

Davis-Keays Mining Co. Ltd.(N.P.L.)

GEOLOGICAL REPORT

BONANZA GROUP
Liard Mining Division

28 miles S.S.E. of Muncho Lake

58° 125° - N.E. Quadrant

94 K ^W11/12 E

Work Performed May - Aug., 1967

J. F. McIntyre, P.Eng.
November 20, 1967

J. F. MCINTYRE, P.ENG.
 CONSULTING MINING ENGINEER
 408 - 475 HOWE STREET
 VANCOUVER 1, B.C.
 CANADA

1128

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INTRODUCTION

The Bonanza Group of twenty-seven mineral claims in Liard Mining Division, owned by Davis-Keays Mining Co. Ltd., form a part of a much larger block of claims the others of which were recorded at later dates. Of the other claims some are also designated Bonanza and others are designated by the name Eagle.

The Bonanza Group claims were subjected to a geological examination by the writer during the period May 18-19, 1967. At that time much of the ground was covered by snow and the amount of geological work accomplished was limited. One day was spent on the property. During the period June 24-30, 1967, the writer continued the geological work, assisted in the field by Mr. C. A. Stanford, B.Sc., staff geologist of the writer's firm. At this time sufficient snow had gone to permit detailed geological examination of the veins and enclosing rocks and sampling of the veins. Five days were spent on the property however work was hindered somewhat by rain on three of the five days.

On August 9, 1967, the company commenced an exploratory program on the entire block of claims, including the Bonanza Group. This program was completed on October 26, 1967.

On or immediately prior to August 26, the company filed an Affidavit on Application for Certificates of Work, applying for one Certificate of Work for each of the twenty-seven claims in the Bonanza Group. The claims had been recorded August 26, 1966. Considerable physical work was expended on the Bonanza Group claims during the period August 9-26, however due to the remote location of the claims and unavailability of invoices and time reports it was impossible to include this physical work in the Application. Additional work on the Bonanza Group claims, done after August 26, 1967, will be filed shortly along with that carried out on the other claims in the entire claim block.

This report is written within the context of describing the geological work performed on the claims for evaluation regarding the Application for Certificates of Work, rather than as a complete geological treatise on the property. Hence technical descriptions and discussion are kept to that minimum which is consistent with the nature of this report.

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PROPERTY

The Bonanza Group is located in Liard Mining Division along a south fork of Yedhe Creek (herein referred to as Caribou Creek), a tributary of Toad River. The property is situated 28 miles S.S.E. of Muncho Lake (or 18 miles S.S.E. of Mile 442 on the Alaska Highway). From Fort Nelson the property is approximately 101 miles west by W.S.W. Co-ordinates of the centre of the group are 58°33' North, 125°28' West.

The claims comprise a roughly rectangular group seven claims north-south by five claims east-west, however within the boundaries of the group are nine other Bonanza claims not included in the group, these having been staked and recorded later. However all claims included in the Bonanza Group are nonetheless contiguous. They are as follows:

<u>Claim</u>	<u>Record No.</u>
Bonanza 3A	24296
" 8A	297
" #12A	298
" #16A	299
" # 1B	300
" # B5	301
" # 9B	302
" #13B	303
" #17B	304
" Cr. # 4B	24595
" Cr. # 8B	596
" Cr. #12B	597
" Cr. # 2A	598
" Cr. # 5A	599
" Cr. #10A	600
" Cr. #14A	601
" Cr. #18A	602
" No. 3B	603
" No. 7B	604
" No. 11B	605
" No. 15B	606
" No. 19A	607
" A No. 1	608
" A No. 6	609
" A No. 9	610
" A No. 11	611
" A No. 15	612

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During this year the property was accessible only by helicopter or pack trail. The location of the property is shown on Figure 1. This property is located 3-3 1/2 miles northwest of the Magnum property of Churchill Copper Mines Ltd. and is closely related geologically and economically.

FIELD WORK

Mapping and Sampling

The field geological work consisted of examination of veins, dikes and country rock, recording of widths and attitudes, preparation of sketches, collection of specimens, some hand trenching and sampling of the veins. A helicopter was employed on both trips to gain access to the property and was used on both occasions to ferry personnel from point to point on the claims, the ground consisting of high, rugged mountains, all above the timberline.

Only helicopter hours spent on the property were claimed as cost for Certificates of Work. Fees claimed included only the daily fees for time spent on the property during the two trips by the writer, and his staff geologist. Expendable field supplies claimed for consisted of tents, lumber, fuel, hand tools and miscellaneous supplies, these items of expense having been incurred during the period August 9-26, 1967.

Not included in the Application were the fees and costs of transportation to the property, cookhouse supplies, labour supplied on the property by two prospectors during the two trips, helicopter ferrying charges, assays and physical effort performed during the period August 9-26, as this figure was not available at the time of application. Hence applicable expenses incurred were far beyond the total claimed toward Certificates of Work.

The claims and locations of the veins are shown on Figure 2. This map is composed from the B. C. Mineral Map with some correction as noted in the field. However during the field work the veins were not tied closely into the claims, hence positions of claim lines and posts are not shown on the detailed sketch maps of the principal veins, Figures 4, 5 and 6. No detailed sketches are included for

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the William and Keays veins as, while these were briefly examined in the field by helicopter reconnaissance and a few spot landings, it was not possible due to snow conditions to climb to the locations and take measurements and samples.

The work claimed herein was conducted principally on claims Bonanza Cr. 2A and 10A and on Bonanza 3A and 12A. Lesser amounts of time were spent on Bonanza 1B and on those claims along the valley bottom of Caribou Creek.

List of Personnel and Rates

<u>Name</u>	<u>Category</u>	<u>Rate</u>
J. F. McIntyre, P.Eng.	Cons. Engineer	\$150 per day
C. A. Stanford, B.Sc.	Geologist	\$ 80 per day
D. Broeder	Helicopter Pilot	No cost claimed
Harris Davis	Prospector	No cost claimed
R. R. Keays	Prospector	No cost claimed
Okanagan Helicopters	Helicopter	\$130 per hour

GEOLOGY

The rocks underlying the Bonanza Group claims are moderately metamorphosed sediments. Published mapping to date has not covered the claims area however rocks of the same section are shown on G.S.C. Map No. 1000A along and south of Mile 438-442. These were then mapped as Lower Cambrian and earlier. More recent but as yet unpublished mapping by Dr. Gordon Taylor, G.S.C., discloses the rocks underlying the Bonanza Group to be definitely of Proterozoic Age. Detailed geology in the vicinity of the claims is shown on Figure 3.

The sediments are a very thick assemblage, probably in excess of 4,000 feet, of thin-bedded, dark grey, silty, argillite and slate. They are rather common, non-descript rocks. Individual beds are commonly less than 1' thick and in many parts of the section are bedded in distinct layers as thin as 1/2". More massive beds are seldom over 3-5' in thickness. Within the section are some beds of limy argillite in which the lime content is low. Also included, at various points in the section, are individual thin beds of grey, crystalloblastic dolomite. These are usually separated by at least tens of feet in the section and where seen, vary from 2" to 6" in thickness. They are peculiar interbeds, composed of lath-like crystalloblasts of whitish dolomite set

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in a matrix of fine-grained, dark grey dolomite. The crystalloblasts vary in length from 1/8 to 1/2" in length by 1/32 to 1/8" in thickness, yielding a texture of from fairly coarse to very coarse. The crystalloblasts commonly comprise about 60% of the volume of the rock. No attempt was made to work out any stratigraphic sequence or sub-division, this being of no particular consequence to the task at hand.

The sediments are strongly and, in part, closely cleaved throughout the group. The cleavage strikes about N30°W on the average and dips at or very near the vertical. The closest cleavage observed was at the vicinity of the Oscar Vein where the cleavage planes are commonly at 1/8" to 1/4" spacings and have reduced the rock (bedded here rather flatish) to a wafer-like assemblage standing on end. Except for this location the sediments, where observed, are fairly competent rocks.

The sedimentary series is folded into a broad, fairly gentle anticline, with north-south trending axis located roughly along the row of mountains between Caribou and Eagle Creeks. Within the anticline, at its crest, is a fairly gentle syncline the axis of which conforms with the axis of the anticline. No axial plunges were discerned. In the ridges east of Eagle Creek and west of Caribou Creek, bedding dips generally at 35-45°. Within these limits in the central part of the anticline dips seldom exceed 45°.

The sedimentary series is cut, at frequent intervals by a set of pyroxene gabbro dykes. These are most prominent features which commonly extend for several thousands of feet along strike, attain widths of from 15' to 60' and commonly stand in relief some 5 - 20' above the enclosing rocks. The gabbro is a fairly hard, dark green, medium to coarse-grained rock composed principally of common pyroxene with a much lesser amount of plagioclase feldspar (not identified). These rocks might be properly termed as diabase but this point was not resolved. The dykes strike at N20-40° and dip at or near the vertical. On the surface the rock is nearly black but with a brownish tinge.

The sedimentary series is further cut by a number of veins of copper ore and of lead ore. These are of economic significance and are discussed following.

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ORE OCCURRENCES

Two distinctly different sets of metalliferous veins occur in the group, denoted herein as copper veins and lead veins. The Harris, Pink, Keays and William veins are of the first set and the Bob and Oscar veins are of the second.

The copper veins are fault veins, occupying strong fault structures of strong, persistent opening, filled with quartz, carbonates, inclusions of country rock, chalcopyrite and in places (at the surface) erythrite. Widths of veins vary from 2' to 8.5' where measured and all dip at or very near the vertical. Details and sampling carried out on the Harris and Pink veins are shown on Figure 4. These veins appear to be definitely related both in attitude and origin to the gabbroic dykes. The writer observed chalcopyrite-bearing quartz veinlets in the dyke adjacent to the Harris vein indicating that this dyke, at least, is of pre-mineral age. The Pink vein shows considerable erythrite on the surface, assaying up to 0.5% cobalt but none was seen on the Harris vein. The copper veins present thin, but very bold, dark rusty gossans with erratic green malachite patches on the surface. These were observed also on both the Keays and William veins from the air. No sulphide other than chalcopyrite was seen in the veins. Gold and silver assays were run but contents are near negligible and not presented herein.

The lead veins are of entirely different character to the copper veins. They are rather indistinct fracture veins in which the mineralization has followed the stronger fracture systems, but also along lesser branch fractures. This is characteristic of the Bob vein. The Oscar vein appears to be closely related to the Bob vein (probably stemming from the same "plumbing" system) but occurs in conformity with the cleavage in the rocks rather than along fractures which transect the cleavage. The mineralization in these occurs within a blue-black, cherty alteration in brecciated country rock along the fractures. In places such as the lower Bob vein the mineralization has progressed horizontally along fractures and/or bedding separation. Mineralization consists of very finely crystalline galena with a little quartz and carbonate and occasional "dashes" of fine-grained bornite in the galena. Silver occurs in unusually low amounts and gold values, while assayed, are not important and are not presented. Zinc is present only as a trace.

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ECONOMIC POSSIBILITIES

The copper veins are of obvious economic significance despite latitude and location. They occur in widths up to 8.5' at grades of the order of 4-7% Cu. (Harris vein) and are certainly worthy of extensive exploratory work. The Harris vein is certainly so, and the Keays vein shows a good gossan suggestive of good copper values. The William vein attains widths of possibly 15' from aerial observation but little good gossan. The Pink vein contains cobalt but is of narrow width, however exploration along strike might find something of value.

The lead veins are of less economic importance at this time. Silver/lead ratios are very low, approximately 0.1/1.0 for the Oscar vein and 0.2/1.0 for the Bob vein. The Oscar vein occupies cleavage separation and although of high grade probably has very limited extent. The Bob vein could at some time not too distant be mineable.

At this stage the copper veins, principally the Harris and Keays veins, are of much more economic proportions than the lead veins and it is to these that immediate exploratory effort is justifiable. The Bob and Oscar veins can be more logically explored following a further measure of success in exploring the copper veins.

Respectfully submitted,



J. F. McIntyre, P.Eng.

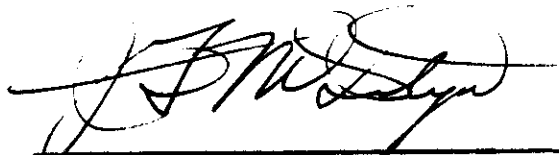
J. F. MCINTYRE, P.ENG.
CONSULTING MINING ENGINEER
408 - 475 HOWE STREET
VANCOUVER 1, B.C.
CANADA

CERTIFICATE

I, J. F. McIntyre, P.Eng., hereby declare that:

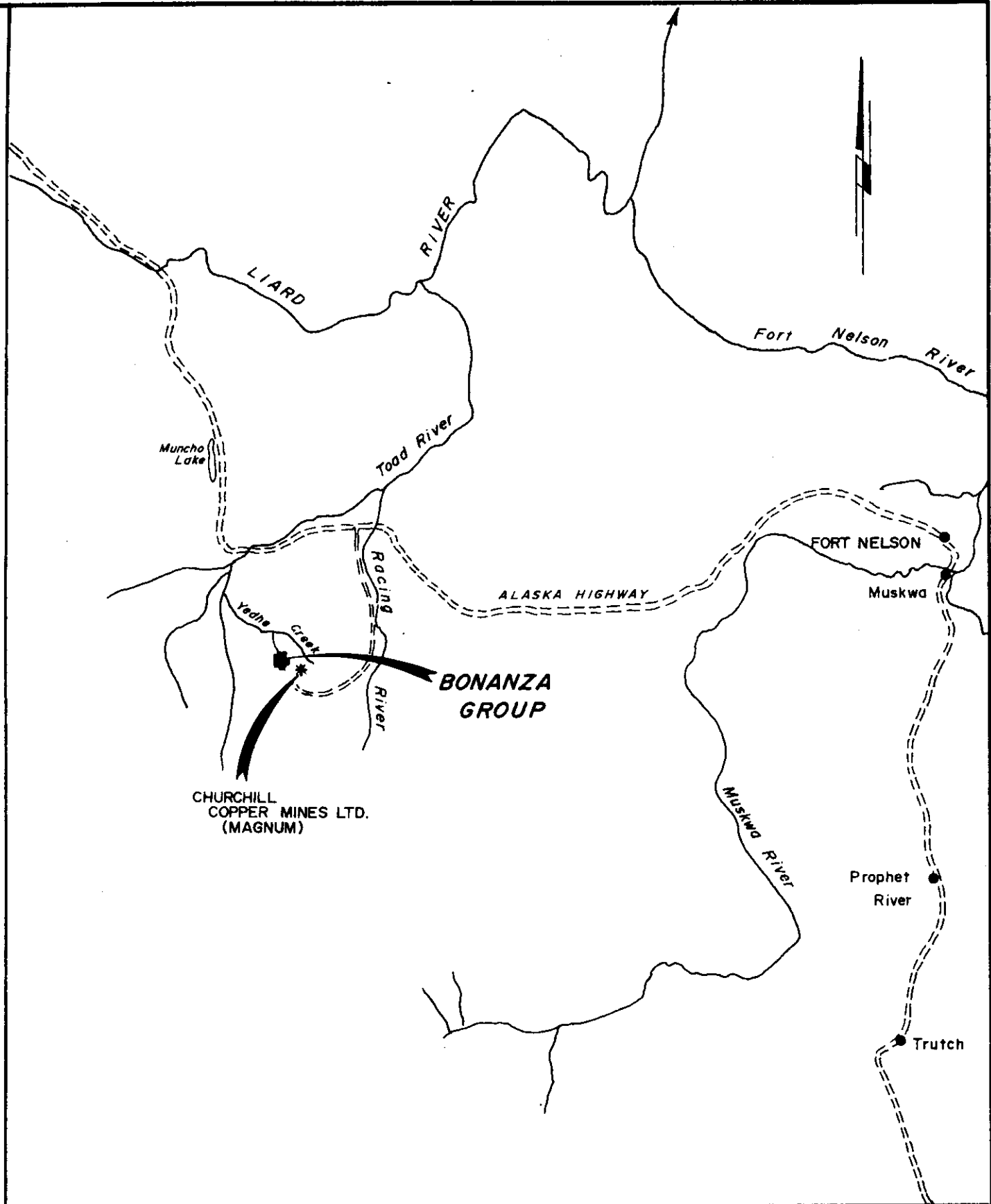
1. I hold the degree of Bachelor of Science in Mining Engineering, University of Alberta, 1949; and,
2. I am a registered member, in good standing, of the Associations of Professional Engineers of British Columbia and Alberta; and,
3. I carry on consulting mining engineering practice with offices at 408 - 475 Howe Street, Vancouver 1, British Columbia; and,
4. I have practiced my profession continuously since 1949 with wide experience in mining and geology; and,
5. I personally examined the Bonanza Group on May 19, 1967, and for five days during the period June 24-30, 1967, and my descriptions and conclusions were derived from these personal observations; and,
6. I am a shareholder and Director of Davis-Keays Mining Co. Ltd. and have acted in this matter both as a Consulting Engineer and as an agent of that company.

Signed:



J. F. McIntyre, P.Eng., B.Sc.

November 24, 1967



J. F. McINTYRE, P. ENG.		
CONSULTANT		VANCOUVER, B.C.
DAVIS-KEAYS MINING CO. LTD.(N.P.L.)		
LOCATION MAP		
DECEMBER, 1967	SCALE: 1" = 20Mls.	FIG.: 1

FT. NELSON
100 miles

	24602 K BONANZA CR18 A	24299 K BONANZA 16A	24612 K BONANZA 15A	24601 K BONANZA CR14A	
24304 K BONANZA 17B	24607 K BONANZA 19A	25917 K BONANZA 17A	25918 K BONANZA 13A	24298 K BONANZA 12A	
24300 K BONANZA 1-B	25912 R K BONANZA 2B	25916 R K BONANZA 16B	24610 K BONANZA A9	24600 K BONANZA CR.10A	
24603 K BONANZA 3B	24595 K BONANZA CR4B	24606 K BONANZA 15B	24297 K BONANZA 8A	25918 R K BONANZA 7A	
24301 K BONANZA 5B	25913 R K BONANZA 6B	25915 R K BONANZA 14B	24599K BONANZA CR5A	24609 K BONANZA A6	
24604 K BONANZA 7B	24596 K BONANZA CR8B	24303 K BONANZA 13B	25920 R K BONANZA 4A	24296 K BONANZA 3A	24611 K BONANZA 11A
24302 K BONANZA 9B	25914 K BONANZA 10B	24597 K BONANZA CR12B	24608 K BONANZA 1A	24598 BONANZA CR2A	
		24605 K BONANZA 11B			

WILLIAM VEIN

BOB VEIN

OSCAR VEIN

KEYS VEIN

HARRIS VEIN

PINK VEIN



CLAIM NOT INCLUDED IN GROUP

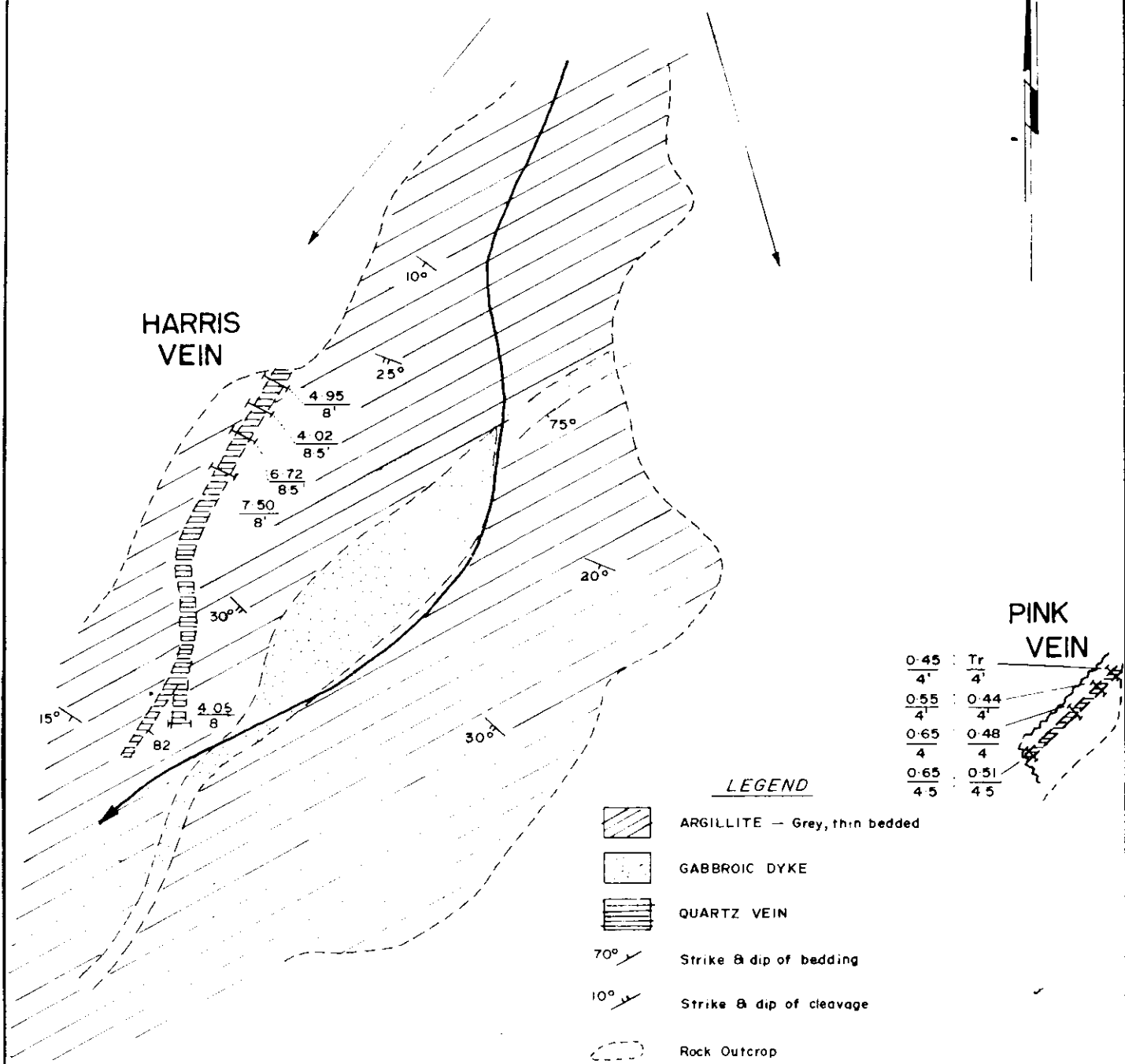
J. F. McINTYRE, P. ENG.
CONSULTANT VANCOUVER, B.C.

DAVIS-KEYS MINING CO. LTD. (N.P.L.)

CLAIM MAP

December, 1967 SCALE: 1" = 1/2 mi. FIG.: 2

Hillside covered by light shrubbery & grey argillite scree



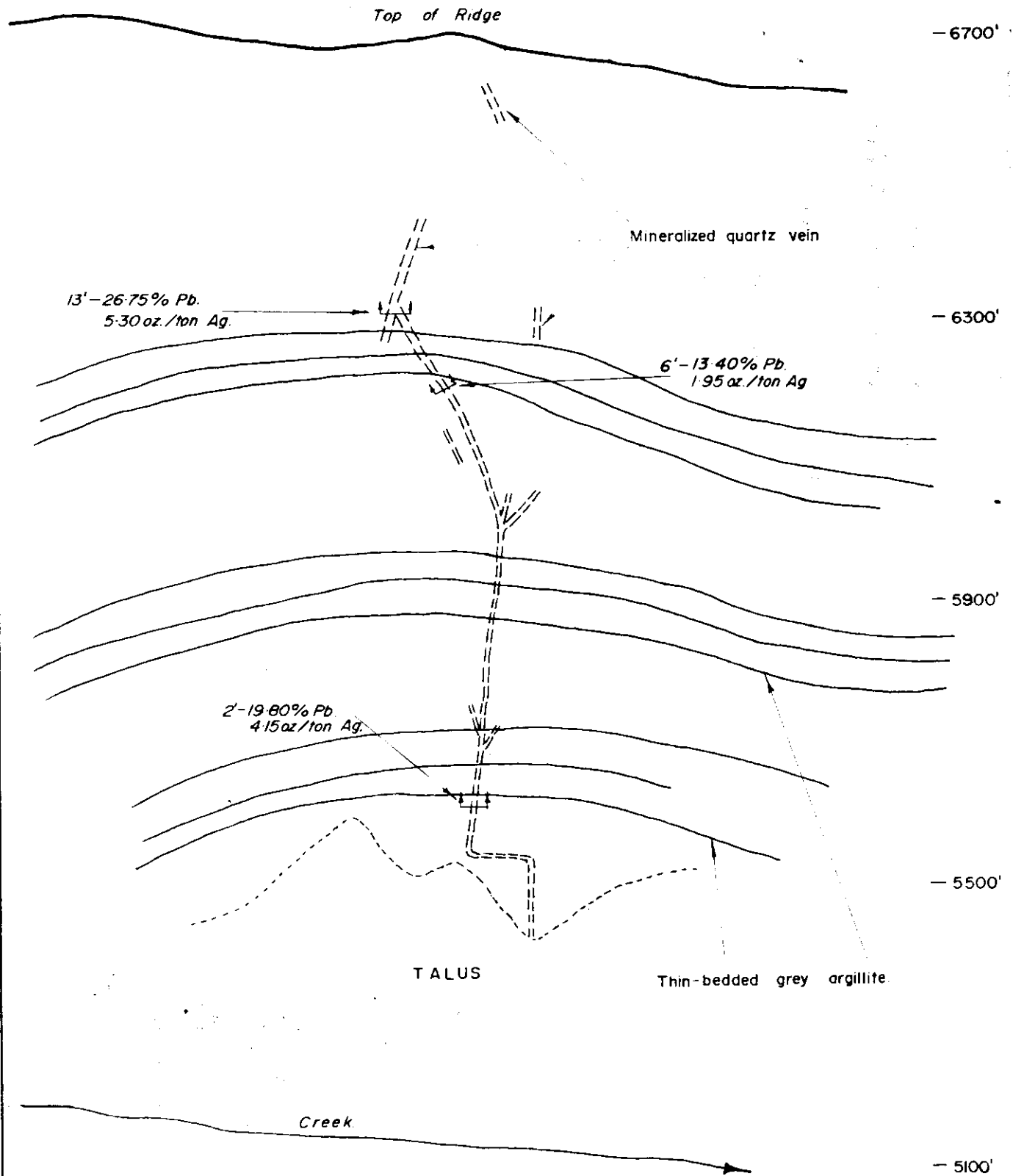
0.45	Tr
4'	4'
0.55	0.44
4'	4'
0.65	0.48
4	4
0.65	0.51
4.5	4.5

LEGEND

- ARGILLITE — Grey, thin bedded
 - GABBROIC DYKE
 - QUARTZ VEIN
 - 70° Strike & dip of bedding
 - 10° Strike & dip of cleavage
 - Rock Outcrop
 - Contact
 - Chip sample
- | | | | |
|-----|-----|-------|-------|
| 1.0 | 0.2 | %Cu | %Co |
| 4 | 4 | width | width |

NOTE: Bedding shown are prevailing strikes & dips, however beds are crumpled into a series of small, north trending folds

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DAVIS-KEYS MINING CO. LTD. (N.P.L.)	
HARRIS & PINK VEINS	
December, 1967	SCALE: 1" = 100'
	FIG.: 4



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CONSULTANT VANCOUVER, B.C.

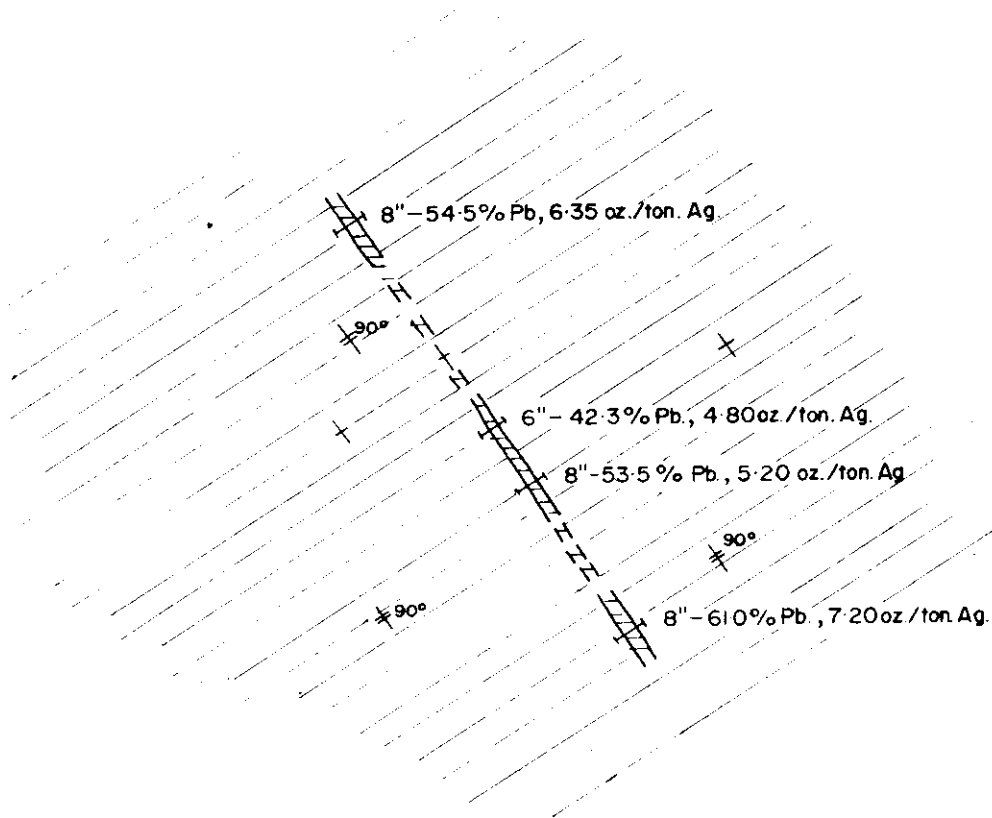
DAVIS-KEYS MINING CO. LTD. (N.P.L.)

BOB VEIN (looking S.W.)

December, 1967






SCALE: 1" = 200'

FIG.: 5



Vicinity of vein underlain by thin-bedded, grey argillite, flatly bedded but intensely & closely cleaved parallel to vein resulting in wafer-like condition.

LEGEND

-  ARGILLITE - Grey, thin-bedded
-  QUARTZ VEIN
-  70° Strike & dip of bedding
-  40° Strike & dip of cleavage
-  Chip sample

J. F. McINTYRE, P. ENG.
CONSULTANT VANCOUVER, B.C.

DAVIS-KEAYS MINING CO. LTD. (N.P.L.)

OSCAR VEIN

December, 1967

SCALE: 1" = 10'

FIG.: 6

Canada

Province of British Columbia

To Wit:

In the Matter of

I, J. F. McIntyre, P.Eng., of 408 - 475 Howe Street
Vancouver 1, in the Province of British Columbia.

Do Solemnly Declare that the following is a statement of costs expended during the period May 19 - August 26, 1967, in exploratory work on the Bonanza Group of mineral claims, Liard Mining Division, applicable toward Certificates of Work for the period ending August 26, 1968.

(1) Helicopter charges (for time spent on property only and exclusive of ferrying)		\$2,625.00
(2) Physical effort (professional fees for time spent on property only)		
J. F. McIntyre, P.Eng.	\$1,050.00	
C. A. Stanford, B.Sc.	<u>480.00</u>	1,530.00
(3) Expendable field supplies (tents, lumber, fuel, hand tools and miscellaneous)		<u>292.50</u>
		<u><u>\$4,447.50</u></u>

And I make this solemn Declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath, and by virtue of the Canada Evidence Act.

Declared before me

at Vancouver

in the Province of British Columbia.

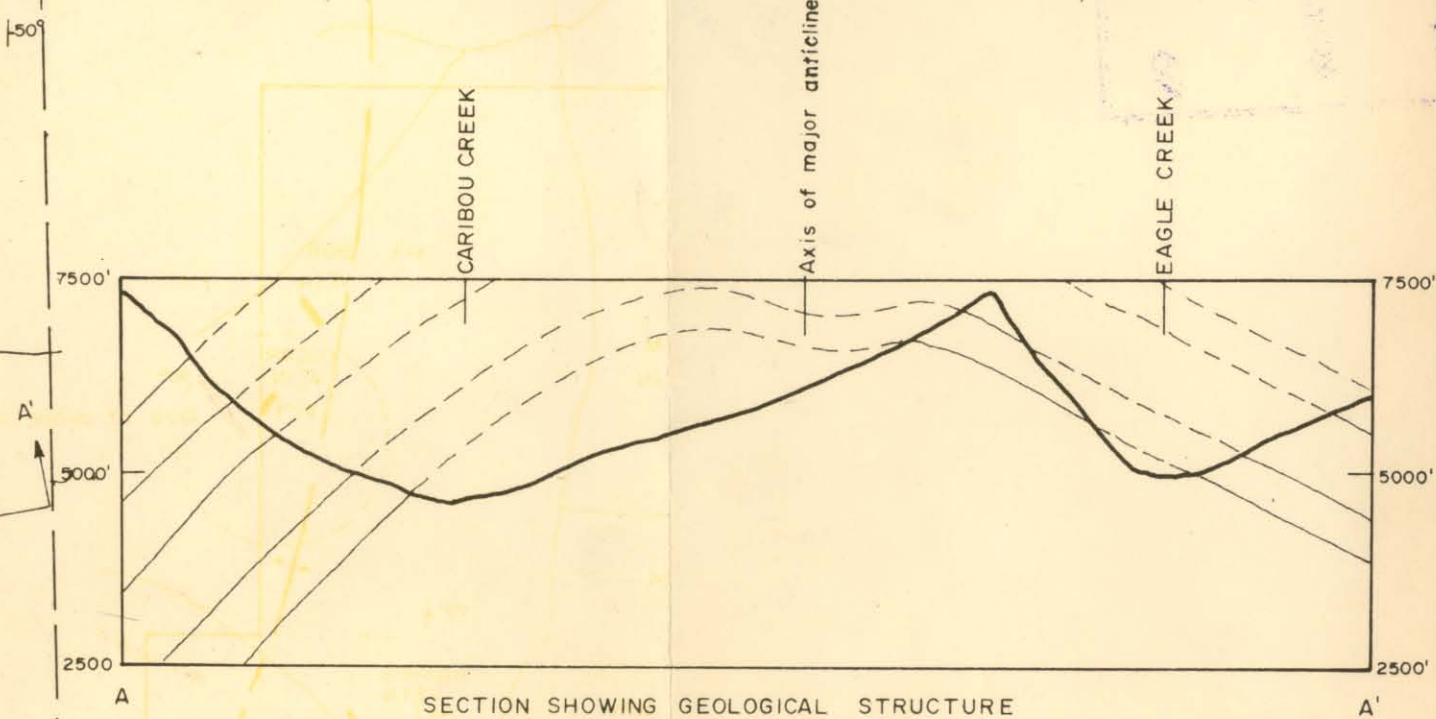
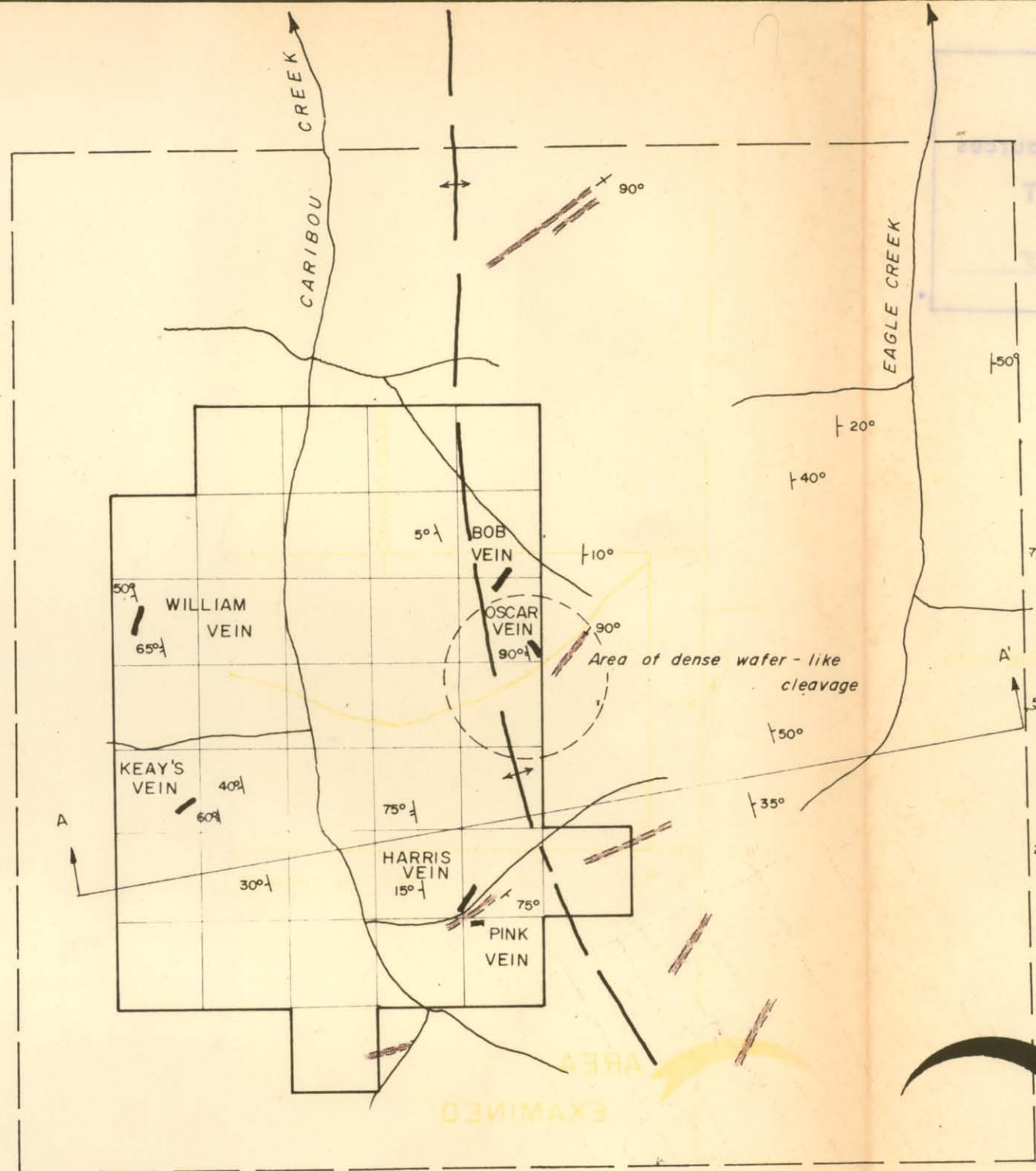
this 24th day of

November A.D. 1967.

[Signature]

[Signature]

Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. 1128 MAP 2



SECTION SHOWING GEOLOGICAL STRUCTURE

AREA EXAMINED

- LEGEND**
- Gabbroic dyke
 - Strike & dip of bedding
 - Strike & dip of cleavage

NOTE: Underlying rocks throughout the area examined are thin bedded, grey argillites of Proterozoic age
 Dykes & veins not surveyed

J. F. McINTYRE, P. ENG.	
CONSULTANT	VANCOUVER, B.C.
DAVIS-KEAYS MINING CO. LTD. (N.P.L.)	
GEOLOGY OF CLAIMS & VICINITY.	
December, 1967	SCALE: 1" = 1/2 mi. FIG.: 3

1128