840797

REPORT ON FIELD WORK

1975

ROCKY MOUNTAIN PROJECT

C429

APRIL 1976

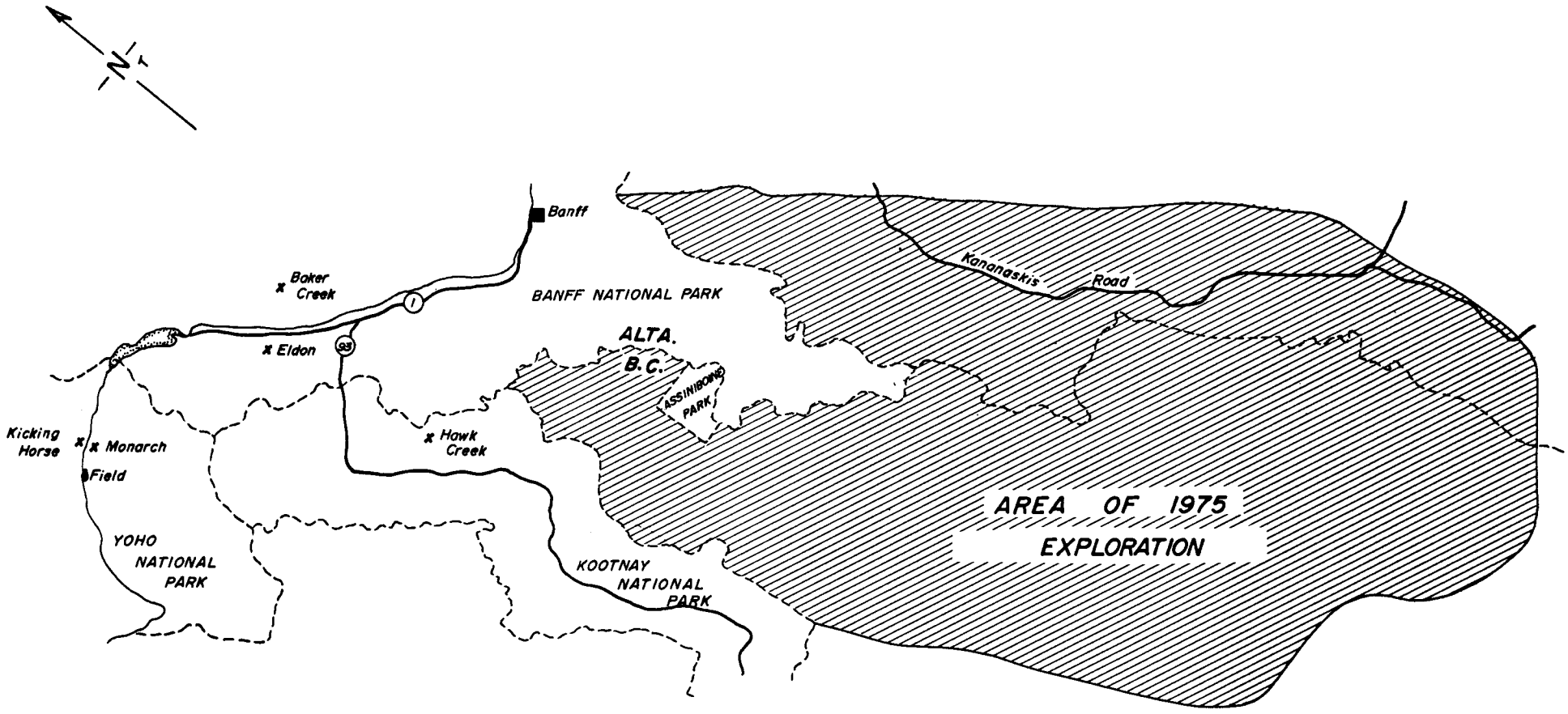
by

J. W. SIMPSON

TABLE OF CONTENTS

APPENDICES

FIGURES



C 429

x Pb - Zn in carbonates

ROCKY MOUNTAIN PROJECT

1975 PROGRAM

0 4 8 12 16
Miles

July 1975

ROCKY MOUNTAIN PROJECT

C429

Introduction:

The Rocky Mountain project was proposed to prospect the Southern Rockies for Zn-Pb deposits in carbonate rocks. A three part approach was used; namely, compile all information on regional geology and known deposits, examine known mineralization in the field and finally prospect areas that had good potential in light of initial studies.

Summary:

During January of 1975 a compilation of available information was made and the field work was planned. Projects of higher priority delayed field work on the known showings until late August and the prospecting portion of the program could not be started until September. Early snow storms occurred and virtually all of the prospective areas, which are at high elevations, were covered. Very little prospecting could be done and the project was abandoned for 1975.

Conclusions:

Examination of known mineralization showed that only one deposit; namely, the Monarch-Kicking Horse was of the type sought. It is quite small but high grade and total production from 1912 was 850,000 tons grading 7% Pb, 10% Zn and 1.2 oz Ag.

Regional control is thought to be the facies change from shelf carbonate to basinal argillaceous carbonate in the Middle Cambrian Cathedral formation. Local control is primarily structural relating to minor NW trending folds and apparently related becciation and dolomitization.

Secondary zinc minerals form in most of the known showings but generally these minerals are not widely distributed. The "zinc spray" was effective in identifying these minerals but limited dispersion of the minerals in turn limits usefulness of the spray as a prospecting tool.

One deposit, Eldon, has a creek running through the main showing and this creek was sampled in three places down stream to observe the transport of zinc. Fairly high values and reasonable down stream dispersion were obtained but the Eldon deposit is not characteristic of the type sought and considerable blasted material had contaminated the stream. Under the most favourable conditions stream geochemistry is only moderately useful thus under more general conditions application of this technique is limited.

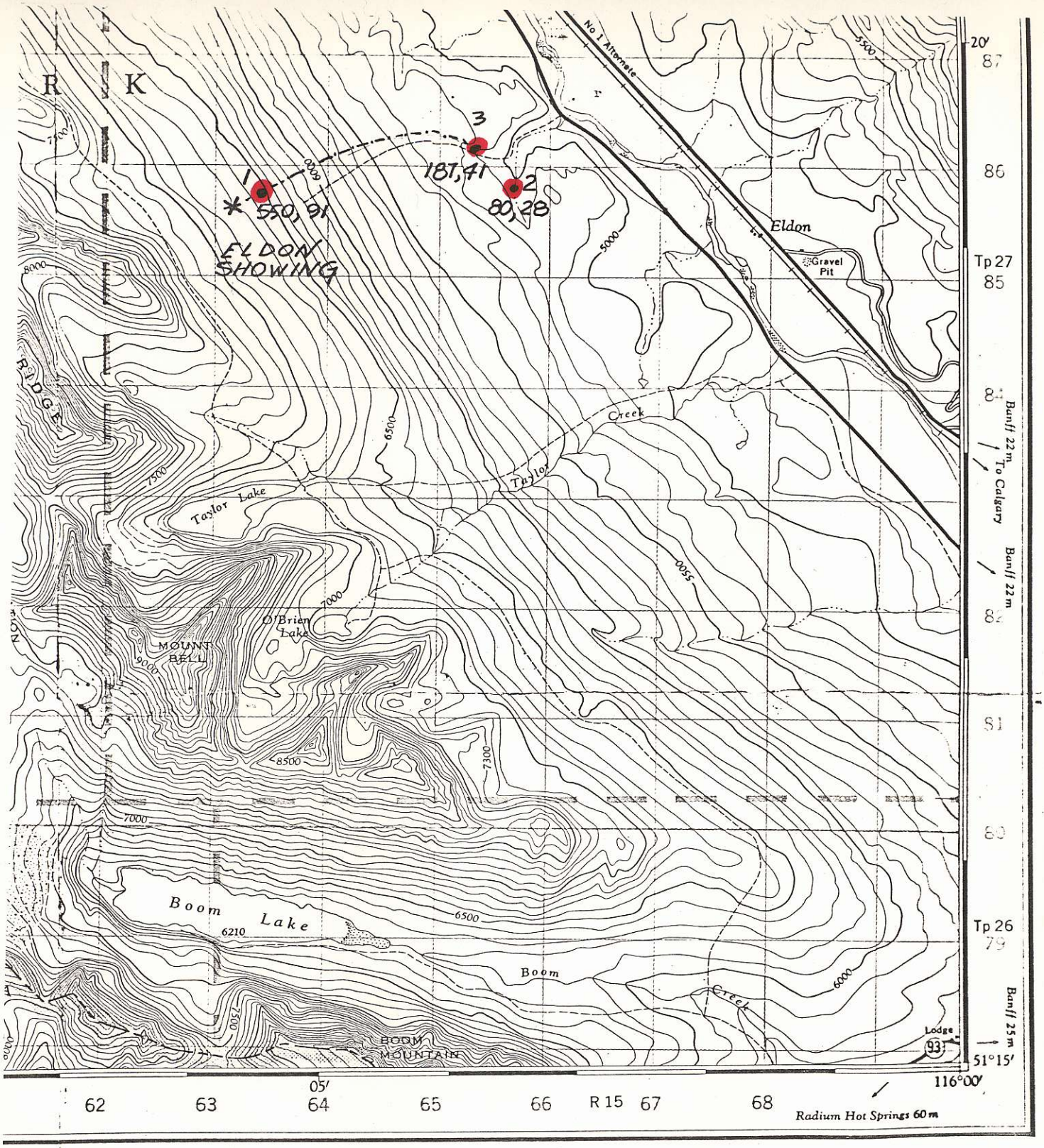
Recommendations:

A large area south of the Monarch-Kicking Horse deposit remains to be prospected. This area is outlined on the accompanying map.

Detailed prospecting near the top of talus slopes where outcrop and talus can be examined is recommended. Areas where iron stains were noted from the reconnaissance flying deserve special attention. Barite showings and other specific areas of interest discussed with G. Henderson and C. Dahlstrom will also be checked.

A budget of $20,000 is proposed to complete the field work described above.

J. W. SIMPSON



CHEVRON STANDARD LTD

ROCKY MOUNTAIN PROJECT

C 429

ELDON SHOWING GEOCHEM

SCALE 1:50,000

LEGEND

● 520, 65
Zn Cu

FIG 2


Palliser Lake
Back Lake
MOUNT LEROY
9874
MOUNT BACK
LOCKWOOD PEAK
MOUNT CRADOCK
Palliser
Tipperary
Tipperary Lake
Bratty Creek
PARK
FRONT
MOUNT QUEEN MARY
MOUNT PRINCE JOHN
CAMP SITE
RUST ZONE IN CAMB-ORDO McKAY GROUP CARBONATE.
GOVERNMENT
THE
MOUNT PRINCE HENRY
10587
ROYAL GROUP
MOUNT PRINCE EDWARD
MOUNT PRINCE ALBERT
MOUNT PRINCE GEORGE
MOUNT KING GEORGE
10,500
RESERVE
MOUNT PRINCESS MARY
TIPPERARY LAKE AREA
1:50,000 SCALE.
FIG 3

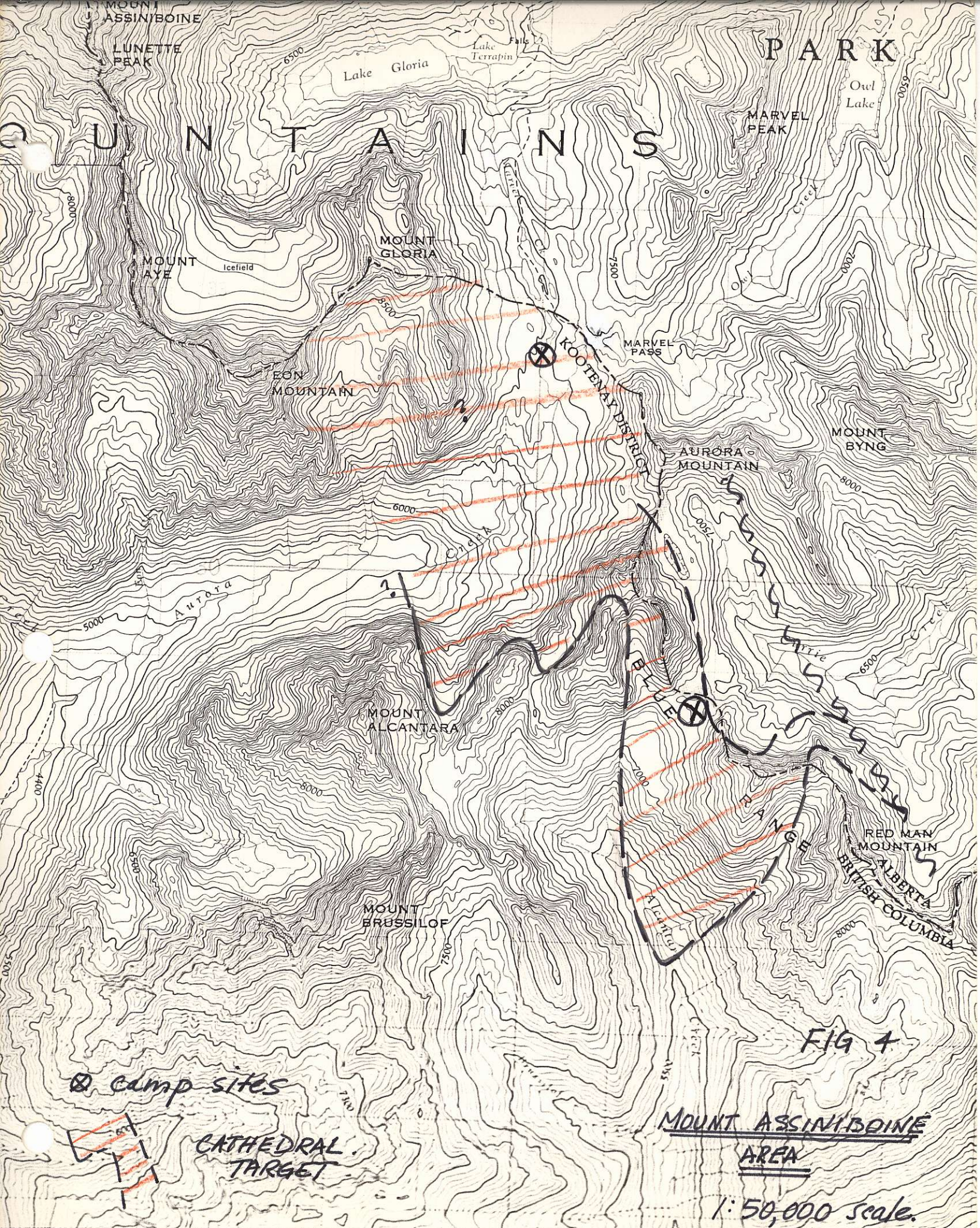


FIG 4

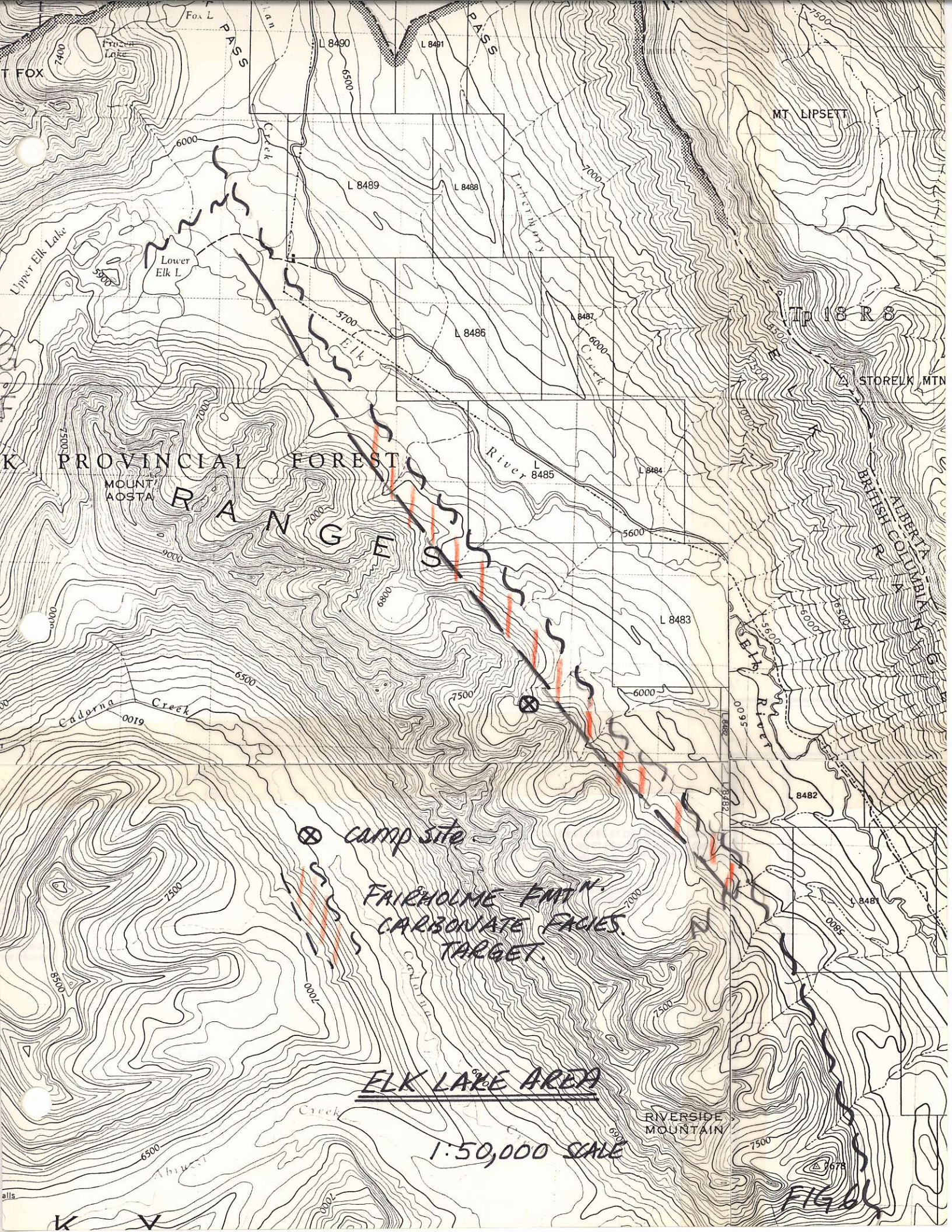
⊗ Camp sites

CATHEDRAL TARGET

MOUNT ASSINIBOINE AREA

1:50,000 scale.


ASSINIBOINE
THE MARSHALL 10465'
MT. STROM
MT. MAGOG 10050'
THE TOWERS 9337'
TERRAPIN MTN.
PARK
MT. STURDEE 10300'
MT. ASSINIBOINE 11870'
LUNETTE PK. 11150'
Lake Gloria
Lake Terrapin
Marvel L.
Quil Cr.
Bryant Cr.
NATIONAL
MARVEL PK.
MT. TURNER 9230'
MT. MORRISON
Assiniboine
Lunette
Lunette L.
AYE MTN. 10640'
MT. GLORIA
EON MTN. 10860'
MARVEL PASS
Mitchell
Eon Cr.
AURORA MTN.
MT. BYNG 9760'
Quil Creek
Currie Creek
MT. CURRIE 9268'
MT. ALCANTARA 9910'
Falls
Assiniboine River
Rapids
MT. BRUSSILOF 9990'
Alcantara Creek
Brussilof Cr.
REDMAN MTN.
WHITEMAN PASS
PARK
MT. WARRE
Wapta Cr.
Spray
Birdwood Cr.
MT. BIRDWOOD
GOVERNMENT
LAND
RESERVE
WHITEMAN MTN. 9763'
MT. LEFROY
SPRAY PASS
Leman L.
MT. LEMAN 8956'
MT. QUEEN ELIZABETH 9349'
Belgium
MT. KING ALBERT
PALLISER PASS 6836'
Back L.
Palliser L.
MT. BACK 9874'
MT. SODERHOLM 9682'
UEj
EOM
MILLER PASS
LOCKWOOD PK.
MT. BRADDOCK
Tangle Cr.
TANGLE PK. 9143'
Tipperary Cr.
Tipperary L.
MT. QUEEN MARY 10600'
MT. PRINCE JOHN
MT. PRINCE HENRY
8191'
8723'
Cascade
RANGES
MOUNTAINS
ROCKY
UEj - JUBILEE FMTN.
EOM - MCKAY GROUP
RUST STAINED AREAS IN CARBONATES OF JUBILEE FMT
MT SODERHOLME AREA
1" = 2 MI
FIG 5
To Banff — 48 miles
Vermilion Crossing
Vermilion River
93
116° 00'
To Radium Hot Springs — 34 miles
KOOTE
NATIONAL


Fox L
PASS
Frozen Lake
L 8490
L 8491
PASS
T FOX
MT LIPSETT
Creek
L 8489
L 8488
Upper Elk Lake
Lower Elk L
L 8486
L 8487
Elk
Creek
Tp 18 R 8
STORELK MTN
K PROVINCIAL FOREST
River
L 8485
L 8484
MOUNT AOSTA
RANGES
ALBERTA
BRITISH COLUMBIA
Elk River
L 8483
Caderna Creek
L 8482
camp site
FAIRHOLME FMTN.
CARBONATE FACIES.
TARGET.
ELK LAKE AREA
1:50,000 SCALE
RIVERSIDE MOUNTAIN
FIG 6

PROPOSED BUDGET: 6 week program

Manpower		
	1 geologist plus assistant salaries plus 25%	$ 3,750.00
Supervision		1,500.00
Room and Board		
	Motels - 2 weeks at $20.00	300.00
	Food	1,000.00
Transportation		
	Rental truck	1,500.00
	Helicopter - jet ranger @$330.00/hr. for 30 hours	10,000.00
Reports, maps, misc. field equipment		500.00
		18,550.00
Contingencies		1,450.00
		$20,000.00

APPENDIX 1

Description of Mineral Showings (locations on Fig. 1)

1) Monarch-Kicking Horse

This lead-zinc deposit was discovered in 1884 and mined in several stages till 1952. Yoho National Park now covers the area thus any further mining is prohibited. A total of 842,500 tons of ore grading 7% Pb, 10% Zn and 1.2 oz Ag were milled.

Mineralisation is confined to a 200' stratigraphic interval in the lower 400' of the Cathedral formation. Originally the host rock was thin bedded black limestone but now it is largely dolomitized. The ore bodies are all localized within a few feet of the base of a great westward pointing wedge of dolomite and they are aligned NW roughly parallel to major faults in the area. As well, a major facies change from shelf carbonates to basinal argillaceous limestones and shales taken place in the mine area parallel to the mineralization trend. Most of the mineralization occurs in breccia matrix but often pure sulphide veinlets are found associated with and cutting white dolomite veins. Locally there is a tendancy for ore to concentrate along the axes of minor folds, anticlines and synclines as well as intersection of both anti and synformal folds apparently coincide with mineralization. At the West Monarch there is pronounced dolomitization underneath the ore body.

From this description it is obvious that several potential ore controls exist. Knowing which of these or which combination of these elements is vital to ore deposition becomes a question of utmost importance for further prospecting.

Ney (1957) concluded that "linear zones of grey breccia" are the most important mineral control. He did not believe, however, that origin of the breccia zones was related to the same forces that produced the parallel and often coincident folds.

2) Eldon (See Fig. 2)

No published reports are available on this deposit but location is given on the 1:50,000 topographic map.

One disintegrated log cabin, complete with many rock specimens, was found on the trail about 1/4 mile from the workings. Prospecting must have been done at least 40 years ago.

The only showing found is on the N. side of a steep creek which drains to the E. Much mineralized debris has been blasted into the creek from the showing and from an adit about 50' beneath the showing.

Host rocks are sheared argillites and limy fine quartzite of the Precambrian Windermere series (Hector formation). Mineralization consisting mainly of chalcopyrite, galena sphalerite and pyrite is confined to a lense of quartz which cross cuts the bedding and shearing in the host rocks. At the thickest portion this lense may be 5' across. Along strike it is buried by overburden to the north and does not outcrop on the south side of the creek. It is unlikely that the lense is more than 50' long. Assays from hand samples of 20 - 30% combined Pb/Zn could be obtained but the average grade of the lense is more likely about 10 - 15% combined.

Geochemical samples were taken from the creek as shown on the attached sketch. Downstream dispersion is relatively good with the ratio between Cu and Zn remaining remarkably consistent. Acidity in this drainage would be higher than drainages which cut predominantly carbonate terrain. Therefore this dispersion should not be considered characteristic of the area.

3) Baker Creek

There are no published reports on this deposit but evidence from the old camp site indicates work took place at least 40 years ago.

Host rocks are the middle Cambrian Cathedral formation dolomites just above its base. This is similar to the Monarch-Kicking Horse horizon.

Mineralization consisting of malachite with traces of chalcopyrite and sphalerite is confined to a 10' - 20' wide quartz vein which trends $95^{\circ}/45^{\circ}S$. This cross cuts bedding and minor shearing in the dolomite. Numerous other narrow quartz veins and stockworks are also exposed but none of these carry mineralization.

A short adit was driven to intersect the vein structure but apparently stopped short. Minor "zebra" structures were prospected but I could find no positive indications of secondary zinc.

Origin of the vein material is probably the underlying Windermere quartzite which was mobilized up large fracture zones during folding.

4) Hawk Creek

This massive sphalerite showing was discovered in 1929 but was never developed because it lies within Kootenay National Park. Limited trenching exposes banded sphalerite over an average width of about 6' and along a horizontal distance of 80'. The northern end pinches to about 6" wide and the southern end is covered with overburden.

Limy argillite and limestone are the host rocks of uncertain age (possible U. Cambrian - Henderson). They are almost flat lying and are cut by a major shear zone trending NW.

Mineralization appears to have come along this shear until a favourable carbonate bed was encountered. Thus a thin pencil shaped zone was formed by replacement.

It is interesting to note that the showing lies directly on the hinge line in Mid-Cambrian, projected south from Monarch-Kicking Horse. The source of this zinc then might be a Mississippi Valley type deposit buried (stratigraphically) under the Hawk Creek deposit. Remobilization during faulting and folding would account for mineralization in its present position.

5) Silver Giant (Jubilee Mountain)

This property has not been described in the literature but was visited because lead was reported in Upper Cambrian Jubilee dolomite. DeKalb Mining published one drill intersection of 2.5% Pb over 60'.

The property lies on the E. flank of a NW plunging syncline. Upper Cambrian rocks are exposed over the entire claim group. These carbonate units are among the most westerly exposed and are presumed to be near the carbonate shelf edge during Upper Cambrian time.

Approximately 2500' of drill core is stored in a core shack near the main showing. The greatest proportion of this rock is light grey vuggy dolomite with calcite often partially filling the vugs. Several thin beds of graphite schist and dark grey fine grained argillite make up about 40% of the total. Not one trace of mineralization was found in over 500' of core that was examined.

The main surface showing contains coarse grained galena and secondary copper minerals in a 4' wide quartz vein which trends WNW and dips steeply (discordant). Host rocks are siliceous, massive dolomite surprisingly lacking in porosity in the form of vugs seen in the core. Average grade over the 4' vein is probably 5% Pb.

On the west side of Jubilee Mountain (the other limb of the syncline) barite is being mined.

The Silver Giant showings and drilling results are discouraging,however, the association of barite and galena in dolomite near the shelf edge indicates that the Jubilee formation has good potential.

APPENDIX 2

REGIONAL STRATIGRAPHY OF THE SOUTHERN CANADIAN ROCKY MOUNTAINS

Sedimentary rocks found in the southern Rock Mountains range in age from Proterozoic to Cretaceous. Paleozoic carbonates make up the core of these mountains, with some Proterozoic rocks exhumed along strike to the north and younger rocks exposed on top of the trust blocks in the eastern Rocky Mountains.

Throughout the Paleozoic, carbonate and fine-grained clastic sediments were deposited in a basin and shelf environment, which had an easterly source for the clastic detritus. During most of this time, the Purcell Arch formed a weak positive feature in southern British Columbia.

Cambrian rocks crop out in a semi-continuous belt with an average width of about 70 miles. West of the Rocky Mountain Trench, the Cambrian disappears under Carboniferous and Mesozoic rocks. To the east, Cambrian rocks crop out at the base of thrust scarps within the Front Range.

West of the Rocky Mountain Trench, the Lower and Middle Cambrian is found conformably upon the Proterozoic and forms an integral part of the same depositional sequence. Eastward, basal Cambrian quartzites cut abruptly into the underlying Proterozoic clastic rocks.

Shortly before the end of the Lower Cambrian, clastic deposition gave way to carbonate sedimentation, which continued into the Ordovician. No major unconformities are known to interupt these deposits, but a series of minor transgressions and regressions produced cyclic facies of thick carbonate units and thinly-bedded, dark-colored shales and carbonates. The Middle Cambrian best shows the facies change from shelf to basin. Massive shelf carbonate dominates the eastern part of the Rockies, whereas in the western part they give way to thinly-bedded basinal shale and carbonate.

Upper Ordovician sandstone and dolomite and succeeding Silurian dolomite and shale unconformably overlie the Middle Ordovician. Beneath the pre-Devonian unconformity, the Upper Ordovician is well developed only near Mount Wilson and Tipperary Lake; Silurian rocks are preserved only between Radium and the Top of the World.

In the southern Rockies, the Devonian truncates deeply into the underlying Paleozoic formations. In the Hughes and Standford Ranges, Middle Devonian dolomite and clastics grade laterally into gypsum. Upper Devonian biohermal carbonate and clastic megafacies conformably overlie these beds, but farther east, the Upper Devonian is found on Cambrian or Ordovician strata. Latest Upper Devonian sandstone and carbonates disconformably overlie the earlier Upper Devonian.

Throughout most of the Rocky Mountains, the Mississippian is truncated by Pre-Mesozoic erosion. Exposed Mississippian crinoidal carbonates, shales, evaporites, and red beds indicate a shallow water shelf or basin environment. Basinal, thinly-bedded argillaceous sediments are found westerly.

Disconformably overlying the Mississippian carbonates and disconformably underlying the Triassic in the southern Rocky Mountains are Pennsylvanian sandstone and dolomite succeeded by Permian phosphatic and cherty beds.

During the Mesozoic, orogeny in the western Cordillera produced landmasses and volcanic island arcs that supplied clastic detritus to the Rocky Mountain area. Triassic sediments were laid down in a shallow-marine, deltaic and restricted, shallow-marine, evaporite environments. Jurassic marine and non-marine clastics lie unconformably on eroded Triassic and Paleozoic rocks in southeastern British Columbia and southwestern Alberta. Cretaceous clastics transitionally overlie the Jurassic. These are best exposed in the Crowsnest Pass area and in the Foothills.