

800561

SAGE CREEK COPPER PROSPECT

Fort Steele Mining Division

Submitted to

MARK V MINES LTD. (N.P.L.)

Vancouver, B.C.

December 15, 1969

A.R. Bullis, P. Eng.

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SAGE CREEK COPPER PROSPECT

INTRODUCTION

Mark V Mines Ltd. (N.P.L.) have acquired a mineral property in the south-east corner of British Columbia. The property is in an area which is extremely rugged, typical of the front ranges of the Rocky Mountains.

The author visited the location on two occasions in September and October of 1969, in order to investigate the reports of copper mineralization in the Grinnell Formation. The area was staked after the initial field investigation, partially as a result of observation made at the time and also from the knowledge that Bear Creek Mining Company have a copper prospect under investigation at Mount Vernon, Montana. The Mount Vernon property is located within the Troy Quartzite formation which is the continuation of the Grinnell Formation in Montana. No information is available to the author as to grade or tonnage potential at Mount Vernon.

RECOMMENDATIONS

South-eastern British Columbia is an area in which only cursory prospecting for copper has been done in the past, and therefore, it will be necessary to explore the favorable Grinnell Formation along the entire length of the exposed outcrop. Any copper mineralization discovered during the prospecting stage will require additional exploration to prove the worth of the discovery. The author recommends that a geological map be prepared of the area with particular emphasis placed on any areas of copper mineralization, especially in white quartzite strata, within the Grinnell Formation.

To facilitate exploration in areas covered with soil, where copper mineralization is known or suspected, a soil-sampling programme should be conducted in conjunction with the geological mapping.

Any areas of copper mineralization or anomalous zones of copper in overburden should be stripped and trenched. A contingency for a limited drilling programme should be provided to test good copper bearing zones.

Because the terrain is extremely rugged, the author recommends the use of a helicopter to transport prospecting and mapping crews.

COST OF PROGRAMME

1.	Prospecting		
	Four men for two months	\$	6,000.00
2.	Geological Mapping		
	Two men for three months		6,000.00
3.	Soil-Sampling		
	and/or rock sampling		6,000.00
4.	Stripping & trenching		
	200 hrs. @ \$25.00	\$	5,000.00
	3 men for one month		2,000.00
	Transportation	1,500.00	8,500.00
5.	Supervision, assaying etc.		4,000.00
6.	Helicopter transportation		2,000.00
7.	Contingency for drilling		
	1000 ft. @ \$10.00 / ft.		10,000.00
			<hr/>
	Sub Total	\$	44,500.00
	Contingency		5,500.00
			<hr/>
	Grand Total	\$	50,000.00
			<hr/> <hr/>

Respectfully submitted,

A.R. Bullis

A.R. Bullis, P. Eng.

A.R. Bullis

December 15, 1969

PROPERTY

The claims were staked by Allen McLean during the period from the 18th to 26th October, 1969. The claims are named ABC 1 to 4, inclusive and ABC 11 to 34, inclusive. The property consists therefore, of twenty-eight claims held by location.

LOCATION & ACCESS

The area is located in the Fort Steele Mining Division in the south-east corner of British Columbia. Sage Creek is a tributary of the Flathead River. The area is accessible via the forest access road which is located in the Flathead River Valley and which connects with Highway 97 near Michel, B.C. A number of good roads lead from the forest access road up the various creek valleys in the area.

The coordinates of the center of the claim block are approximately 49° 10' North Latitude and 114° 15' West Longitude.

TOPOGRAPHY

The area is an extremely rugged alpine district typical of the Rocky Mountains in the vicinity of Waterton Lakes National Park. Alpine glaciation has sculptured the mountains into steep-walled peaks and valleys. The Flathead River Valley is at a base level of 4,600 feet and peaks in the vicinity of Sage Creek range in elevation from eight to nine thousand feet above sea level.

TOPOGRAPHY - cont'd.

Timber is sparse above the 6,500 foot contour; most peaks and ridges are bare rock with some grass and alpine vegetation wherever the soil clings to the slopes.

The climate is continental with moderate rainfall; winds can be a problem on the higher areas where prevailing westerlies frequently reach velocities of 30 m.p.h. in gusts.

REGIONAL GEOLOGY

The bedrock in this area of the Rocky Mountains is composed of folded strata that have been displaced by major thrust faults. The region east of the Flathead River is largely underlain by members and formations of the Purcell rocks of Pre-Cambrian age. Most of the Purcell Formation is comprised of argillite, impure limestone and dolomite, siltstone sandstone and quartzites with some members of andesite lavas. The sediments apparently accumulated in shallow marine conditions where ripple-marks and sun-cracks were common. The oxidizing conditions are apparent in some formations where reddish argillites and siltstones are common. The regional structure, apart from the many thrust faults, is a large folded "basin" that outcrops on both the British Columbia and Alberta sides of the Rocky Mountains, east of the Flathead River valley.

The various formations can be traced with considerable ease where they outcrop on the western side of the mountain range.

COPPER IN THE GRINNELL FORMATION

The Grinnell Formation is part of the Purcell Series of Pre-Cambrian age which overlies a thick mass of highly siliceous dark-grey sediments, called the Appehunny Formation, and which in turn is overlain by a formation of massive grey, fine-crystalline dolomite and sandy dolomite with some red, green and black argillite, called the Siyeh Formation.

The Grinnell Formation itself is comprised of bright red argillite and coarse-grained white quartzite. Ripple-marks are common on the quartzites and mud-crack surfaces characterizes the argillite beds. The Grinnell sediments are typical of sediments that have accumulated in shallow seas under strongly oxidizing conditions.

The copper sulfide, bornite and possibly chalcocite, was found within the red argillite beds, especially where thin-bedded quartzite lenses and grey argillites occur in the red-beds. The author cannot be certain that the copper found in the Grinnell Formation is of sedimentary origin, but it has been found in a number of places along the strata of the Grinnell Formation and this, coupled with the apparent lack of a near intrusive origin for the sulfides, points to the possibility that the copper is of sedimentary origin.

SHOWINGS

The author examined a large shallow trend blasted across the formation near the Sage Creek Road. The rock here

SHOWINGS - cont'd.

• is mainly red argillite with 10% to 15% grey-green argillite, or fine-grained quartzite. There are, in addition, several thin white quartzite members, which contain visible bornite and chalcocite. The red and grey-green argillite may be mineralized but, if so, the mineralization is so finely-divided that it is not readily apparent.

SIGNIFICANCE OF COPPER

Sedimentary copper deposits are not common, but wherever they are found they constitute a major ore reserve. A sedimentary accumulation can be very widespread throughout the formation in which the copper occurs. If this is the case in the Grinnell Formation, then copper mineralization over a considerable area may be found in the vicinity of the Flathead Valley.

Respectfully submitted,

A.R. Bullis

A.R. Bullis, P. Eng.

A.R. Bullis

CERTIFICATE OF QUALIFICATIONS

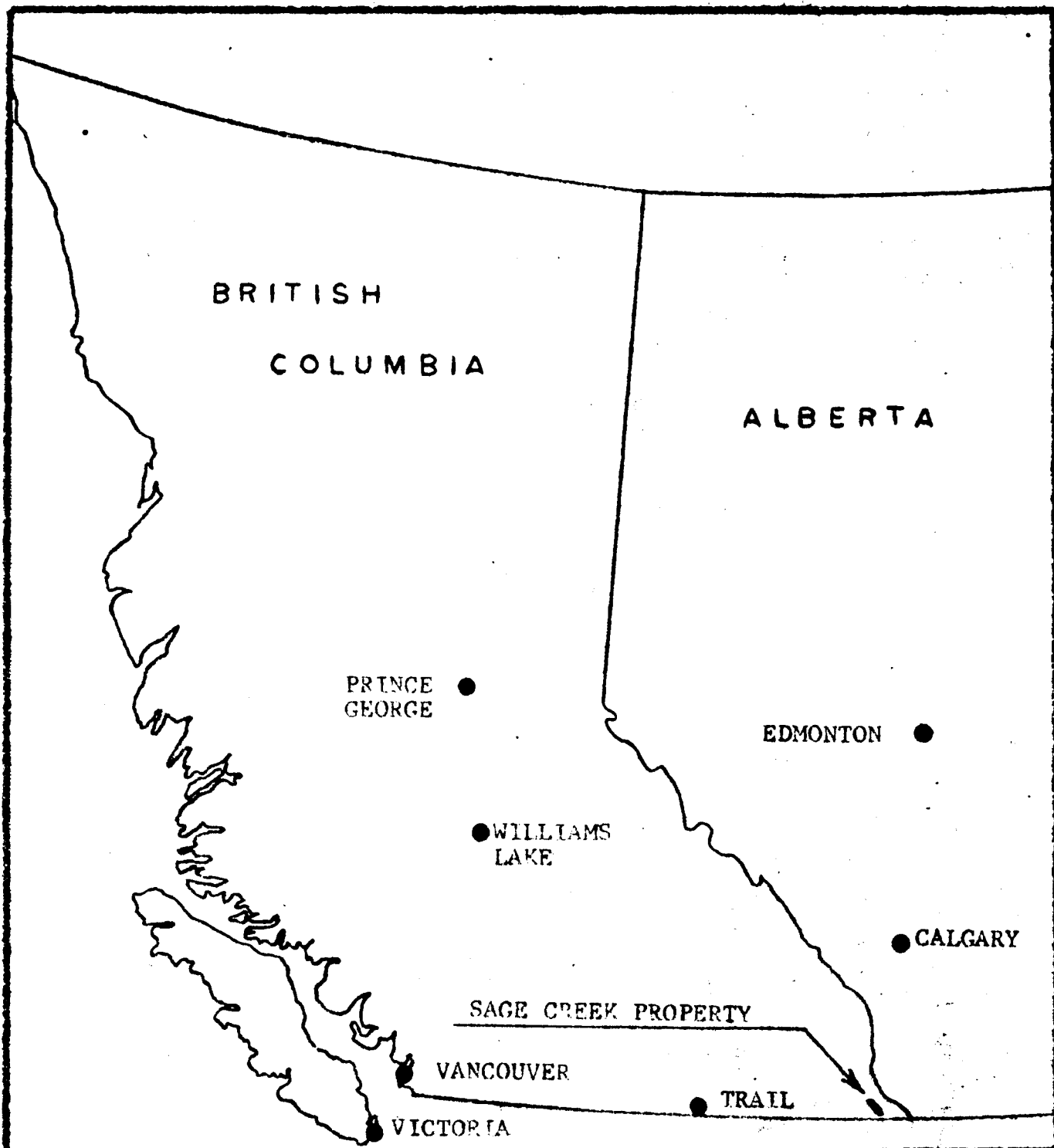
- I, Albert Ralph Bullis, do hereby certify that:
1. I am a practising geological engineer with residence at 5215 Saratoga Drive, Delta, B.C.
 2. I am a graduate of the University of British Columbia and have been granted the degree of Bachelor of Applied Science.
 3. I have been practising my profession as a geological engineer for sixteen years.
 4. I am a member of the Association of Professional Engineers of British Columbia and a member of the Association of Professional Engineers of Ontario.
 5. The accompanying report is based on a personal examination of the area in September and October, 1969, and from information contained in reports published by the Geological Survey of Canada.
 6. I have no interest, directly or indirectly, in the properties or securities of Mark V Mines Ltd. (N.P.L.) nor do I expect to receive any.

A.R. Bullis, P. Eng.

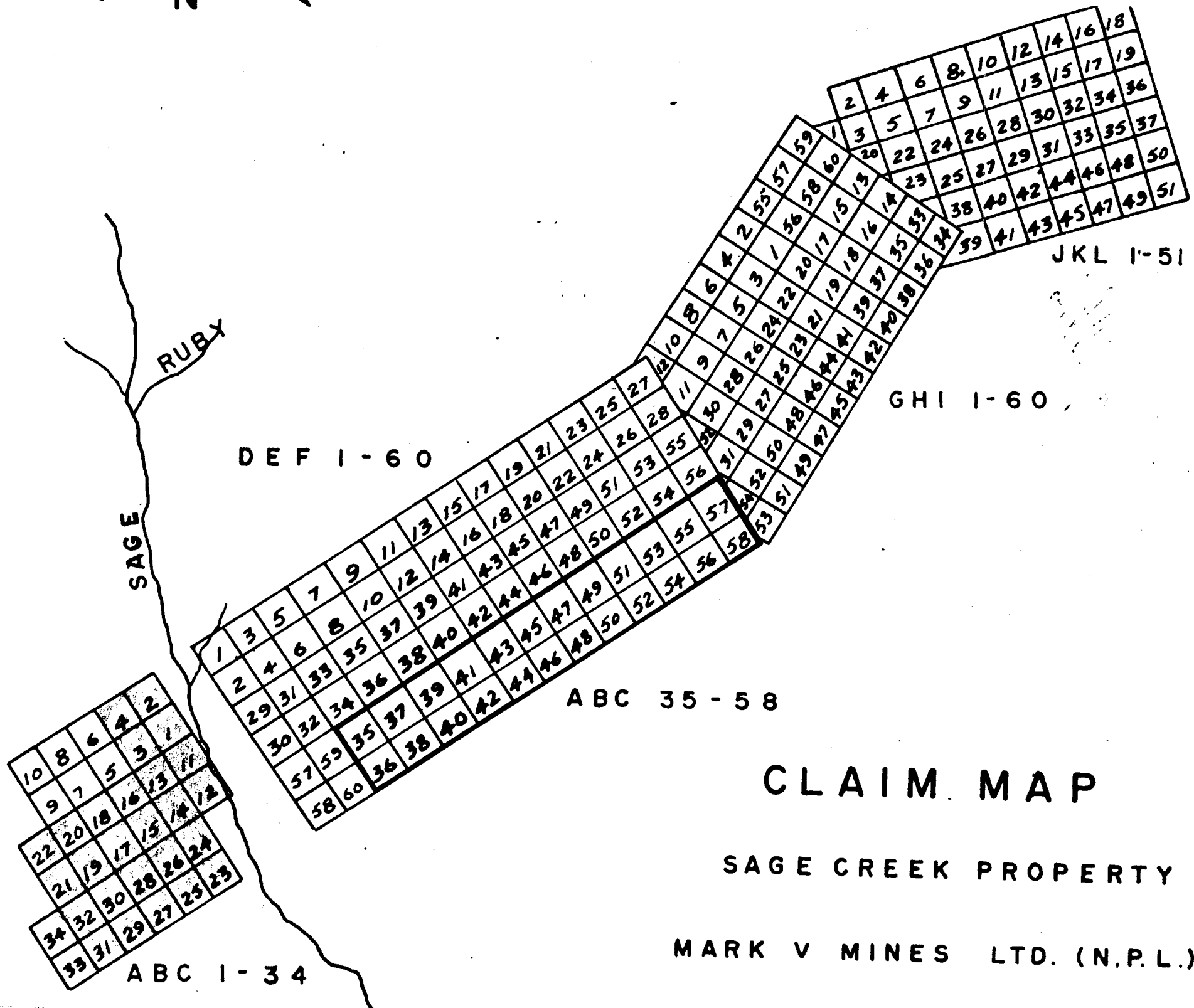
December 15, 1969

DELTA, B.C.

AR Bullis
AR Bullis



LOCATION MAP
SAGE CREEK PROPERTY
MARK V MINES LTD. (N.P.L.)
To Accompany Report by
A.R. Bullis, P. Eng.
December 15, 1969



RUBY

SAGE

DEF 1 - 60

ABC 35 - 58

GHI 1 - 60

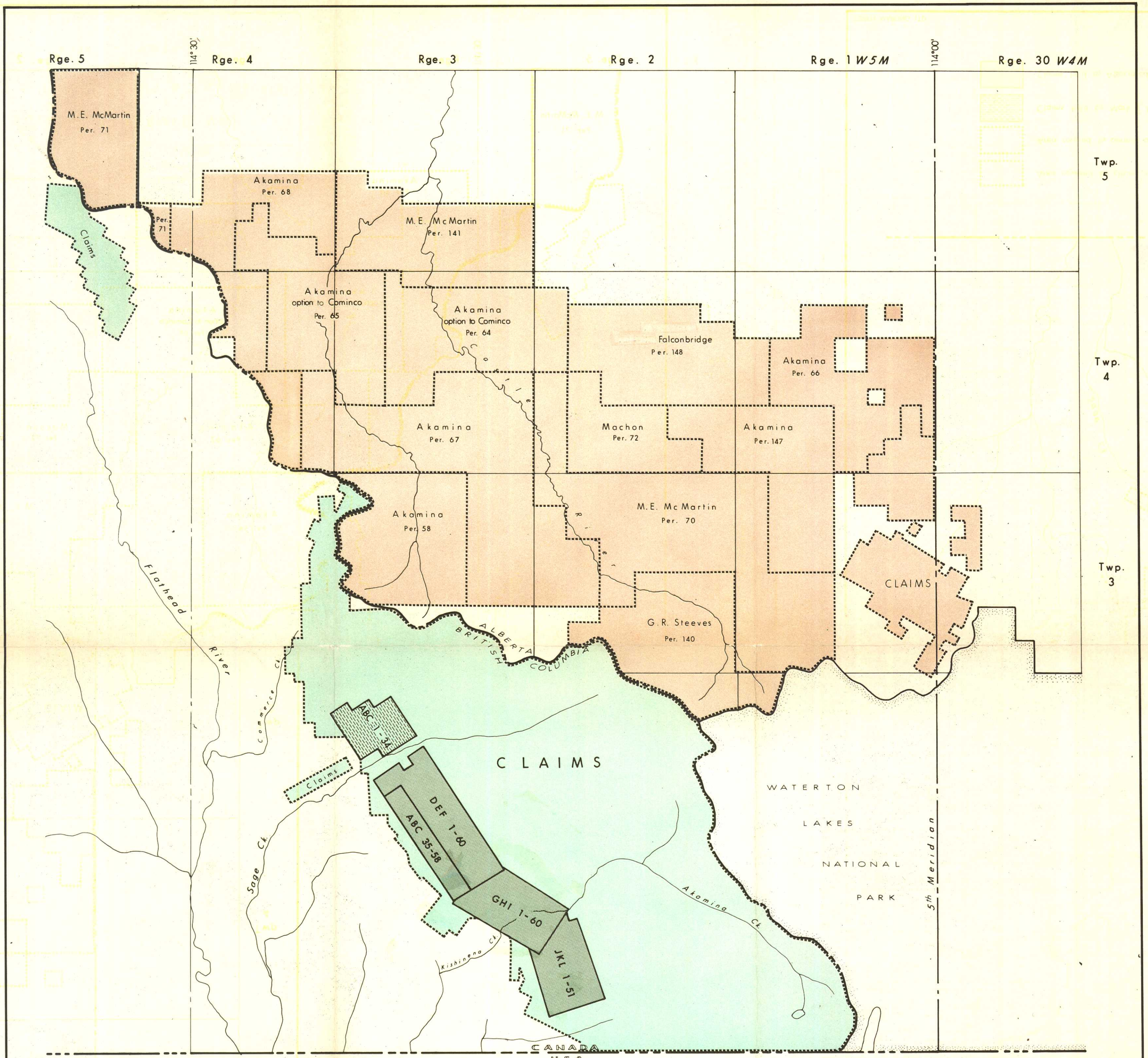
JKL 1 - 51

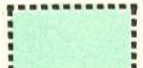
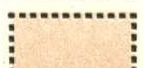
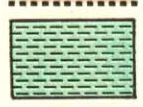

ABC 1 - 34

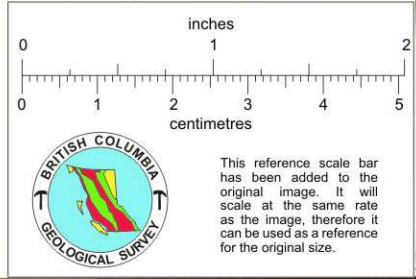
CLAIM MAP

SAGE CREEK PROPERTY

MARK V MINES LTD. (N.P.L.)



-  Area covered by claims in British Columbia
-  Area covered by permits and claims in Alberta
-  Claims held by Mark V Mines Ltd.
-  Claims held by Associated Groups

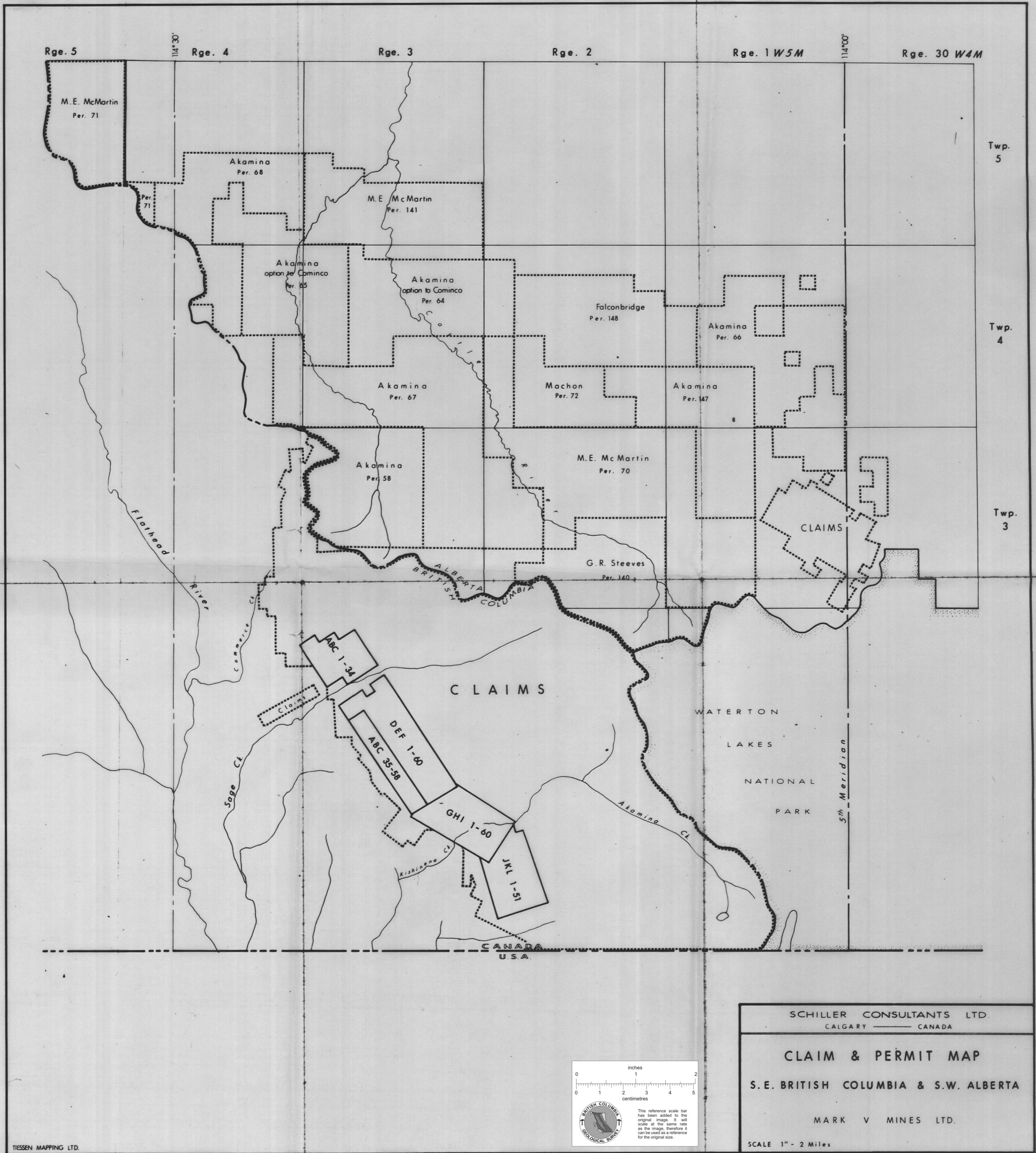


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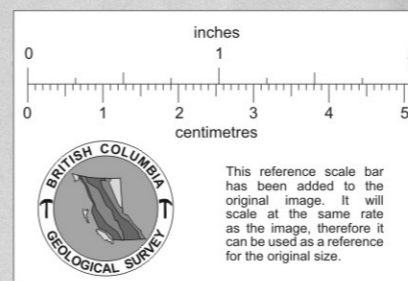
CLAIM & PERMIT MAP
S. E. BRITISH COLUMBIA & S.W. ALBERTA

MARK V MINES LTD.

SCALE 1" = 2 Miles



TIESSEN MAPPING LTD.

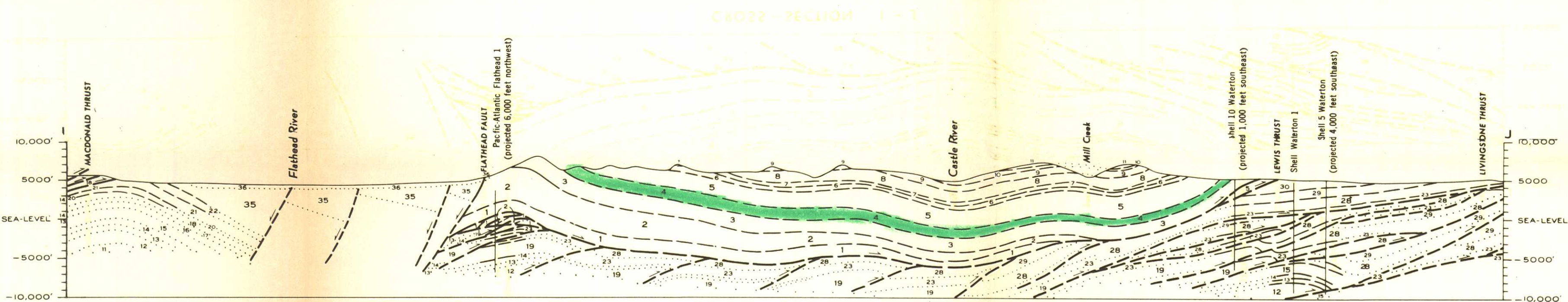


SCHILLER CONSULTANTS LTD.
 CALGARY — CANADA

CLAIM & PERMIT MAP
 S.E. BRITISH COLUMBIA & S.W. ALBERTA

MARK V MINES LTD.

SCALE 1" = 2 Miles



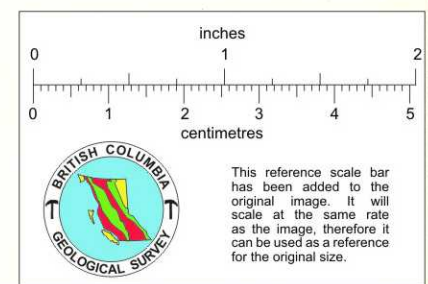
CROSS-SECTION I - J



Tp. 5
Twin Butte Thrust
Twin Butte Thrust
Tp. 4
Tp. 3
Tp. 2
Tp. 1

- PURCELL**
- 10 ROOSVILLE FORMATION (Kintla Formation, Member D): green and grey argillite, siltstone and sandstone; light coloured argillaceous and stromatolitic dolomite
 - 9 PHILLIPS FORMATION (Kintla Formation, Member C): red and purplish red sandstone, siltstone and argillite
 - 8 GATEWAY FORMATION, UPPER MEMBER: (Kintla Formation, Members A and B): red, purplish red and grey argillaceous siltstone and argillite; green and greenish grey argillite, dolomitic argillite and sandstone; dolomite; dolomitic sandstone
 - 7 SHEPPARD FORMATION (Gateway Formation, Lower Member): light grey quartzitic and dolomitic sandstone, dolomite, and oolitic dolomite; green argillite and dolomitic argillite; red siltstone and sandstone; chloritized andesite and pillowed andesite
 - 6 PURCELL LAVA: dark green, purplish green, and reddish green, chloritized andesite, amygdaloidal andesite, and pillowed andesite
 - 5 SIYEH FORMATION: grey limestone, dolomite, argillaceous dolomite, and sandy dolomite; green and red argillite, stromatolitic limestone
 - 4 GRINNELL FORMATION: red argillite, white and red sandstone and siltstone
 - 3 APPEKUNNY FORMATION: green and greenish grey argillite; white, grey, and green quartzose sandstone
 - 2 ALTYN FORMATION: dark grey and black argillaceous limestone and dolomite; black argillite; grey dolomitic argillite and argillaceous dolomite; sandy dolomite; stromatolitic dolomite
 - 1 WATERTON FORMATION: dense banded and streaked grey limestone and dolomite; green dolomite, argillaceous dolomite, and argillite; brownish red dolomite and argillaceous dolomite; dense white limestone

PRECAMBRIAN



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**AKAMINA CREEK AREA
GEOLOGY**

MARK V MINES LTD.

SCALE 1" = 2 miles