceous volcanics and intruded by granitic rocks and porphyries probably related to the Laramide-age Boulder batholith. Numerous small stock-like intrusives of variable composition are found in the Elkhorn District, and some of these are reported to be hydrothermally altered and contain disseminated sulfide mineralization. Adjacent to the intrusives in places sedimentary rocks are altered, mineralized, and cut by veins containing gold and base metal mineralization. Most production has been from replacement type mineralization in sedimentary rocks near the intrusives. Some possibility exists for discovery of additional high grade silver-lead-copper orebodies, but the most important exploration target is a large disseminated porphyry copper deposit. Such a deposit could exist either within the porphyry intrusives or in silicate altered sedimentary rocks adjacent to the intrusives.

RECENT EXPLORATION WORK

An induced polarization survey indicates widespread sulphide mineralization generally centered about the intrusive. U.S. Borax and Chemical Corporation in late 1973 through early 1974 drilled two inclined core holes 600 to 975 feet deep into a portion of the intrusive and encountered weak but anomalous quantities of copper and molybdenum mineralization. These two holes do not provide an adequate test of a possible porphyry copper target at Elkhorn.

RECOMMENDATIONS

A field examination will start in the next few days in order to confirm geologic features of the district. Information available strongly suggests the possibility of a porphyry copper exploration target on the Siskon property. Additional geologic, geochemical, and geophysical analysis are needed, but initial portions of this work can be accomplished in a few weeks if personnel are available. If the field examination confirms data reviewed to date an RFA will be submitted and an option obtained on this property. Weather conditions normally permit field work until early December, so one drill hole might be completed before low termperatures and snow make operations difficult and costly. This initial RFA will be for approximately $ 58,400 but will not be adequate to complete an exploration program at Elkhorn. After preliminary study and one drill hole are completed under this first RFA, results will be evaluated and another RFA submitted early in 1975 in order to complete exploration of the target.

JKJ

J.K. Jones

JKJ:td

ELKHORN, MONTANA PROJECT
PROJECTED COSTS
October 1, 1974 thru March 1975

1.	Property Payments $2500 down payment plus $750 per month for 6 months	$ 7,000
2.	Geophysics Analysis of existing data	2,500
3.	Drill Site Preparation, Roads	4,000
4.	Drilling 2,000 foot core hole @ $15 per foot	30,000
5.	Assaying, Geochemistry Core assays @ $1 per foot plus 200 geochemical samples @ $2.50 each	2,500
6.	Surveying	6,000
7.	Labor 1 man to handle & split core, survey, and collect samples - 3 months @ $800 per mo.	2,400
8.	Transportation Rental pickup, 3 months @ $500 per mo.	1,500
9.	Storage, Supplies Rental of core storage spece @ $150 per month; Sample bags, core splitter, core boxes, heater	2,500
	Total	$58,400

H. Lanier — Ft. Wayne, Ind.

R.E. Holt — Tucson, Ariz.

Negotiations - Elkhorn Property — Sept. 20, 1974
Siskon Corporation

Grover Heinrichs and I met with Mr. Hugh Chessher of the Siskon Corporation in Reno, Nevada on Sept. 19, 1974 and discussed a deal on the Elkhorn property in Montana.

The meeting went well and the terms are as follows:

Price: $1,500,000.

Terms: $2,500 down.
$ 250/mo for 11 months
500/mo for 2nd year
1,000/mo for 3rd year
2,000/mo for 4th year
4,000/mo for 5th year
Balance of purchase price at end of 5th year.

Royalty: 5% NSR to apply on purchase price.
Permanent Royalty: 2% NSR after property is purchased.

There are two other companies dealing on the property and it's a first-come first-served basis. Both Ken Jones and I recommend going ahead, at least on getting it tied up. The deal is easy enough so that we can put off drilling until next spring; however, we will do some geological work and make some geochemistry this fall.

REH:td

Deal: Price: $1,500,000

Terms: $2500 down

250/mo. for 11 months

500/mo. for 2nd year

1000/mo. for 3rd year

2000/mo. for 4th year

4000/mo. for 5th year

Balance of purchase price at end of 5th year.

Royalty: 5% NSR to apply on purchase price

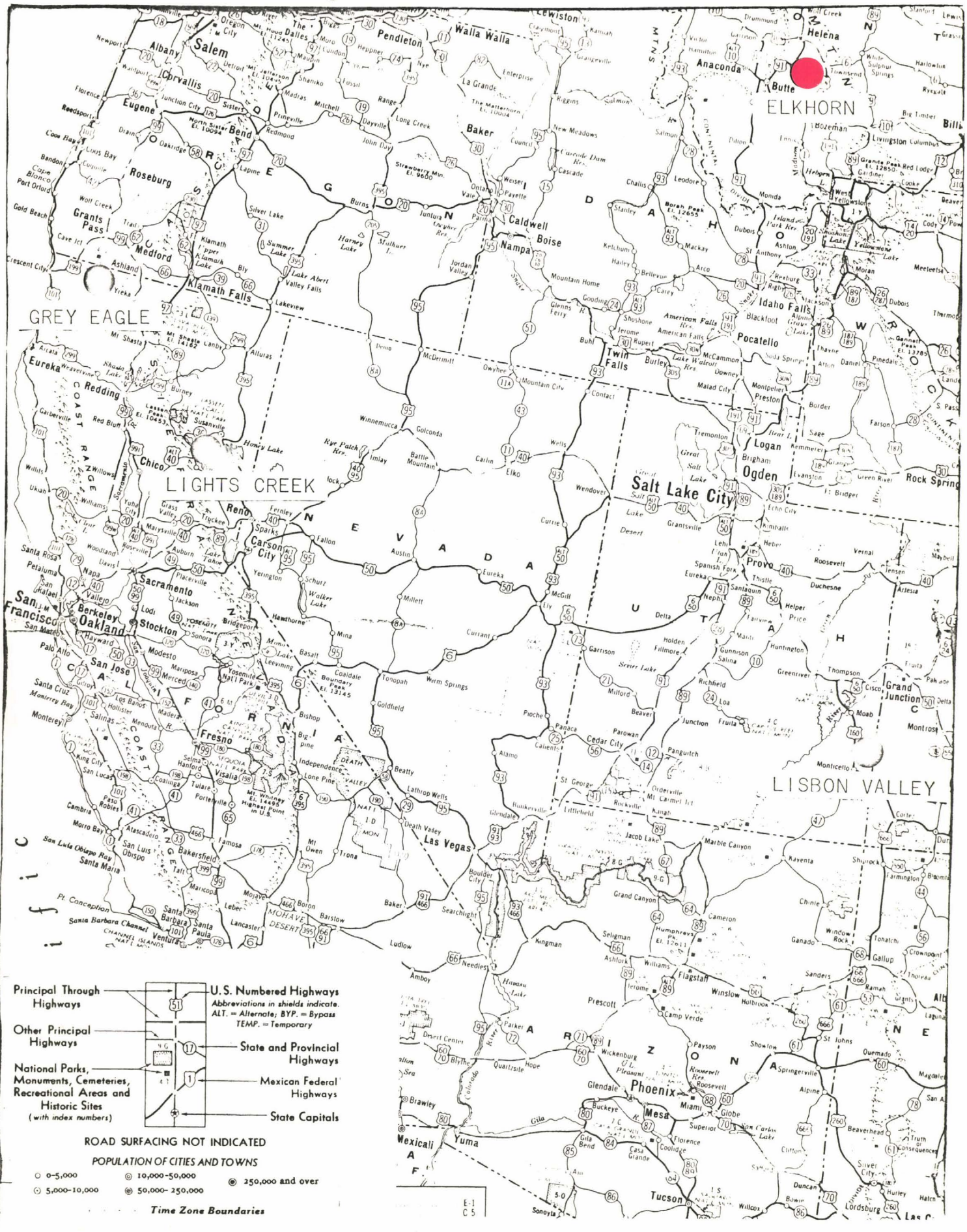
Permanent Royalty: 2% NSR after property is purchased.

Regards, Hugh

REPORT ON THE ELKHORN MINING DISTRICT

Jefferson County, Montana

WESTERN U.S.A. INDEX MAP



ESSEX

ESSEX INTERNATIONAL, INC.
1704 WEST GRANT RD., TUCSON, ARIZONA 85705
PHONE (602) 624-7421

One inch equals approximately 112 miles.

REPORT ON THE ELKHORN MINING DISTRICT Jefferson County, Montana

J.K. Jones

September 26, 1974

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Because of the location and elevation of the area, snowfall and cold weather are an important factor in scheduling exploration activity. Surface geologic work and sampling probably are restricted to the period May through October in most years. Heavy snows and extremely cold weather normally would not be expected before December, however. Drilling can be conducted during the winter months, but this incurs considerably increased costs and loss of efficiency. The nearest town for which weather data is available is Boulder which is located 20 miles to the west via 12 miles of improved dirt road and 8 miles of paved road. Boulder records slightly less precipitation and slightly warmer winter temperatures than do Butte and Helena.

HISTORY

Production previously reported covered the period 1902 to 1957. Additional data has been found on production prior to 1901 which is nearly equal to that after 1901. The following table lists total recorded production from the district.

Gold (ounces)	Silver (ounces)	Lead (pounds)	Zinc (pounds)	Copper (pounds)
70,015	14,982,751	16,608,000	6,162,000	766,000

At present metal prices this production would have a gross value in excess of $76,000,000. Mining started in the district in about 1875, and the townsite contains numerous old buildings that are now a tourist attraction. Future mining operations may have to preserve the townsite.

Siskon Corporation purchased several patented mining claims prior to World War II, then in recent years expanded their property position to include 8 patented and 84 unpatented mining claims. An I.P. survey was completed and geologic mapping undertaken in an attempt to define a porphyry copper target. In late 1973 and early 1974 U.S. Borax drilled two core holes 975 and 690 feet deep to test at relatively shallow depth below a surface exposure of weak molybdenum mineralization.

TERMS

Siskon Corporation has indicated a desire to option their group of 92 mining claims for a down payment of $2500, with monthly payments starting at $250 the first year and doubling each year thereafter. At the end of the fifth year an end price of $1,500,000 would fall due, and a 2% net smelter royalty would be retained by Siskon.

GEOLOGY

The Elkhorn District is in a belt of complexly intruded sedimentary rocks along the crest and east limb of a north-plunging anticline. The west limb of the anticline has been engulfed by the Boulder batholith, a body of intrusive quartz monzonite approximately 80 miles long and 24 to 36 miles wide. The Boulder batholith is the most important economic geologic feature related to metals in Montana. At its edges occur many of the state's important metal deposits, including the Butte district which is one of the world's largest copper deposits. At Elkhorn the sedimentary rocks have been faulted, complexly intruded, metamorphosed, altered, and locally mineralized with silver, gold, lead, zinc, and copper. Intrusive rocks occur as irregular stocks ranging in composition from gabbro to granodiorite porphyry. The granodiorite porphyry forms an irregular, rougly y-shaped

body, about three miles long and up to 1500 feet in width. The porphyry resembles the mineralized intrusive at some porphyry copper mines and is mineralized with quartz veinlets and iron oxides at the surface. In places adjacent to the porphyry intrusive, sedimentary rocks have been converted to silicate minerals which are accompanied by disseminated pyrite and locally copper, lead, zinc, silver, and gold minerals.

EXPLORATION TARGET AREAS

Target Area 1. The railroad cut exposure north of the central portion of I.P. line MJ is an impressive surface exposure of quartz veinlets, molybdenite, and pyrite in altered granodiorite porphyry. Moderate to strong I.P. response was obtained at a shallow depth in the area. The two U.S. Borax drill holes appear to be an adequate test of the surface exposure and the shallow I.P. anomaly. Geologic relationships indicated by the drill holes need additional consideration but several important features are shown. Holes 1 and 1A contain a strong fault at the east edge of the granodiorite porphyry intrusive. The crushed zone along the fault is the locus for secondary copper mineralization at the porphyry-limestone contact, and concentrations of copper in the drill holes appear to result from secondary enrichment rather than from primary zoning. The porphyry exhibits its coarsest texture near the fault and becomes finer grained to the west, thus suggesting that the existing intrusive is a fault segment of a larger body that originally had relatively fine grained margins and a coarser interior. The fault probably dips 60 degrees to the west or southwest although additional geologic work is necessary for confirmation. Dips to the east are recognized in sedimentary rocks east of the intrusive and to the west of the intrusive and at depth in drill hole 2 west dips are prevalant. From this information it seems probable that the porphyry intrusive is a faulted portion of a west-dipping sill that may be intruded along the crest of an anticline. The moderate intensity, shallow I.P. anomaly on the east portion of line MJ probably has been tested by the drill holes, and little reason exists in view of present knowledge for additional testing of the locus.

Target Area 2. West of the U.S. Borax drill holes granodiorite porphyry exposed on the ridge west of the main Elkhorn road contains at least 3% iron oxide after sulfides. Iron oxide is mostly goethite which probably represents pyrite rather than copper sulfides at depth, but this is a fairly impressive occurrence of disseminated and fracture controlled mineralization. The intrusive appears to be contiguous with and probably has the same configuration as that cut by the drill holes to the east. If this is the case it may be a west dipping sill bounded on the northeast by a fault. Detailed geologic mapping

should be completed to confirm these relationships. This locus may justify a test by a relatively deep drill hole, but the location and inclination of such a hole are dependent on additional geologic mapping.

Target Area 3. Significant I.P. response overlaps the porphyry-sedimentary rock contact on lines MA, MB, and MC, 1000 to 1500 feet west of the Elkhorn townsite. Exposures are scarce in this soil and tree covered area and mine dumps, and a few shallow pits provide most of the surface information. Near the porphyry contact the Paleozoic limestones have been converted to the contact-metamorphic silicate minerals diopside, garnet, and epidote, and contain disseminated iron oxides and pyrite. Detailed geologic mapping might provide much-needed information in this area, and an attempt should be made to locate old mine records. At present no evidence of widespread copper values is known, but a small tonnage of gold mineralization is reported. Additional investigation of this locus is justified.

Target Area 4. Approximately 2,000 feet to the northwest of Target Area 3 along the same contact zone I.P. lines F, GDA, and GDB show moderate sulfide anomalies. Although few exposures are seen, information available indicates a zone of contact metamorphic silicate minerals adjacent to the contact that may be as much as 1,000 feet wide. Near the southeast corner of the Golden Dream claim disseminated copper sulfides are found on the dump of an old mine working. A chance for widespread copper mineralization exists in this area although additional geologic mapping and sampling are needed prior to drilling. Both target areas 3 and 4 fall at the edge of Siskon ownership and are partly on patented mining claims not presently being considered for option. Geologic work probably could be conducted in the area without securing this property, but options should be obtained prior to drill hole tests.

Target Area 5. Granodiorite porphyry bodies west of Target Area 3 are known from scattered exposures to contain weak to moderate amounts of sulfides at shallow depth. I.P. lines B, MA, MB, and MC in their west portions show moderate to strong intensity at varying depths. However, character of the iron oxides and the few sample results available do not indicate a significant copper content. Additional surface mapping, geochemical sampling, and analysis of I.P. results are needed to evaluate the possibility of copper sulfide mineralization in unexposed portions of the stock and at greater depth.

SUMMARY AND RECOMMENDATIONS

The Elkhorn District contains many of the geologic features known to be associated with porphyry copper deposits. No serious exploration work has been conducted in the district by any of the large exploration groups,

possibly because of a complex property situation, and possibly because only small quantities of copper mineralization are found at surface. U.S. Borax made a limited attempt at exploration, but only accomplished a test of one of five large scale copper targets on or partly on the Siskon claims. Four obvious target areas remain that need to be further evaluated by geologic mapping, geochemical sampling, and geophysical analysis. It is probable that this further investigation will indicate the need for substantial expenditures to conduct exploration drilling on one or more of the target areas. Two of the target areas will require options on patented mining claims held by individuals and small companies other than Siskon Corporation before they can be tested.

Also known in the district and possibly available for option are several mining properties in which are reported partly developed reserves of silver-gold-lead-zinc ore that should be considered.

No developed or blocked-out copper ore is known, so this will be a relatively high risk exploration venture. However, the Siskon property can be optioned and held for 6 months for a cost of only $4,000. Signing an option would preclude entry by other exploration groups, some of whom are known to be investigating the district, and would allow Essex time to evaluate the exploration targets. Time will not be available to complete the geologic and geochemical study prior to onset of winter conditions this year, and there is some question whether enough geologic work can be completed to justify a drill hole this year.

Because of the low cost of the first year of the proposed option agreement, it should be seriously considered by Essex. Geological work can be started prior to actual signing of an agreement, and investigation of property status and ownership should also commence. In addition to the option cost of $4,000 for the first six months possibly $1,000 will be spent for analysis of geophysical data and for laboratory charges on samples. If the target areas presently known continue to look attractive, from four to eight diamond drill holes totalling 8,000 to 16,000 feet of drilling will be needed to test the property. Total cost of such a program is estimated to range from $90,000 to $170,000 in its first phase that should be completed by late summer of 1975.

JKJ:td

REQUEST FOR APPROPRIATION

NUMBER _____

REQUESTS MUST BE FILED FOR ITEMS COSTING $250.00 OR MORE

LOCATION Tucson, Arizona DIVISION Metallurgical & Mining DATE 9-12-74

REQUEST IS HEREBY MADE FOR AN APPROPRIATION OF $ 58,400.00 FOR ITEMS NOTED BELOW

APPROVED BY

REQUESTED BY R.E. Holt DATE _____ | PRESIDENT _____ DATE _____

VICE PRESIDENT _____ DATE _____ | CHM. OF BOARD _____ DATE _____

COMPLETE DESCRIPTION AND ANALYSIS OF ESTIMATED COST OF ITEMS TO BE EXPENSED

W.O. NUM	ACC'T NUM.		$
		ELKHORN DISTRICT, MONTANA	
		Property Payments	7,000
		Geophysics	2,500
		Roads, Drill Sites	4,000
		Drilling	30,000
		Assaying, Geochemistry	2,500
		Surveying	6,000
		Labor	2,400
		Transportation	1,500
		Storage, Supplies	2,500
		TOTAL EXPENSED	$58,400

AUTHORIZED BUDGET ADDER YES ☐ NO ☐ DIV. CONTROLLER _____

COMPLETE DESCRIPTION AND ANALYSIS OF ESTIMATED COST OF ITEMS TO BE CAPITALIZED

W.O. NUM.	ACC'T NUM.		$
		These costs will be capitalized if the project becomes an operating property.	
		TOTAL CAPITALIZED	$

GRAND TOTAL → $58,400.00

INDICATE BELOW THE COST SAVINGS RESULTING FROM THIS EXPENDITURE AND HOW THE EXPENDITURE WILL BE RECOVERED, OR WHY THE EXPENDITURE IS NECESSARY.

This will provide funds to option and conduct preliminary exploration work on a porphyry copper prospect in Jefferson County, Montana. If results of this preliminary work are encouraging a second phase at a cost of approximately $250,000 will be necessary. This RFA will be expended in 6 months or less, and the second phase work will commence in March or April of 1975 and be completed in a 6-month period.

This property can be obtained on a relatively low cost option of $2,500 down payment and $250 per month for the first year, thus if the property position is acquired this work may be scheduled to accommodate other exploration priorities.

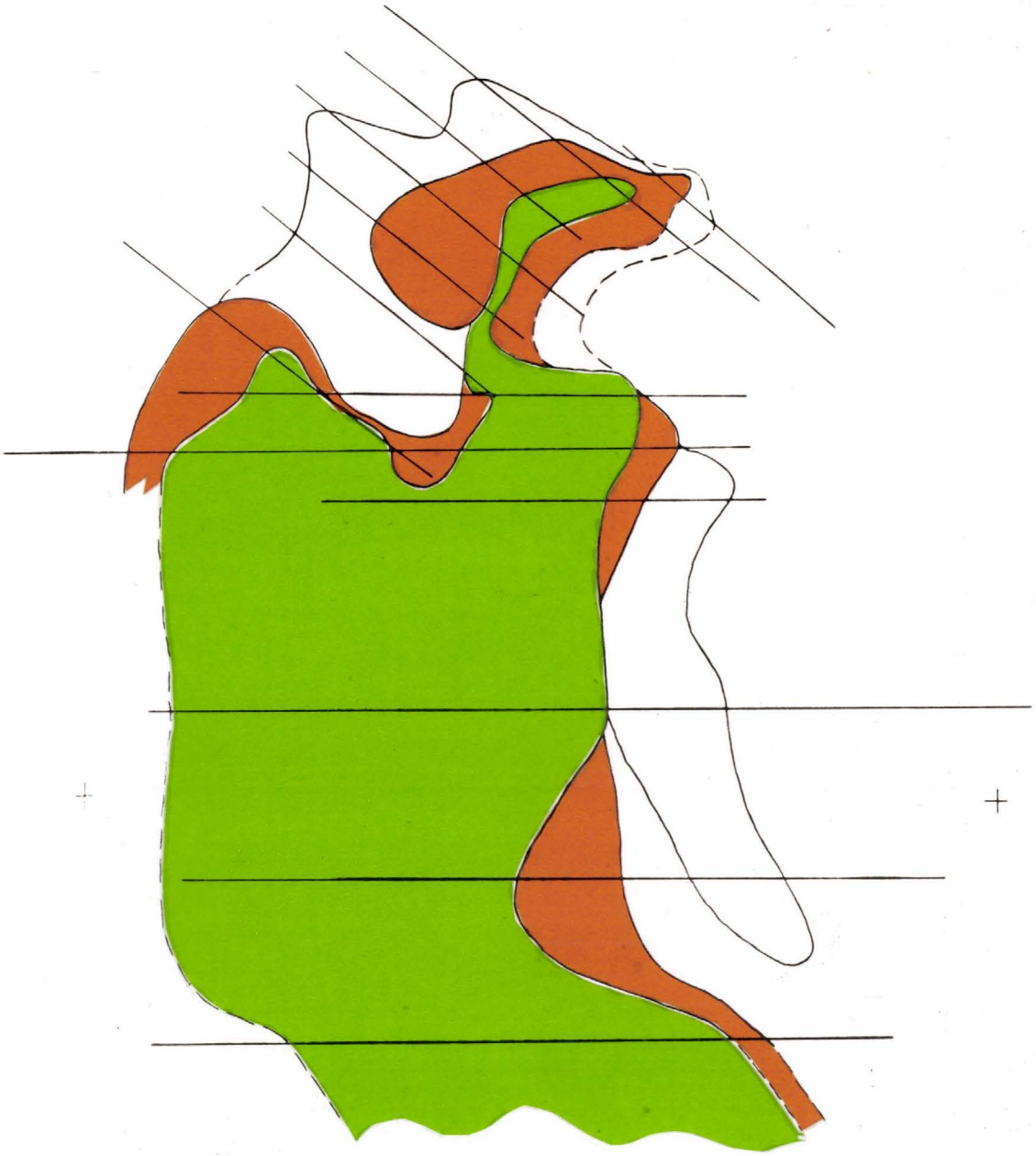
See attached report for details.

WHITE COPY . . . . ORIGINATOR
YELLOW COPY . . . CORPORATE
BLUE COPY . . . . DIVISIONAL COPY

USE REVERSE SIDE IF NEEDED

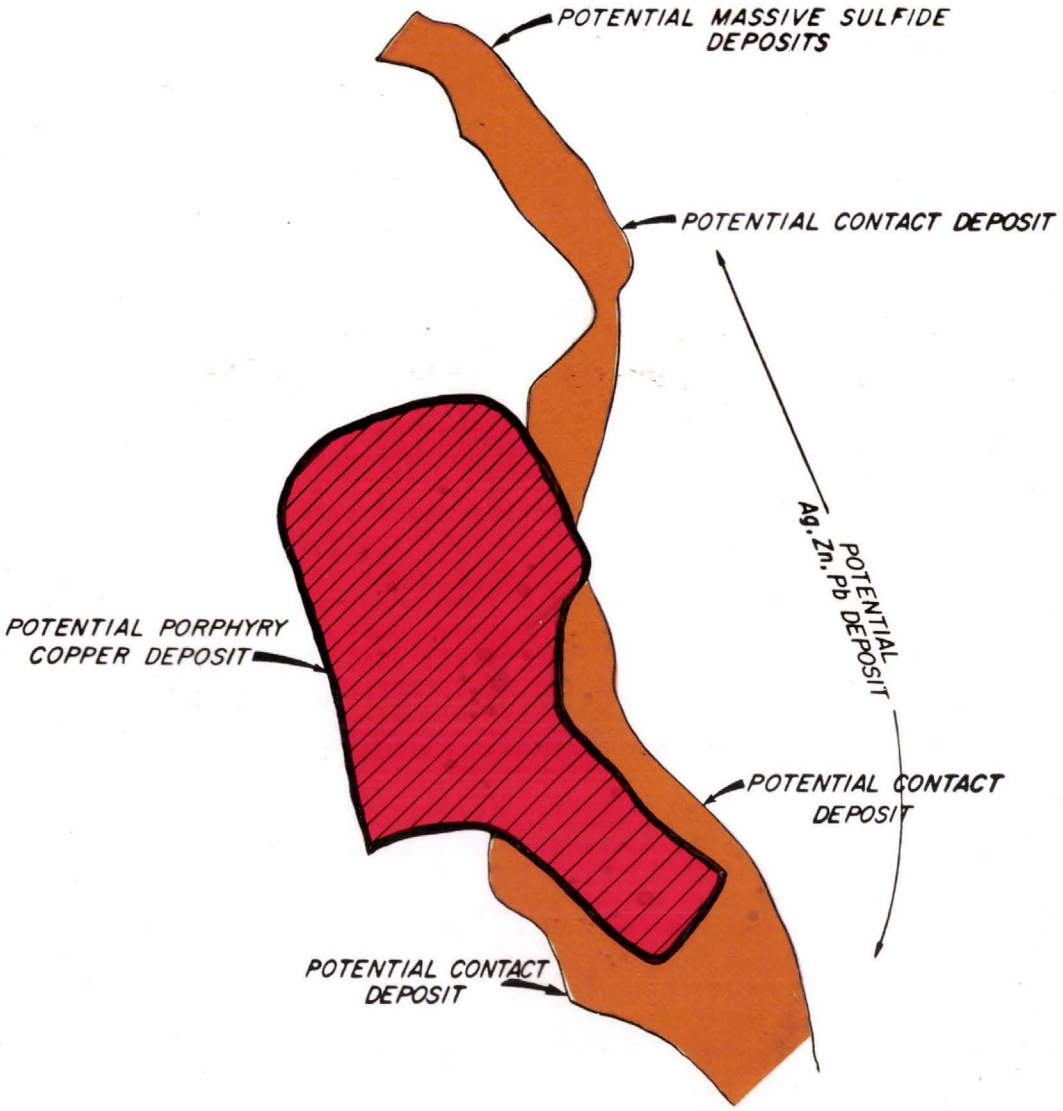
ELKHORN, MONTANA PROJECT
PROJECTED COSTS
October 1, 1974 thru March 1975

1.	Property Payments $2500 down payment plus $750 per month for 6 months	$ 7,000
2.	Geophysics Analysis of existing data	2,500
3.	Drill Site Preparation, Roads	4,000
4.	Drilling 2,000 foot core hole @ $15 per foot	30,000
5.	Assaying, Geochemistry Core assays @ $1 per foot plus 200 geochemical samples @ $2.50 each	2,500
6.	Surveying	6,000
7.	Labor 1 man to handle & split core, survey, and collect samples - 3 months @ $800 per mo.	2,400
8.	Transportation Rental pickup, 3 months @ $500 per mo.	1,500
9.	Storage, Supplies Rental of core storage spece @ $150 per month; Sample bags, core splitter, core boxes, heater	2,500
	Total	$58,400

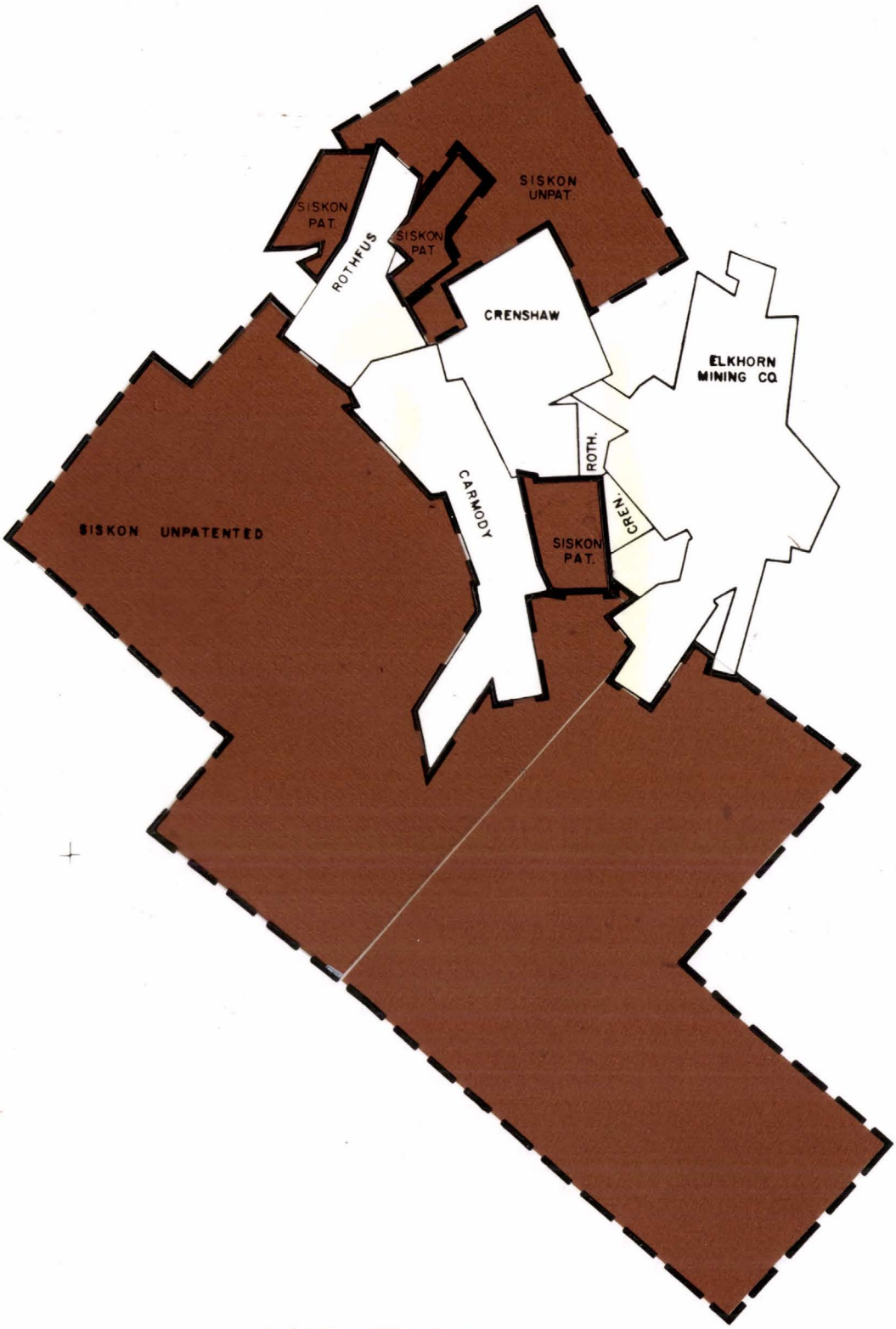


GEOPHYSICAL ANOMALIES

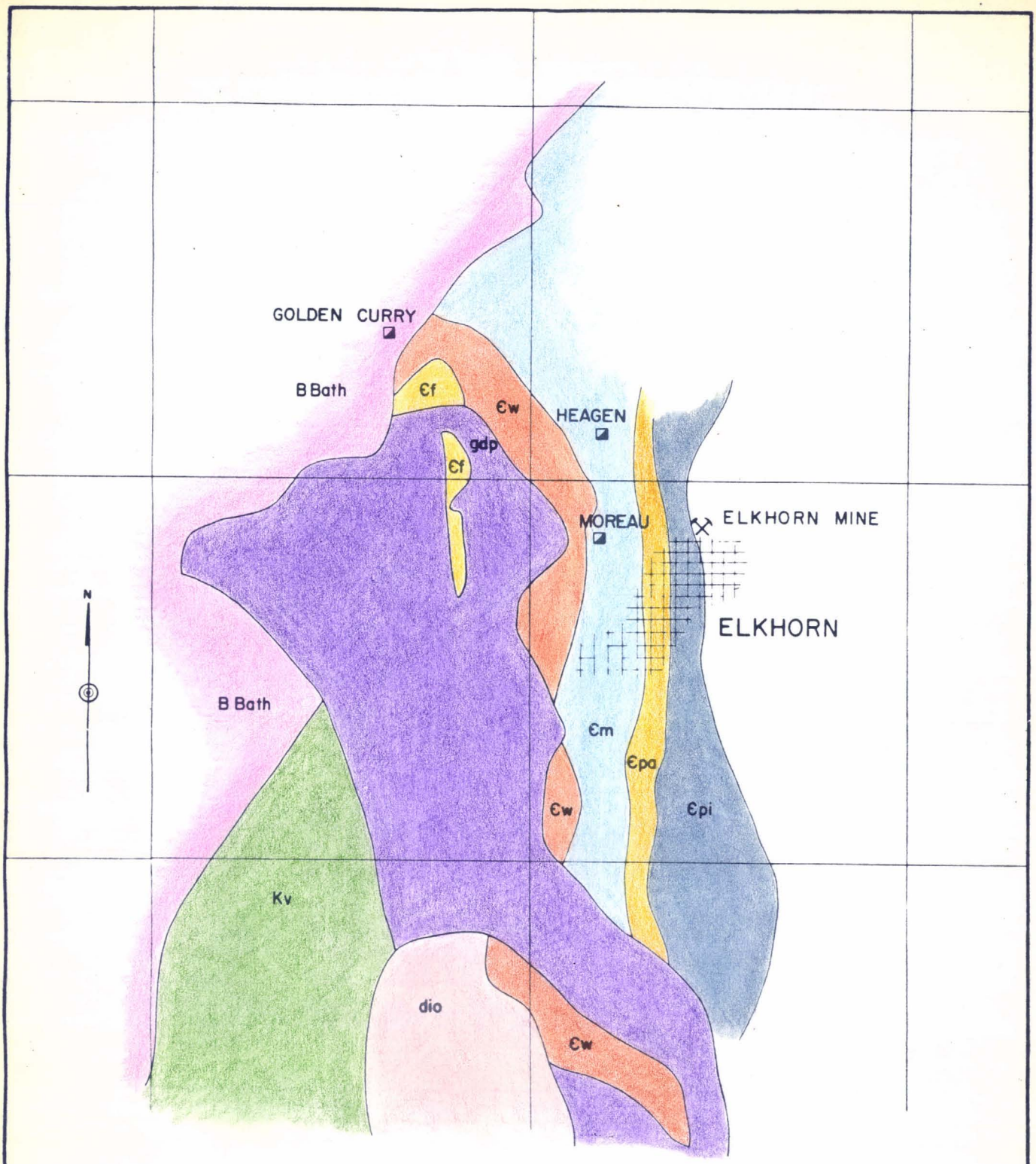
STRONG
MEDIUM
WEAK



TARGET AREAS


SISKON PAT.
ROTHFUS
SISKON PAT.
SISKON UNPAT.
CRENSHAW
ELKHORN MINING CO.
ROTH.
CRENSHAW
CARMODY
SISKON UNPATENTED
SISKON PAT.

LAND STATUS



GRANODIORITE PORPHYRY
B Bath BOULDER BATHOLITH
dio DIORITE
Kv VOLCANICS
Єpi PILGRIM DOLOMITE
Єpa PARK SHALE
Єm MEAGHER LIMESTONE
Єw WOLSEY SHALE
Єf FLATHEAD QUARTZITE

egh/9-27-74

ESSEX

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PHONE (602) 624-7421

INFO. FROM

SISKON CORP.

ELKHORN PROJECT

JEFFERSON COUNTY, MONTANA

GEOLOGIC MAP

FEET 800 0 1000 2000 3000 4000 5000 FEET
SCALE 1" = 500'