

COMINCO LTD.

EXPLORATION

WESTERN DISTRICT

GEOLOGICAL AND GEOCHEMICAL REPORT

SHA GROUP

Nelson and Fort Steele Mining Division, B.C.

N.T.S. 82F/1

Lat: 49°06'

Long: 116°17'

OWNER

COMINCO LTD.

Kootenay Exploration
1051 Industrial Road No. 2
Cranbrook, B.C.
VIC 4K7

Work Performed during June to December, 1982

Report by:

K.R. Pride
Geologist

APRIL 1983

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

11,210

**PART
2 OF 2**

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LIST OF CLAIMS

SHA GROUP

<u>CLAIM NO.</u>	<u>RECORD NO.</u>	<u>NO. OF UNITS</u>	<u>RECORDING DATE</u>
SHA 1	2679	8	June 24, 1982
SHA 2	2680	15	"
SHA 3	1628	12	June 18, 1982
SHA 4	1629	12	"
SHA 5	1630	15	"
SHA 6	1631	10	"
SHA 7	1632	15	"
SHA 8	1633	12	"

SHA Nos. 1 and 2 are located in Nelson M.D.

SHA Nos. 3 to 8 are located in Fort Steele M.D.

COMINCO LTD.

EXPLORATION

WESTERN DISTRICT

April 25, 1982

Geological and Geochemical Report

on the

SHA GROUP

Nelson and Fort Steele Mining Divisions, B.C.

INTRODUCTION

The SHA Group, totalling 99 units in 8 claims, was staked in June, 1982 to cover a section of the Middle Aldridge Formation clastic stratigraphy.

During 1982, Cominco Ltd. performed preliminary geological mapping and soil sampling on grids which were installed by a linecutting contractor. A total expenditure of \$22,011.00 was incurred during the period of June 25, 1982 to December 20, 1982.

Preliminary geological mapping at a scale of 1:10,000 was conducted over two grid areas established at the northern (Birch Creek grid) and the southern (Little Moyie River grid) portions of the claim group. Preliminary soil sampling obtained approximately 555 samples which were collected at 25 meter and 50 meter intervals along grid lines 300 and 400 meters apart on the Birch Creek grid and the Little Moyie River grid respectively.

LOCATION AND ACCESS

The SHA Group covers the drainage areas of Birch Creek, Carroll Creek and the Little Moyie River and is located approximately 25 kilometers east of Creston, B.C. between 2 and 13 km southeast of Kitchener on Highway No. 3. The center of the claim group is located at latitude 49°06'N and longitude 116°17'W. Field work on the SHA group was conducted from a five man base camp which utilized two 4x4 light duty trucks for transportation and mobilization.

REGIONAL GEOLOGY

The Sha property is located on the western side of the Purcell Anticlinorium, a broad north-plunging structure in Helikian and Hadrynian age rocks between the Foreland Thrust and Fold Belt to the east and the Kootenay Arc to the west. The Anticlinorium is transected by a number of steep longitudinal and transverse faults, namely the St. Mary and Moyie faults. The transverse faults appear to have been active intermittently since at least Hadrynian time (M. Lis & R. Price, 1976) and played an important role in controlling the type, distribution and thickness of late Proterozoic to early Paleozoic sediments (Hoy, 1980).

The oldest rocks of the Purcell Supergroup, exposed in the southwestern portion of Purcell Anticlinorium, are rusty-weathering wackes and quartzitic wackes of the Lower Aldridge Formation. They are overlain by about 3000 meters of quartzitic wacke turbidite beds and interbedded wackes of the Middle Aldridge Formation, and about 500 meters of thin-bedded, rusty-weathering argillite and wacke of the Upper Aldridge Formation. The overlying Creston Formation consists generally of shallow-water green and maroon wacke and argillite.

Moyie intrusions are found in all units of the Purcell Supergroup. They consist mainly of sills that range in thickness up to at least 100 meters, and are most common in the Lower Aldridge Formation. Sills occur most commonly in groups and consist of gabbro, metadiorite and metaquartz diorite. In these zones the enclosing sediments show contact metamorphism with well developed biotite and garnet.

GEOLOGY

Geological mapping at a scale of 1:10,000 was conducted over two grid areas. The Birch Creek grid was established on the northern portion of the claim group and the Little Moyie River grid was established on the southern portion of the claim group. The SHA Group is underlain by rocks of the Purcell Supergroup which includes the Lower, Middle, and Upper Aldridge Formations. The units strike between 150° and 170° and dip between 20° and 85° northeast. On the east boundary of the SHA Group, the Kid Creek fault, a northerly striking normal fault brings Lower Aldridge rocks on the eastern side in contact with Upper Aldridge rocks on the western down-dropped side. A number of Moyie sills occur within the upper part of the Lower Aldridge Formation and within the lower two thirds of the Middle Aldridge Formation.

Lower Aldridge Formation (4000+ m)

The Lower Aldridge rocks are characterized by thin-bedded wackes (1.2 cm - 7.5 cm) and thin bedded quartzitic-wackes less than 15 cm thick which weather rusty because of pyrrhotite and/or pyrite laminations which range from 1-10% by volume. The quartzitic wacke beds lack size grading and internal structure, but they grade compositionally upwards and downwards into the finer-grained wackes. Thick bedded and graded quartzitic wackes 1-4 meters thick occur approximately 300 meters below the top of the Lower Aldridge Formation. The upper portion of the section may include metagabbro sill-like intrusions. The rocks of the Lower Aldridge Formation, as indicated by the thin-bedded fine-grained wackes and the absence of cross-bedding in the quartzitic wackes suggest slow rates of sedimentation indicating a starved basin environment.

Middle Aldridge Formation (2100+ m)

The Middle Aldridge Formation is characterized by the occurrence of quartzitic wacke - wacke turbidites. The quartzitic wacke beds commonly show load casts, flame structures and flute casts. Turbidites show most commonly AE sequences (Bouma 1962), but also fairly commonly ABE, ACE and rarely ABCE sequences. Bedding in the quartzitic wackes ranges from a few centimeters to 2.0 m thick. Successions of thick-bedded quartzitic wacke with very thin black wacke interbeds alternate with thinner bedded quartzitic wacke sequences with a higher proportion of wacke and interbedded dark argillite. Throughout the Middle Aldridge Formation there is a decrease upwards in the thickness of the turbidite units, in the amount of turbidite and in the proportion of sand-sized fraction which suggests large scale fining-upward cycles which become transitional into the overlying Upper Aldridge Formation thin-bedded wackes and argillites.

Upper Aldridge Formation (300+ m)

The Upper Aldridge Formation consists of rusty weathering, thin-bedded, platy black argillite and wacke and is characterized by the absence of the turbidite units common to the Middle Aldridge Formation. The lower 150 meters consists of finely laminated argillite with very thin layers (1-2 mm) of grey to white weathering silt. This unit is known locally as "lined rock". The upper 150 meters consists of poorly bedded rusty-brown weathering to green-brown weathering argillite and wacke. These rocks are transitional into the overlying Creston Formation with the appearance of green and maroon argillites.

GEOCHEMISTRY

During the period June 25 to December 20, 1982 555 soil samples were collected on the SHA property. Two grids were soil sampled, namely the Birch Creek grid and the Little Moyie River grid. A linecutting contractor installed both grids which include cut base lines and cut cross lines. Chainage pickets were installed at 25 m intervals along the cross lines. Soil samples were collected at 25 m and 50 m intervals along cross lines which intersect the base line every 300 and 400 meters for the Birch Creek grid and Little Moyie River grid respectively.

Soil samples, where possible, were collected from the "B" horizon and packaged in kraft sample bags and sent to the Cominco Laboratory at 1486 East Pender Street, Vancouver, B.C. The soil samples were dried, sieved to -80 mesh, weighted to half a gram, digested in perchloric acid and analysed by atomic absorption for lead, zinc and arsenic. All sample pulps from the SHA Group are stored at the Cominco Laboratory in Vancouver, B.C.

Threshold values for lead, zinc and arsenic were calculated by cumulative frequency plots to distinguish the response of mineralization from the response of background and can be seen in TABLE 1. The results of the soil survey can be noted on the accompanying 1:10,000 scale maps, Plates 7 to 11. It should be noted that the arsenic values for the Little Moyie River grid were not plotted because virtually all the results were at or below the limits of detection.

TABLE 1

Geochemical Thresholds (ppm). Mean (\bar{x}) plus 2 standard deviations.

	Pb	Zn	As
Birch Creek grid	40	180	10
Little Moyie R. grid	25	150	2

The Birch Creek grid soil samples were collected at 25 meter intervals along cross lines which intersect the 1.5 km long base line every 300 meters. The results indicate that the lead values, ranging from 6 ppm to 103 ppm have a threshold value of 40 ppm. The zinc values, ranging from 47 ppm to 241 ppm have a threshold value of 180 ppm. The arsenic values range from 2 ppm to 35 ppm and have a threshold value of 10 ppm. The anomalous values obtained from the Birch Creek grid soil survey coincide with a large gabbro sill and associated quartz veins carrying specks of galena.

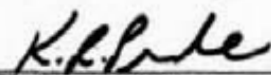
The Little Moyie River grid soil samples were collected at 50 meter intervals along cross lines which intersect the 2.7 km long base line every 400 meters. The results indicate that the lead values, ranging from 6 ppm to 54 ppm, have a threshold value of 25 ppm. The zinc values, ranging from 29 ppm to 431 ppm, have a threshold value of 150 ppm. The arsenic values were all at or below the limit of detection. The anomalous values obtained from the Little Moyie River grid soil survey coincide with finely laminated wacke and argillite units characteristic of the Upper Aldridge Formation and probably represent a high background Pb-Zn content commonly found in fine clastic sediments of a restricted basin environment.

CONCLUSIONS

Results of the preliminary 1:10,000 scale geological mapping on the SHA Group have outlined the Lower, Middle and Upper Aldridge Formations but failed to locate stratiform lead-zinc sulphide mineralization.

Results of the preliminary grid soil sampling have outlined small isolated or "spot" anomalies which can be attributed to intrusive gabbro sills in the case of the Birch Creek grid and to finely laminated wacke and argillite units of the Middle and Upper Aldridge Formations in the case of the Little Moyie River grid.

Report by:



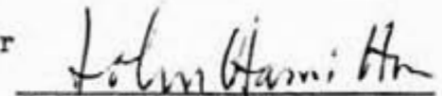
K.R. PRIDE
Geologist

Endorsed by:



D. ANDERSON, P.Eng.
Project Geologist

Approved for
Release by:



J.M. HAMILTON, P.Eng.
Chief Geologist
Kimberley

Endorsed by:



G. HARDEN
Manager, Exploration
Western District
Vancouver

Copies:

Mining Recorder (3 copies) ✓
Western District, Exploration
Kootenay Exploration

REFERENCES

- Hoy, T., 1980 Stratigraphic and Structural setting
of Stratabound Lead-Zinc Deposits in
Southeastern, B.C. 5th Annual CIM
District 6 meeting, Kimberley, B.C.,
October, 24, 1980.
- Reesor, J.E., Geology of the Lardeau map-area east
1973 half, B.C. G.S.C. Memoir 369.
- Bouma, A.H., Sedimentology of Some Flysch Deposits:
1962 Elsevier, Amsterdam, 168 p.

APPENDIX "A"

STATEMENT OF EXPENDITURES

SHA CLAIM GROUP

JUNE 25TH TO DECEMBER 20TH, 1982

SALARIES

K.R. Pride	- 29 days @ \$193/day	\$ 5,597.00
G.M. Chesham	- 3 days @ \$70/day	210.00
D.E. MacDonald	- 2 days @ \$70/day	140.00
L.J. Molnar	- 3 days @ \$70/day	210.00
B.P. Smith	- 2 days @ \$70/day	140.00
		<u>\$ 6,297.00</u>

GEOCHEMICAL ANALYSIS

Soil samples - 555 @ \$6.35/sample \$ 3,524.25

LINECUTTING

O'Grady, Frank - 25.84 km @ \$300/km \$ 7,752.00

TRANSPORTATION

Truck - 4x4 - Fuel \$ 510.00

Total direct field costs \$18,083.25

REPORT WRITING, RESEARCH, DRAFTING

K.R. Pride - 7 days @ \$193/day	\$ 1,351.00
Pacific Survey - Pencil Manuscript	<u>2,577.00</u>
	\$ 3,928.00

TOTAL COST \$22,011.25

Linecutting - \$ 7,752.00
Geology & Geochem 14,259.25
\$22,011.25


K.R. PRIDE, Geologist

APPENDIX "B"

IN THE MATTER OF A GEOLOGICAL AND GEOCHEMICAL
PROGRAM PERFORMED ON THE SHA CLAIM GROUP
NELSON AND FORT STEELE MINING DIVISION
BRITISH COLUMBIA

A F F I D A V I T

I, K.R. PRIDE OF THE MUNICIPALITY OF BURNABY, IN THE PROVINCE OF BRITISH COLUMBIA, HEREBY DECLARE:-

- (1) THAT I am employed as a geologist by Cominco Ltd., and, as such, have a personal knowledge of the facts to which I hereinafter depose;
- (2) THAT annexed hereto and marked as APPENDIX "A" to this report is a true copy of expenditures incurred in connection with a geological and geochemical program on the Sha Claim Group;
- (3) THAT the said expenditures were incurred between the 25th day of June and the 20th day of December, 1982 for the purpose of performing geological and geochemical exploration on the Sha Claim Group.

Signed: K.R. Pride
K.R. Pride
Geologist

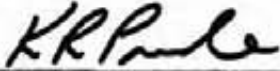
APPENDIX "C"

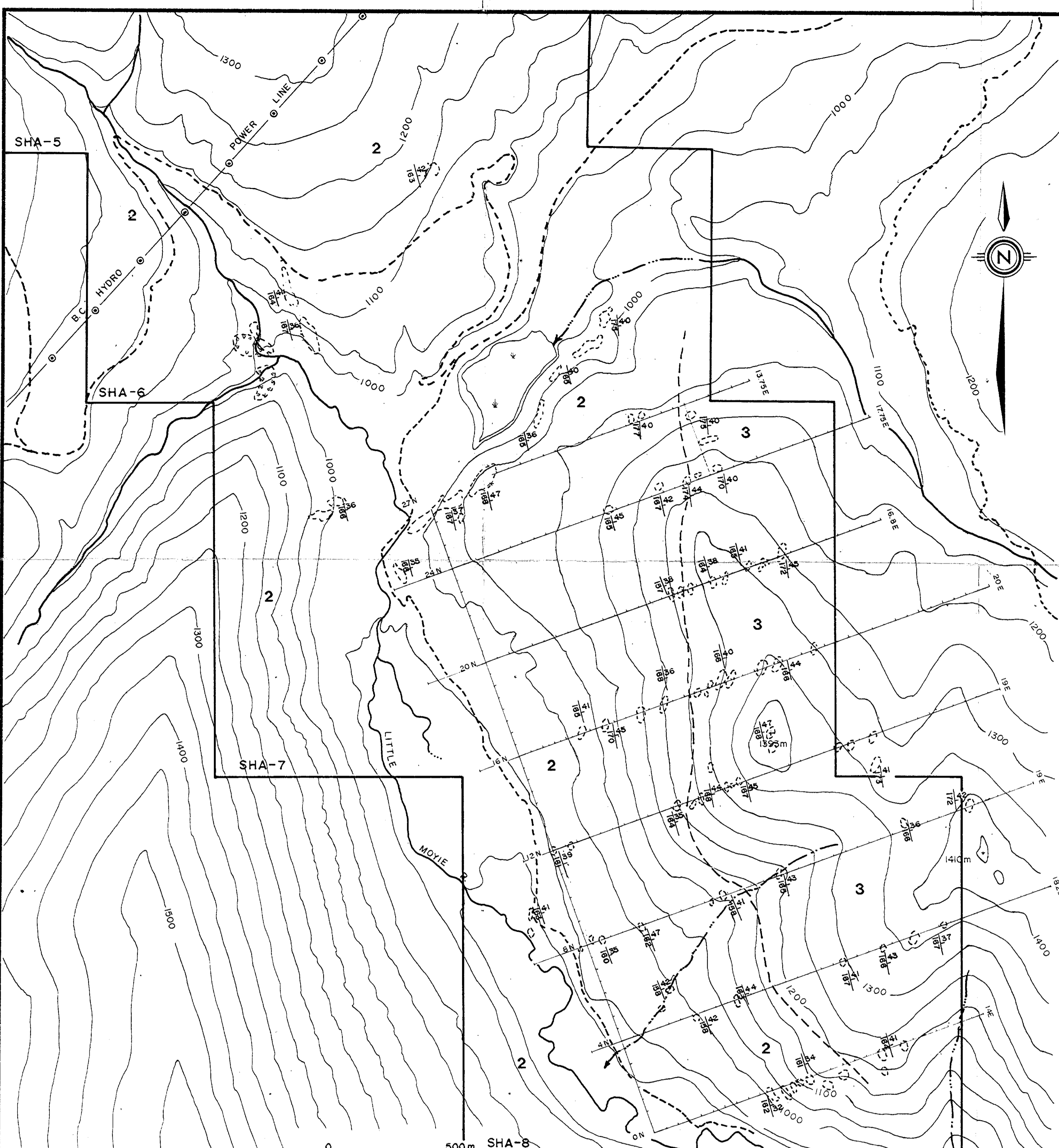
STATEMENT OF QUALIFICATIONS

I, K.R. PRIDE, GEOLOGIST, WITH BUSINESS ADDRESS AT 700-409 GRANVILLE STREET, VANCOUVER, BRITISH COLUMBIA AND RESIDENTIAL ADDRESS AT 3770 FIR STREET, BURNABY, BRITISH COLUMBIA, HEREBY CERTIFY:-

- (1) THAT I am a graduate in Geological Sciences with a B.Sc. (Hons.) in 1973 from the University of British Columbia.
- (2) THAT from 1973 to the present I have been employed by Cominco Ltd. as a geologist and have been actively engaged in mineral exploration in British Columbia, Yukon, Northwest Territories.
- (3) THAT I personally participated in the field work on the Sha Claim Group and have interpreted all the data resulting from this work.

Signed:


K.R. Pride
Geologist



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LEGEND

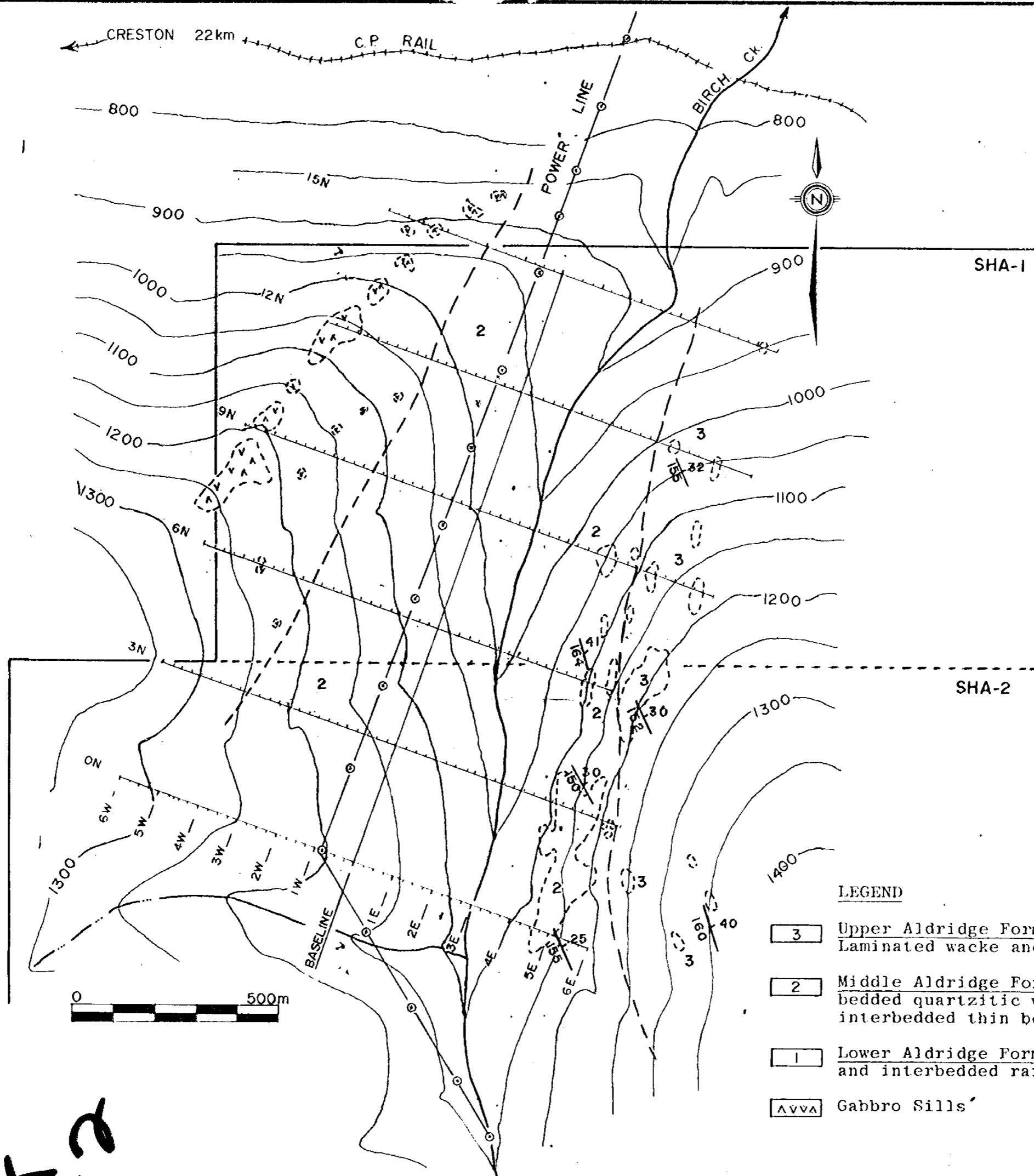
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- 2 Middle Aldridge Formation; Medium to thick bedded quartzitic wacke-wacke turbidites with interbedded thin bedded wacke and argillite
- 1 Lower Aldridge Formation; Thin bedded wacke and interbedded rare quartzitic wacke
- AVVA Gabbro Sills
- Rock outcrop
- + / / Bedding (horizontal, inclined, vertical)
- Geological Contact (defined, approximate, assumed)
- ~ ~ ~ ~ ~ Fault (defined approximate, assumed) (solid circle indicates downthrow side, arrows indicate relative movement)
- + - - - - Anticline (defined, approximate)
- - - - - Syncline (defined, approximate)
- + - - - - Anticline or syncline (overturned)
- 2 Drag-fold (arrow indicates plunge)

SHA PROPERTY				82 F/1
Drawn by: KRP		Traced by:		
Revised by	Date	Revised by	Date	
LITTLE MOYIE RIVER GRID GEOLOGY			Plate: 6	
Scale: 1:10,000		Date: AUG. 1982		

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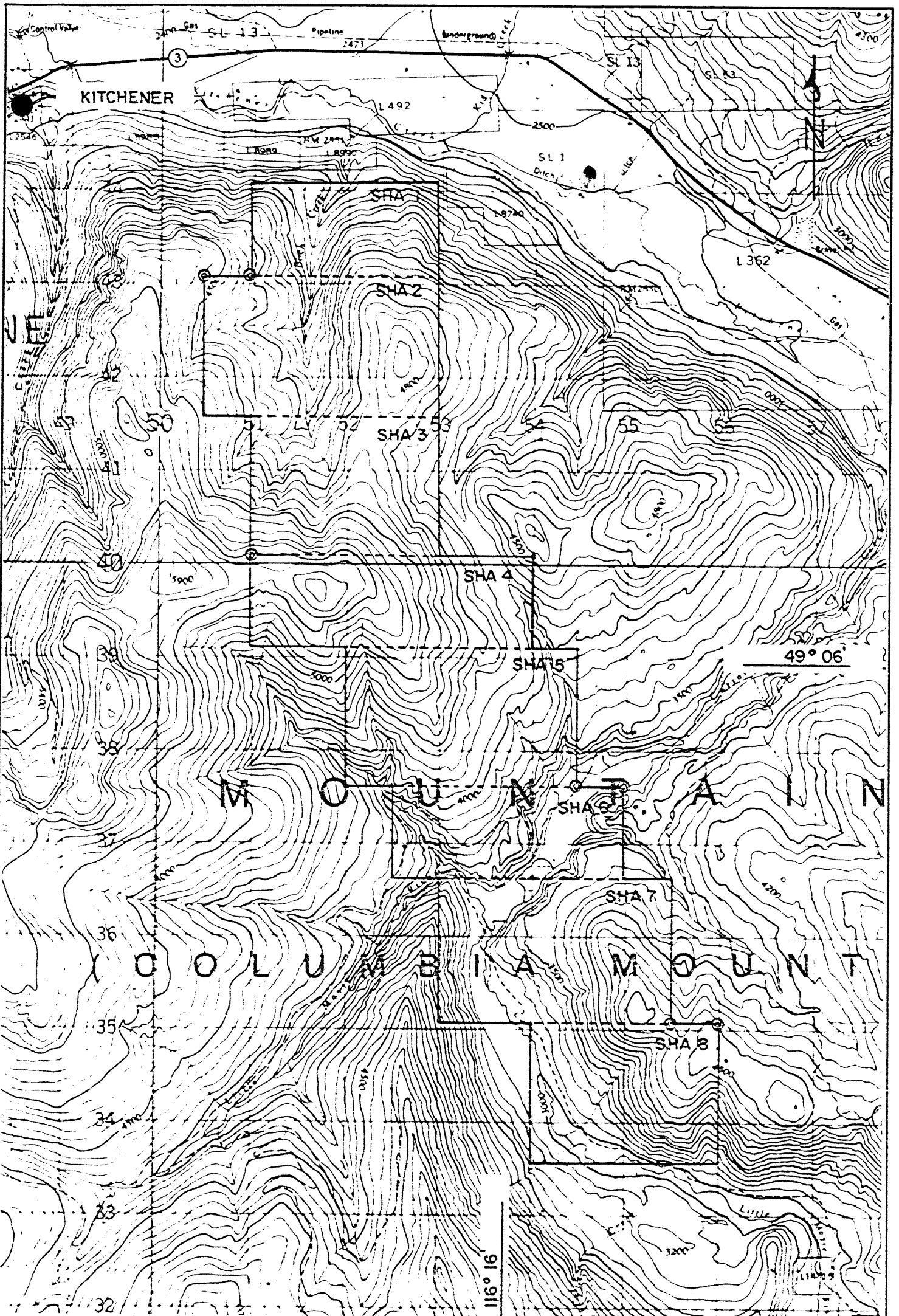
PART
2 OF 2



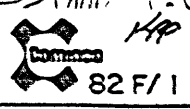
LEGEND

- 3 Upper Aldridge Formation; Thin bedded-parallel Laminated wacke and argillite.
- 2 Middle Aldridge Formation; Medium to thick bedded quartzitic wacke-wacke turbidites with interbedded thin bedded wacke and argillite.
- 1 Lower Aldridge Formation; Thin bedded wacke and interbedded rare quartzitic wacke.
- AVVA Gabbro Sills

SHA PROPERTY				82.F/1	
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Revised by	Date	Revised by	Date		
				GEOLOGY	
				Scale: 1:10,000	Date: AUG., 1982
					Plate: 5



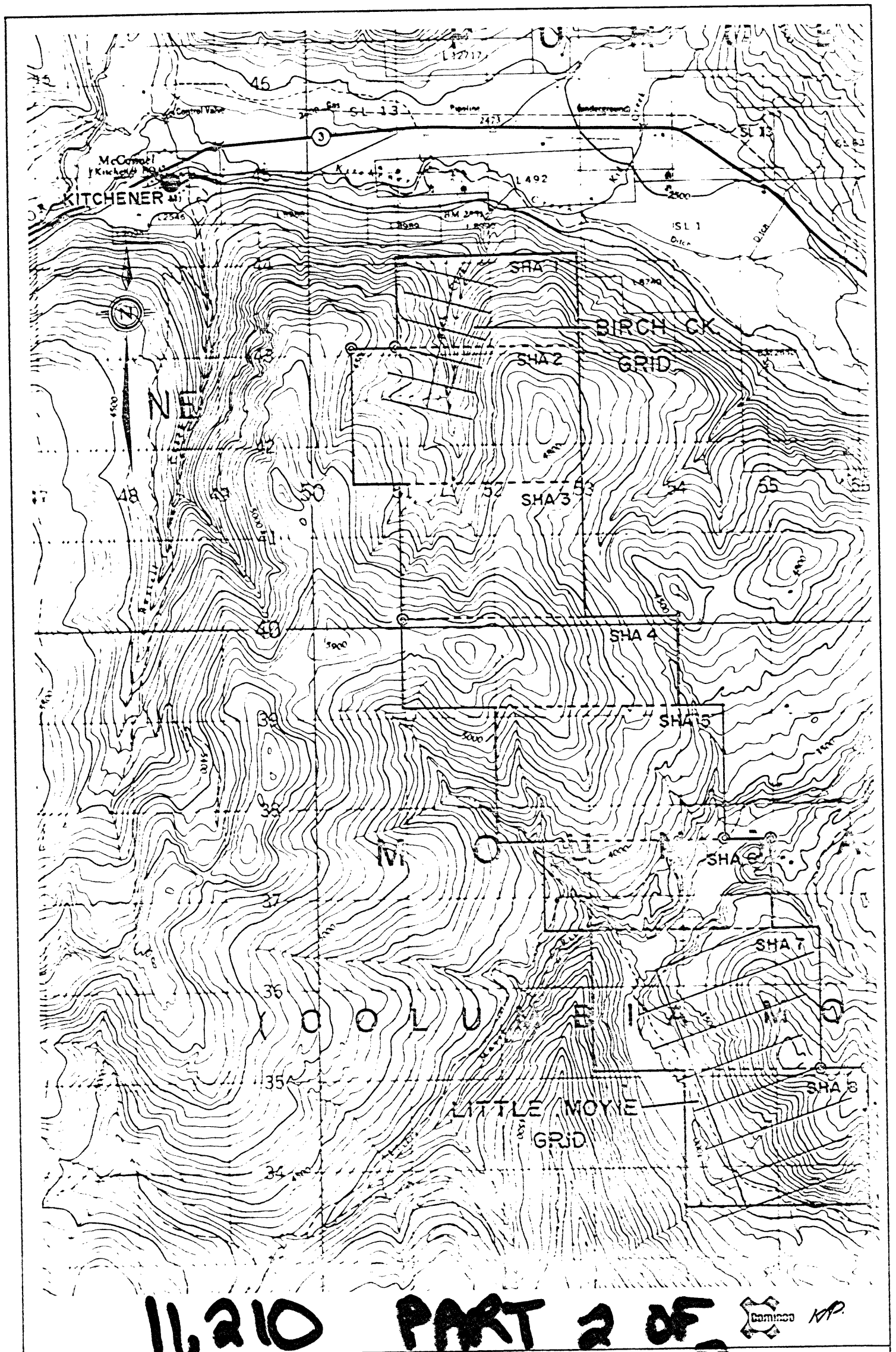
11,210 PART 2 OF 2



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SHA GROUP CLAIMS

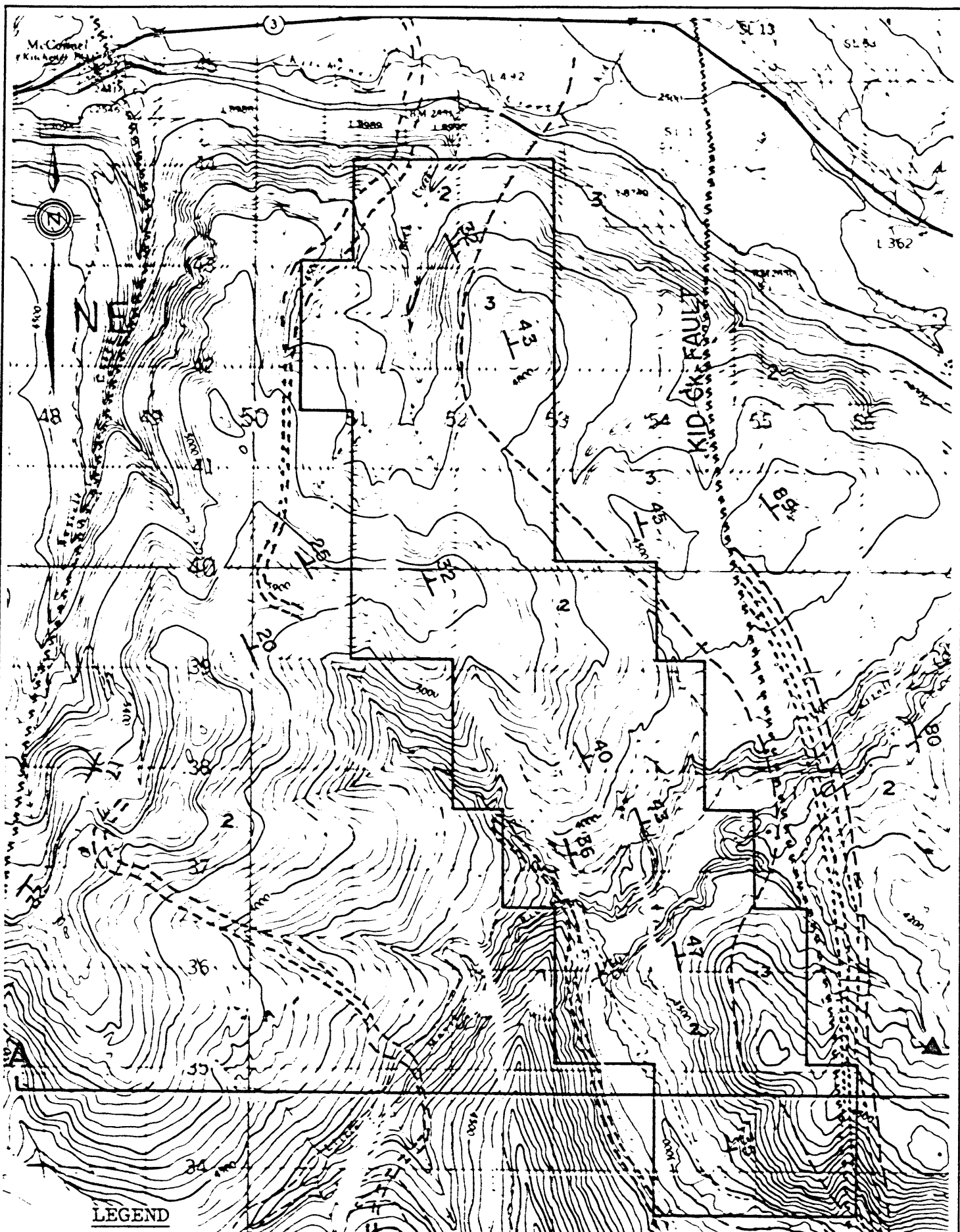
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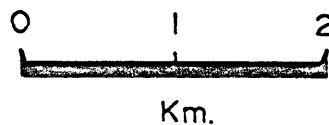
GRID LOCATION MAP

Scale: 1:50,000 Date: DEC, 1982 Plate: 3



LEGEND

- 3** Upper Aldridge Formation; Thin bedded-parallel laminated wacke and argillite.
- 2** Middle Aldridge Formation; Medium to thick bedded quartzitic wacke-wacke turbidites with interbedded thin bedded wacke and argillite.
- 1** Lower Aldridge Formation; Thin bedded wacke and interbedded rare quartzitic wacke.
- YAVA** Gabbro Sills



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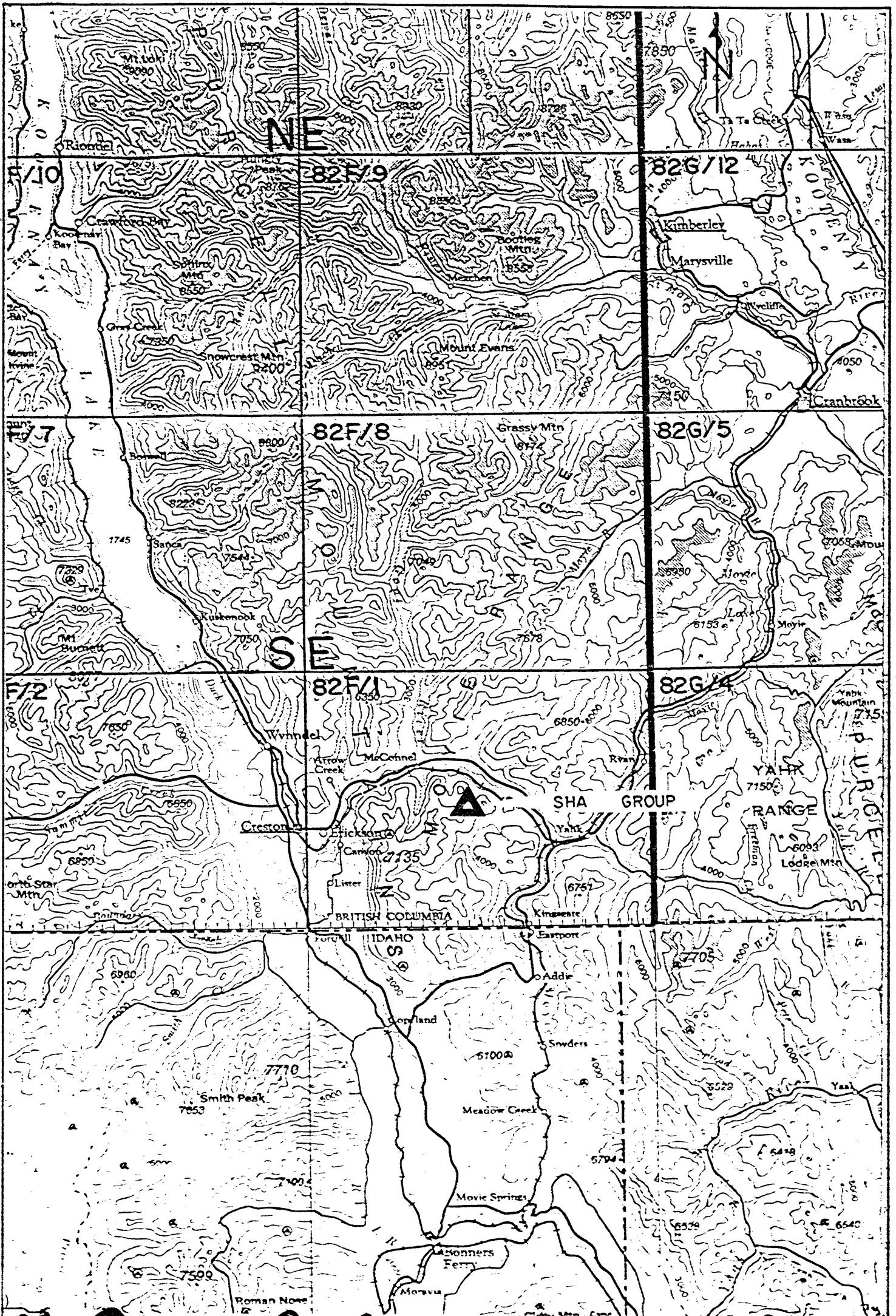
SHA GROUP REGIONAL GEOLOGY

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Revised by	Date	Revised by	Date

Scale: 1:50,000

Date: DEC. 1982

Plate: 4



11,210 PART 2 OF 2 *KRP*

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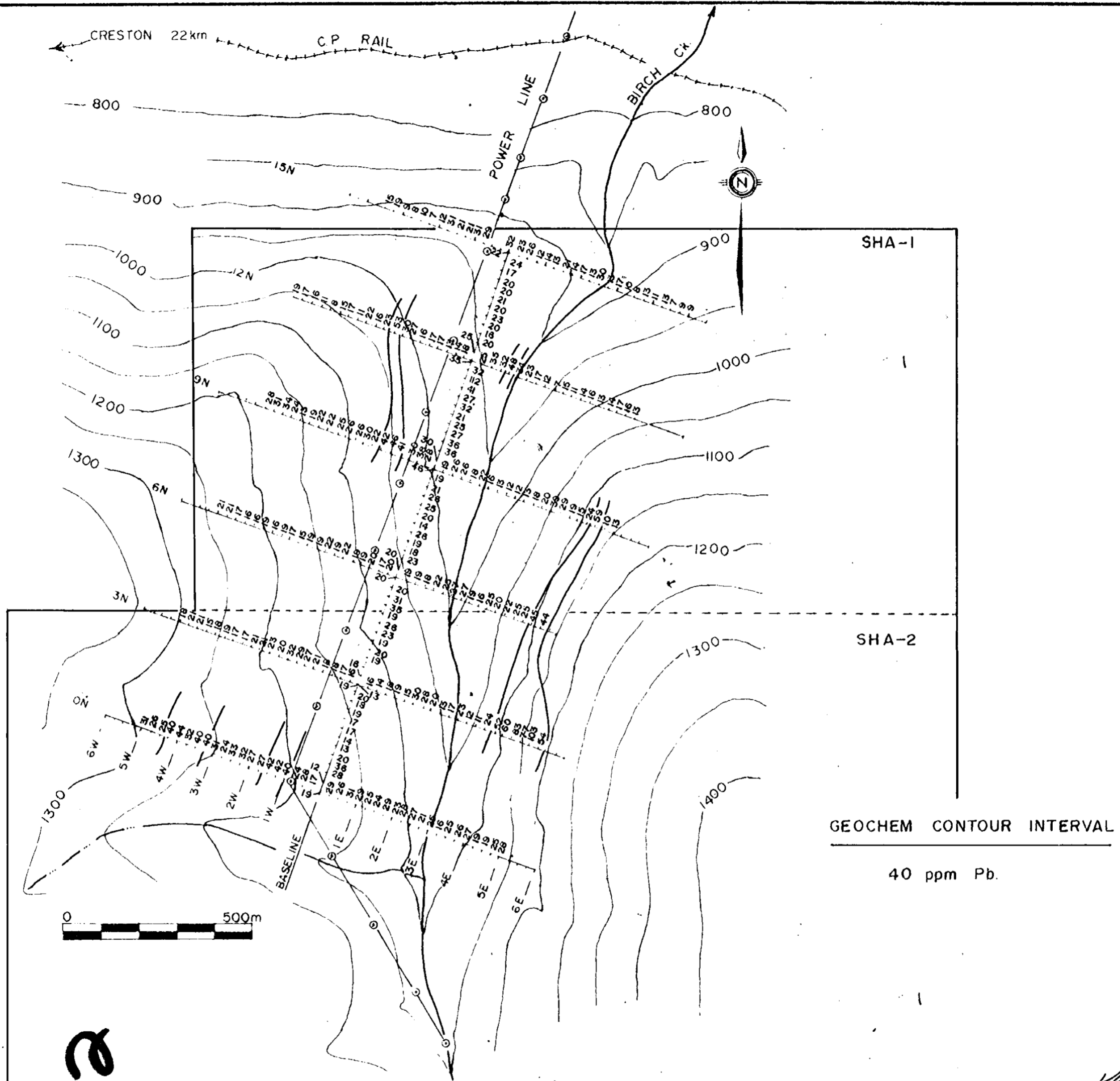
SHA GROUP


LOCATION MAP

Scale: 1: 500,000 Date: JUNE 21, 1962 Plate: 1

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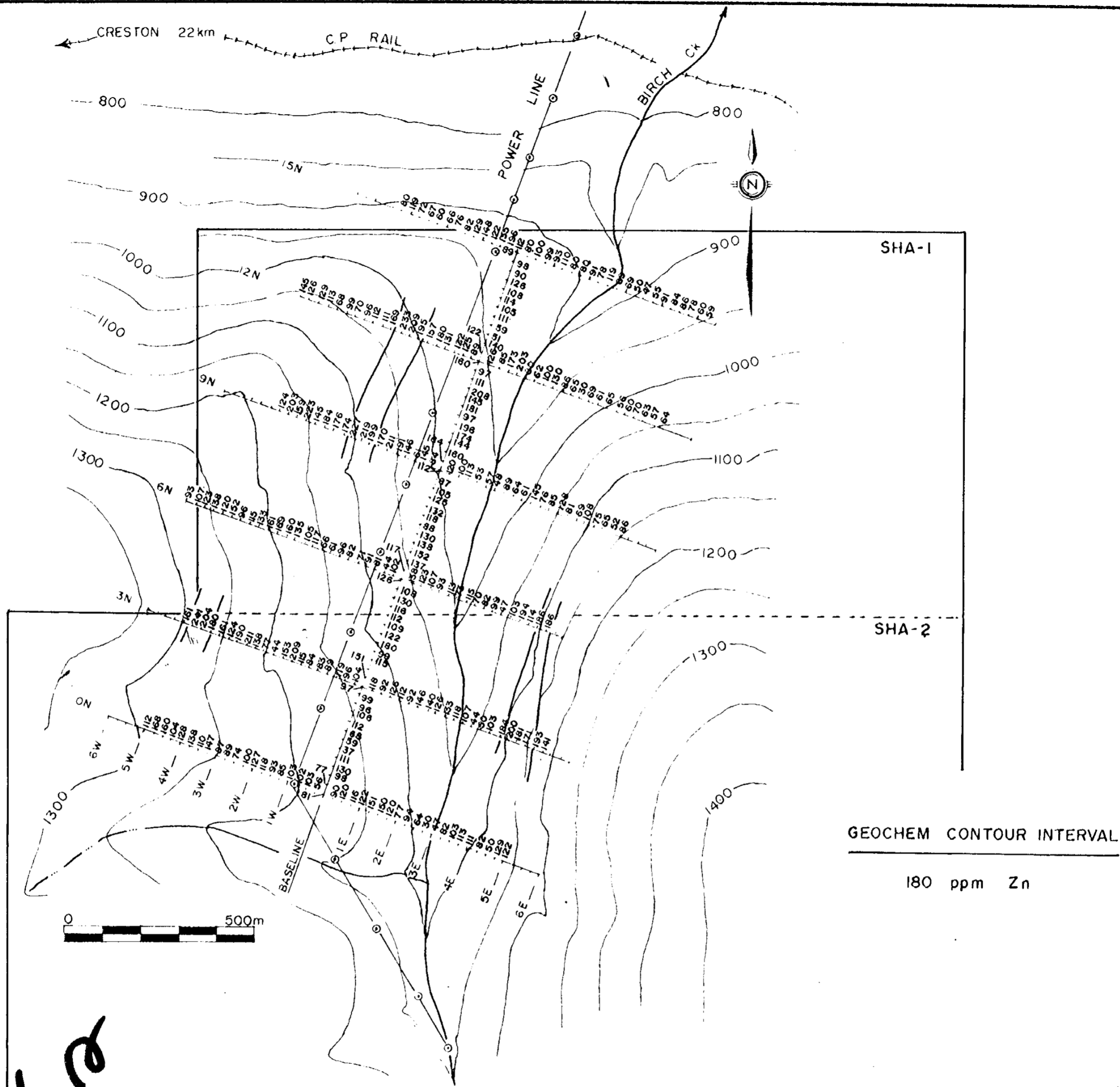


SHA PROPERTY				 82 F/1
BIRCH CREEK GRID				
Pb. (ppm)				
Drawn by: KRP	Traced by:			Scale: 1:10,000
Revised by	Date	Revised by	Date	
				Date: AUG, 1982
				Plate: 7

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SHA PROPERTY

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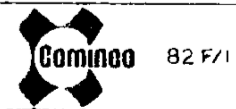
BIRCH CREEK GRID

Zn (ppm)

Scale: 1:10,000

Date: AUG, 1982

Plate: 8

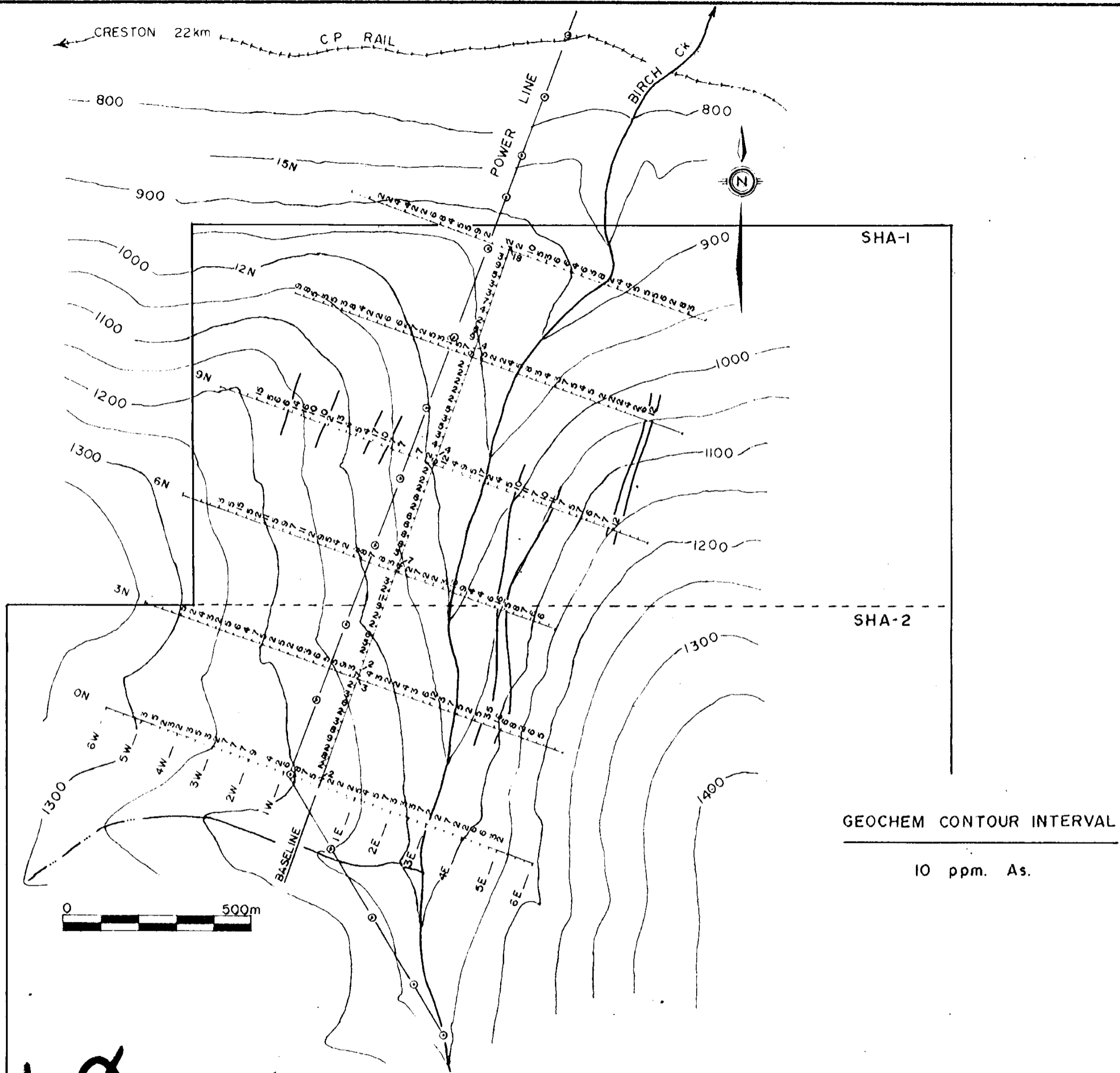


82 F/1

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GEOCHEM CONTOUR INTERVAL

10 ppm. As.

SHA PROPERTY

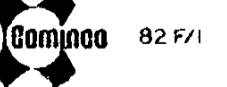
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Revised by: Date	Revised by: Date

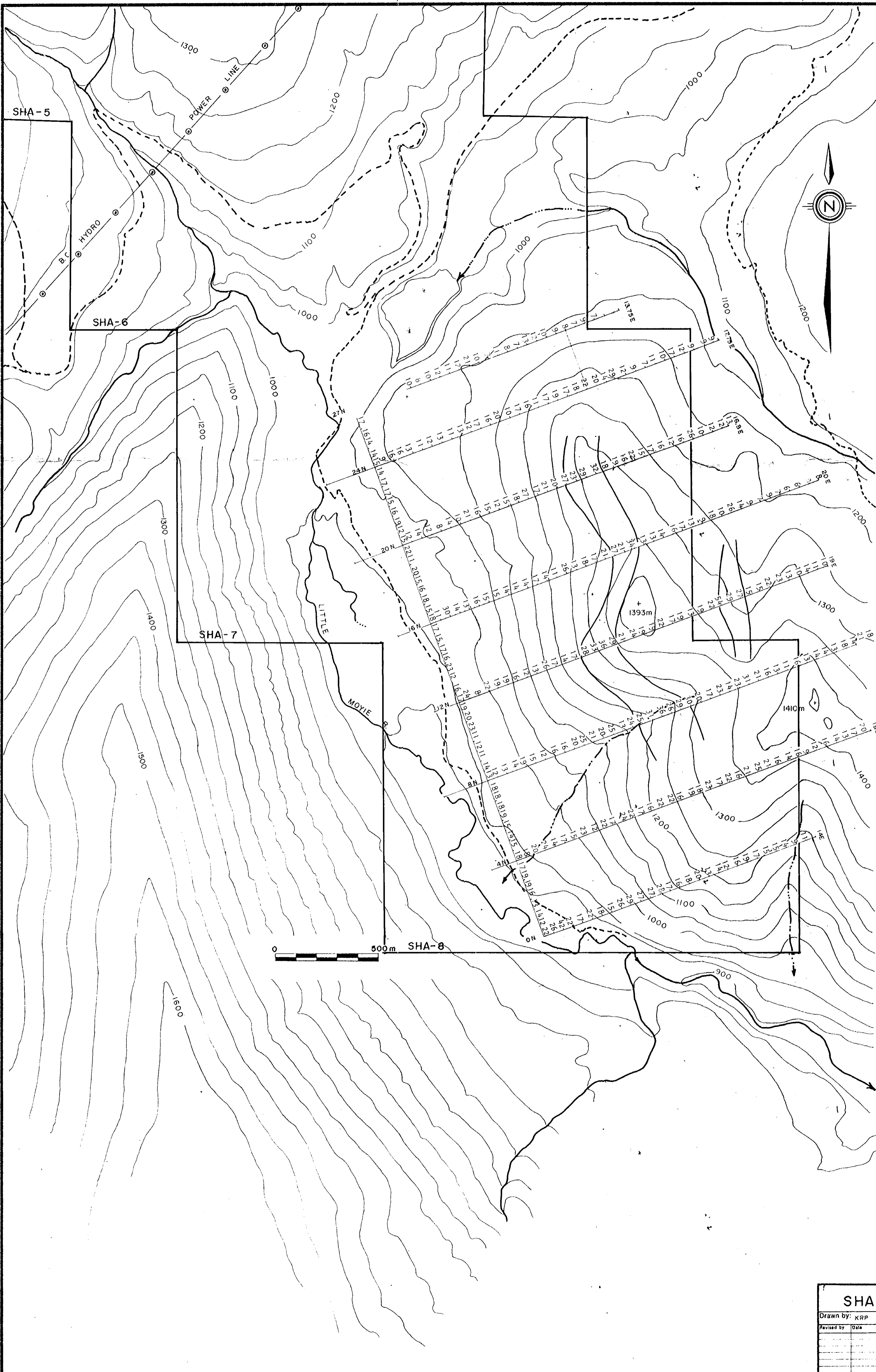
BIRCH CREEK GRID
As (ppm)

Scale: 1:10,000

Date: AUG, 1982

Plate: 9





GEOCHEM CONTOUR INTERVAL

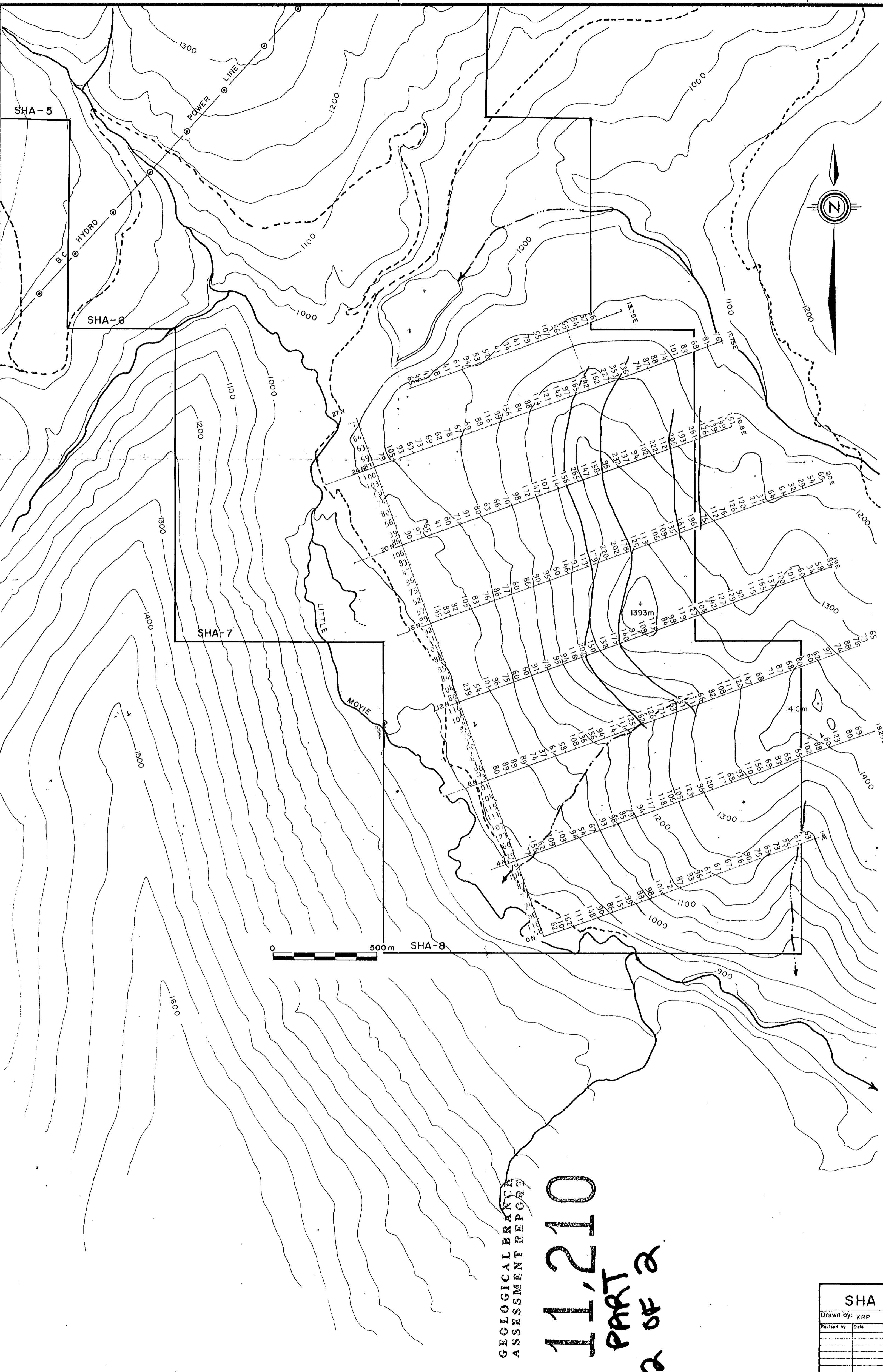
25 (ppm) Pb.

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SHA PROPERTY		LITTLE MOYIE RIVER GRID	
Pb. (ppm)		Pb. (ppm)	
Drawn by: KRP	Traced by:	Scale: 1:10,000	Date: AUG. 1982
Revised by:	Date:	Plate: 10	



GEOCHEM CONTOUR INTERVAL
 150 (ppm) Zn.

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SHA PROPERTY		KRP 82 F/1	
Drawn by: KRP	Traced by:	LITTLE MOYIE RIVER GRID	
Revised by:	Date:	Zn. (ppm)	
		Scale: 1:10,000	Date: AUG. 1982
			Plate: 11