

81-#688  
-9414

Geological-Geophysical Evaluation  
Of the OK1-OK5 Clms. - 5 Units  
(Bluehawk Gold-Silver Mine)

49°59'N, 119°39'W: NTS 82E/13  
Bluegrouse Mtn., 12 Km NW of Kelowna  
Vernon Mining Div., British Columbia  
by

N.C.Lenard, P.Geol., P.Eng. Sept. 1, 1981  
Consulting Geologist, Westbank, B.C.

Field Work Done: Mar. 19, Aug. 28, 1981  
Owner: N.C.Lenard

MINERAL RESOURCES BRANCH  
ASSESSMENT REPORT  
**9414**  
NO.

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Introduction:

This report is an economic geological-geophysical appraisal of soil geochemical anomalies from earlier surveys and, of quartz veins on the five one-unit OK1-OK5 Claims. OK5 Claim includes the old workings of the Bluehawk Gold Mine ; which recorded one shipment of five tons in 1935, grading 1.0 oz. Gold and 3.5 oz. Silver per ton. The property is on Blue Grouse Mountain on the west side of Okanagan Lake near Kelowna.

Evaluation is based on data gathered in the field and from published and unpublished reports. The most recent work in the vicinity was done by the writer in 1980 as a geological reconnaissance of the surrounding Bear 3 and adjacent Bear 2 Claims ( Assessment Report 9074 ).

Field work was done by belt chain and compass tied to roads, topographic features and the mineral workings on March 19 and August 28, 1981.

Purpose:

Aim of the work was to do a preliminary geophysical VLF-EM survey over the vein system and associated soil geochemical anomalies of the old gold-silver mine; and, to chip-sample surface veins to check economic grades of precious metals recorded by Fox (1974), to determine mineralizing controls and potential tonnage of gold-silver values. High gold values found last year by the writer at a shallow shaft at site D on Fig.1 may be in a chimney or pipe-like lode in that quartz vein, and this was to be studied.

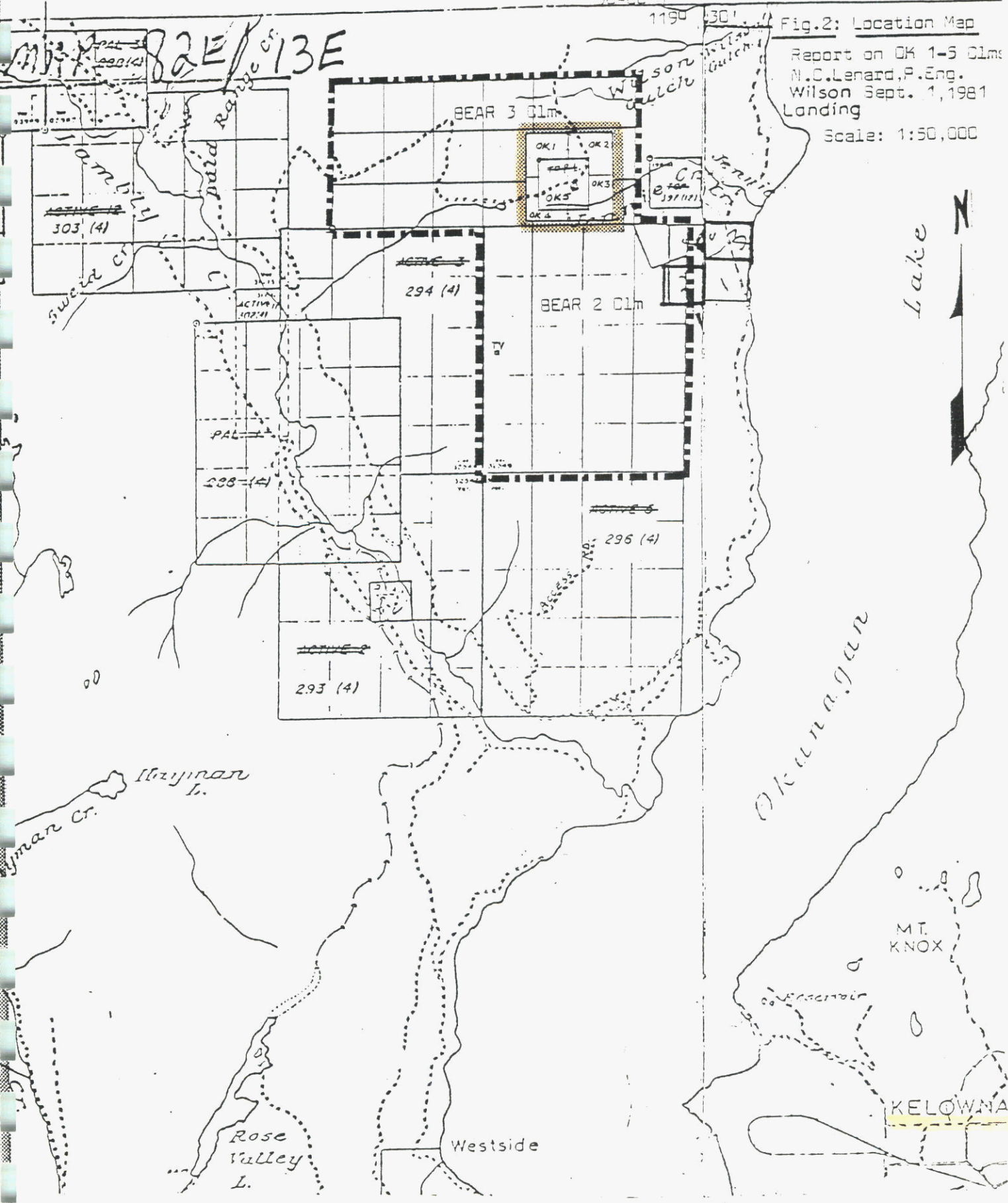
Accordingly, the vein sampling was done in March, and follow-up bulldozing was done in August of veins D,E,and F and of pyritized, gold-silver-copper-bearing crushed diorite below the road near the upper adit to expand earlier stripping and to determine relations of the vein segments of gold-silver bearing quartz of vein E and F.

Location & Access:

The subject claims are near the summit of Blue Grouse Mountain across the lake and about 12 Km from Kelowna. Access by auto or truck is via logging roads north of Bear (Lambly) Creek road, which is reached from Highway 97 at the Westside turnoff, about one mile west of Kelowna bridge. Fair to good logging roads span the property.

50000 IN

Fig. 2: Location Map  
Report on OK 1-5 OLMs  
N.C. Lenard, P. Eng.  
Wilson Sept. 1, 1981  
Landing  
Scale: 1:50,000



Property:

The Property consists of OK1-OK4, 2-post claims, which enclose the OK5 claim, staked in the modified system; it is the former 'Top' claim, which lapsed in Dec., 1980. They are enclosed in the 18-unit Bear 3 claim, held by N.C.Lenard. Claims OK1-4 represent lapsed Jim 1-4 2-post claims.

<u>Claim</u>	<u>Units</u>	<u>Record No.</u>	<u>Tag No.</u>	<u>Record Date</u>	<u>Owner</u>
OK1	1	911	462146M	Sept.4, 1981	N.C.Lenard
OK2	1	912	462147M	Sept.4, 1981	"
OK3	1	913	462148M	Sept.4, 1981	"
OK4	1	914	462149M	Sept.4, 1981	"
OK5	1	976	11765	Dec.29, 1981	"

Work History:

Surface stripping and underground workings of the Bluehawk Mine date back to the 1930's and possibly earlier. Southeast and northwest of the workings, old assessment reports describe trenched shear zones 40-50 feet wide and to 300 feet long, but with no record of mineralization, values, or maps. However, they were reported to be in 'granodiorite'.

Since 1965, the mine area and surrounding locale has been held and explored by Dawood Mines Ltd., which partly stripped the quartz veins and part of some copper-silver and gold soil anomalies ( see Ref.- Assessment Reports). No core drilling was reported, nor any ore shipments made. More recent work has been minor scaling of the main adit walls and roof.

This previous work indicates a fair to good potential for gold, silver and copper, partly as low-grade in crushed diorite below the upper portal. Quartz veins seem to be loosely related to soil Mercury anomalies, but not to ground magnetic features mapped.

### General Geology

The property is in the western border of the Shuswap metamorphic terrane, a broad region of old sedimentary belts and granitic plutons. Gold prospects in quartz veins occur near Vernon to the north and sparsely southward along the west side of Okanagan Lake to the Bluehawk deposit. Mineralization generally consists of small amounts of base metal sulphides with occasional bonanzas of gold, such as at the White Elephant deposit, 20 Km north of the OK claims. There, bismuth tellurides and free gold characterize that massive quartz complex, which is not unlike the setting at Oliver in southern Okanagan where a quartz quarry with low gold values offsets auriferous quartz veins in granite with local silver tellurides.

### Local Geology

Bedrock of the subject claims is metasediments of Permian Cache Creek age intruded by a stock-like, faulted basic diorite, a satellite of the granodiorite batholith which trends westerly about a claim length north of the property. Drift obscures this contact, and much of the vicinity of the claims. The tentative outline of the diorite shown on Fig.1, which is after Fox (1974) Fig.3, is obscured by extensive areas of faulted Cache Creek beds within it, masking the diorite body. Outcrops are best along road cuts and on some ridges.

As described earlier (Lenard, 1980), the setting resembles Bridge River and Cadillac, Que., where gold-quartz veins are genetically and structurally related to albitite pods and veins. The mine diorite of the OKS claim is partly replaced by albite, which locally accompanies pyritized quartz veining and diorite, along with calcite and sericite.

Quartz veins on the OKS claim range from about 1.0 to 4.0 feet in width (0.3m -13.1m). They dissipate upwards into the metasediments, which host linear trends of dislocated vein segments in places (vein E). Some of the latter appear to be rootless, hence are limited exploratory guides. Precious metal values occur as free gold, finely macroscopic, and possibly in late pyrite of the crushed, auriferous part of the veins; no obvious silver hosts have been noted, suggesting that the silver values may be carried by the late pyrite or by bismuth tellurides present in most auriferous samples.

## Geophysics

Preliminary VLF-EM was run over the mine locale, using a Ronka EM-16 VLF unit, Ser. 16872. The DM (Cutler, Maine) station was used for signal source. All data were filtered by the Fraser method (1969).

Reconnaissance lines were run on a true North bearing, with 30m stations, and on Line 1, with 15m stations. Locations of the lines are shown on Fig.1, and raw and filtered data are presented in the Appendix.

## Summary and Conclusions:

### Economic Geology-

Comparison of vein assays taken for this report with those from that of Fox(1974) show similar, though lower, results for gold and silver. It is not known if the Fox data are from chip or grab samples.

Binocular examination of assayed samples revealed an association of near microscopic free gold with bismuth telluride-bearing parts of crushed segments of the quartz veins. In places, these tellurides are smeared, resembling graphite. Hydrothermal sericite, calcite and pyrite occur locally with auriferous quartz. No silver-bearing minerals were seen to account for interesting silver values consistently present; for the present, pyrite or base metal tellurides are the assumed host for silver content.

### Structural Geology

Extension and deepening of earlier stripping of the quartz veins showed that the linear gold-silver bearing veins E and F are discontinuous and probably faulted segments in Cache Creek beds, and appear to be rootless. They may not be far laterally from their diorite origins.

This new stripping revealed that the diorite outcrops in the mapped area of the inferred stock-like mass are mainly windows, suggesting that:

(a) Earlier geochemical data from lines underlain by Cache Creek beds may be unreliable for guides to quartz veins in competent diorite rocks due to post-mineral structural displacement, and,

(b) That it may be practical to explore by surface stripping across vein strike or by low-angle slant drill holes to find the veins origins in diorite, since their gold-silver content and mineable widths warrant such a search. This applies particularly to the shaft site on vein D, where the writer last year found gold values of 2 to 4 oz./ton over an 8.0 in. width.

Geophysical

Plotting of filtered positive values from the VLF-EM data reveal generally low values with some intermediate values that may represent conductors. Significance of the latter is debatable, but two are sited near or at borders of the diorite, and none of the four mootly potential conductors are related to soil anomalies of Fox (1974), nor to soil mercury anomalies of Read (1969). However, the positive values on Line 2 at 155-220m, and at 650-670m parallel previously mapped ground magnetic highs; that to the south also is aligned with vein trends.

The potential conductors on Line 4 straddle mapped contacts of the diorite and Cache Creek beds, the one to the south, lying at the intersection of a mapped fault trace with that contact. Since this is near the east edge of an unexplored mercury anomaly of Read (1969), it may be worth following up with ground prospecting and trenching for basic geologic data.

Recommendations:

High precious metal values in multiple quartz veining of the mine diorite and masking, older sediments warrant exploration to outline extent and mode of the lode system in the following suggested manner:

(1) Drill shallow-angle slant holes along veins 'D' and 'E'; possibly trench west of the strike of veins 'E' and 'F' to seek their roots in diorite.

(2) Pit or strip copper-silver soil anomalies of Fox(1974) for 500 ft. east of the lower adit; for 1,000 ft. east of the upper adit; and for 700 ft. east to 1500 E on Fox's line 8+00N.

(3) Pit or strip anomaly H1 near the VLF-EM feature at 455-485m on Line 4.

(4) Search for old shear zones reported to be northwest and southeast of the Bluehawk Mine site.

(5) Drill a slant hole across the rusty, copper-bearing basic diorite below the road which crosses the dump of the upper adit to evaluate the low-grade potential of the crushed diorite, and the gold potential of the quartz vein 'B'.

===== *h.k.*



-CERTIFICATION-

I, Neall Curtis Lenard, of the settlement of Westbank in the Province of British Columbia do hereby certify:

1. that I am a consulting geologist with an office mailing address of Box 863, Westbank, British Columbia V0H 2A0,
2. that I graduated from the University of British Columbia with a Bachelor of Arts Degree in 1949 (Honours Geology),
3. that I have practised my profession continuously for thirty-one years,
4. that I am the sole owner of the subject OK 1-5 mineral claims,
5. that the statements made in this report are based on personal examination of the claims on March 19 and August 28, 1981, and, on a study of published and unpublished reports on the property area,
6. that I am a member of the Associations of Professional Engineers of British Columbia and Alberta,
7. that no legal survey has been conducted over the subject mining properties and, therefor, in accordance with the mining laws of the appropriate jurisdiction in which such properties are situate, the existence of and the area of such properties could be in doubt; and,
8. that I attended an extension short course on Exploration Geochemistry at the University of Calgary in 1970; and, a short course in Mining sponsored by the Northwest Mining Association at Spokane, Washington in April, 1981.

DATED AT: The Settlement of Westbank, in the Province of British Columbia, this first day of September, 1981.

*N. C. Lenard*

Neall Curtis Lenard, P.Eng., P.Geol.



.. Date Dec. 31/1981



-EXPENDITURES-

Personnel

N.C.Lenard, P.Geol., 2 days @ \$350. \$700.00  
(Mar.19, Aug.28, 1981)

I.Sarama, 1 day @ \$92.00 92.00

Transportation

Auto: 1 day @ \$25 25.00

Assays

130.00

Geophysical Equipment

Rental of VLF-EM Ronka EM16 81.00

Report Preparation

N.C.Lenard, P.Geol., 1 day @ \$350. 350.00

Drafting - 3 hours @ \$15. 45.00

Typing, Reprod'n, binding 60.00

Stripping, Trenching

Bulldozing 6 hours @ \$34. 204.00

Total Disbursements: \$1,687.00

I certify that the above statement is an accurate representation of expenditures made for the geological and geophysical survey of the OK1-5 claims conducted on March 19 and Aug.28, 1981.

N.C. Lenard  
N.C.Lenard, P.Geol., P.Eng.



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## CERTIFICATE OF ASSAY

TO Neall Lenard  
Box 863  
Vernon, B.C.

Certificate No. K-3844

Date April 9, 1981

**I hereby certify** that the following are the results of assays made by us upon the herein described \_\_\_\_\_ samples

Kral No.	Marked	GOLD	SILVER							
		Ounces Per Ton	Ounces Per Ton	Percent	Percent	Percent	Percent	Percent	Percent	Percent
1	OK-5 { 81 A1 - 4 81 B - 1 81 B - 2 81 D - 1 81 D - 2 81 D - 3 81 E - 1 81 E - 3 81 E - 4 81 F - 1	.005	.02							
2		.004	.04							
3		.004	.07							
4		.005	.04							
5		.013	.06							
6		.004	.04							
7		.12	.69							
8		.008	.07							
9		.005	.09							
10		.21	1.07							
11	Site 9 Bear 2 Quartz	.003	.04							

*Note: 1-10 : chip samples of  
quartz veins on OK5  
Sampled Mar. 19, 1981  
N.L.*

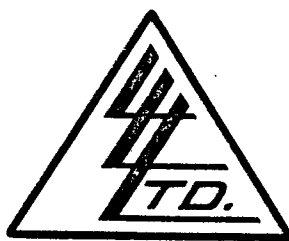
**NOTE:**  
Rejects retained three weeks.  
Pulps retained three months  
unless otherwise arranged.

Registered Assayer, Province of British Columbia

APPENDICES

To: Mr. Neall Lenard,  
Box 863,  
Westbank, B.C. VOH 2AO

File No. 20772-1  
Date March 2, 1981  
Samples Pulp



Certificate of  
ASSAY of  
LORING LABORATORIES LTD.

SAMPLE No.	%
<p>"Pulp Sample"</p> <p>16" Chip Top Claim <u>OKS</u> n.l.</p>	<p>Te</p> <p>0.009 : 90 ppm n.l.</p> <p>I Hereby Certify THAT THE ABOVE RESULTS ARE THOSE ASSAYS MADE BY ME UPON THE HEREIN DESCRIBED SAMPLES . . . .</p>

Rejects Retained one month.  
Pulps Retained one month  
unless specific arrangements  
made in advance.

*[Signature]*  
Assayer

# VLF-EM : Filtered Data

OK 5, 1, 2 Claims

## LINE 1 (L-1)

## LINE 2 (L-2)

Grid Station(m) Dip Filtered Value

STN. Dip Filtered Value

Line 1	Grid Station(m)	Dip	Filtered Value	Line 2	STN.	Dip	Filtered Value
1	00	+10		1	00 <sup>S</sup>	-9	
2	15 N	+6	+16	2	30	+6	+3
3	30	+10	+16	3	60	-3	-13
4	45	+10	+20	4	90	-13	-42
5	60	+9	+19	5	120	-26	-24
6	75	+10	+19	6	150	-14	+19
7	(Road) 90	+1	+11	7	180	-6	+35
8	105	+1	+2	8	210 S	+1	+26
9	120	0	+1	9	240	+5	+19
10	135	+4	+4	10	270	+9	+13
11	150 N	+6	+10	11	300	+10	+2
12	165	+9	+15	12	330	+6	-8
13	180	+8	+11	13	360	+5	-8
14	195	+5	+13	14	390	+3	-2
15	210	+7	+12	15	420 S	+6	+2
16	225	+1	+8	16	450	+4	+4
17	240	+5	+6	17	480	+9	+8
18	255	+6	+11	18	510	+9	+6
19	270	+1	+7	19	540	+10	-4
20	285	0	+1	20	570	+4	-16
21	300 N	+1	+1	21	600 S	-1	-17
22	315	+5	+6	22	630	-2	+5
23	330	+5	+10	23	660	+10	+22
24	345	+5	+10	24	690	+9	+8
25	360	+6	+11	25	720 S	+7	
26	375	+10	+16				
27	390	+10	+20				
28	405	+10	+20				
29	435	+5	+15				
30	465	+12	+21				
31	495 N	-5	+7				
32	515	-7	-12				
33	545	-18	-25				
34	575	-10	-28				
35	605	-5	-15				
36	635	-8	-13				
37	665 N	-19	-27				
38							
39							
40							
42							
43							



VLF-EM : Filtered Data

OK 5, 1, 2 Claims Vernon M.D.

LINE 3	Dip	Filtered Value	LINE 4	Dip	Filtered Value
STN (m)			STN (m)		
00	+5		00	0	
30 N	+5	+10	30 S	-10	-25
60	+8	+13	60	-16	-26
90	+4	+12	90	-19	-35
120	+3	+7	120	-10	-29
150	-1	+2	150	-16	-26
180	+5	+4	180	-10	-26
210 N	+11	+16	210	+9	-1
240	+1	+12	240	+10	+19
270	-1	0	270	+9	+19
300 N	-1	-2	300 S	+2	+11
330	+1	0	330	-5	-3
360	+5	+6	360	-5	-10
390	+5	+10	390	0	-5
420	+10	+15	420	-3	-3
450	+10	+20	450	+5	+2
480	-4	+6	480	+10	+15
510	-10	-14	510	+13	+23
540 N	-15	-25	540	+10	+23
570	-15	-30	570	+8	+18
600	-13	-28	600 S	+15	+23
630 N	-5	-18	630	+8	+23
			660	+4	+12

VLF-EM: Dip Angle Data

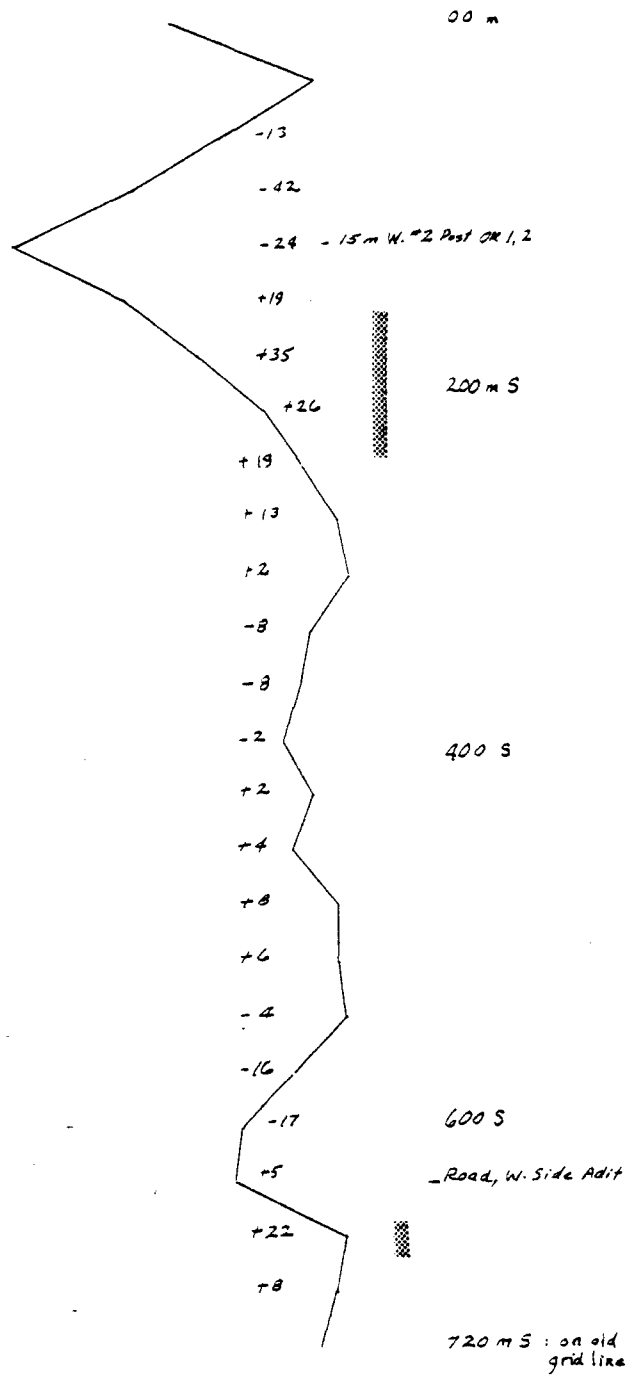
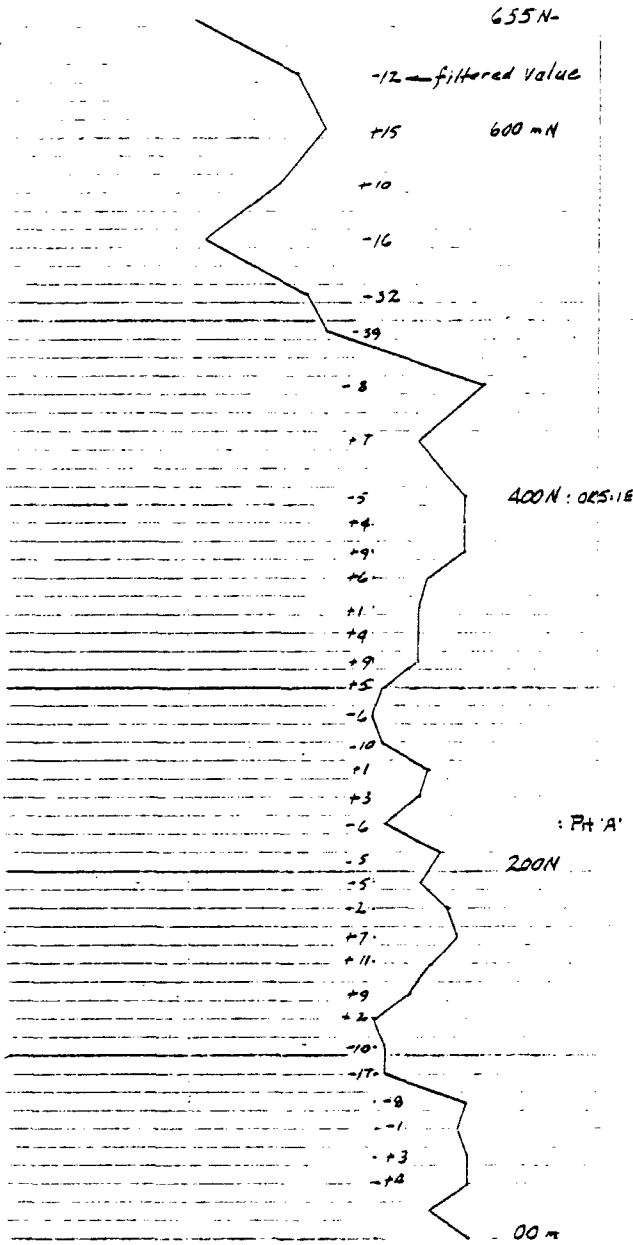
3  
Filtered Values

Line 1

-20° -10 0 +10 +20°

Line 2

-20° -10 0 +10 +20°



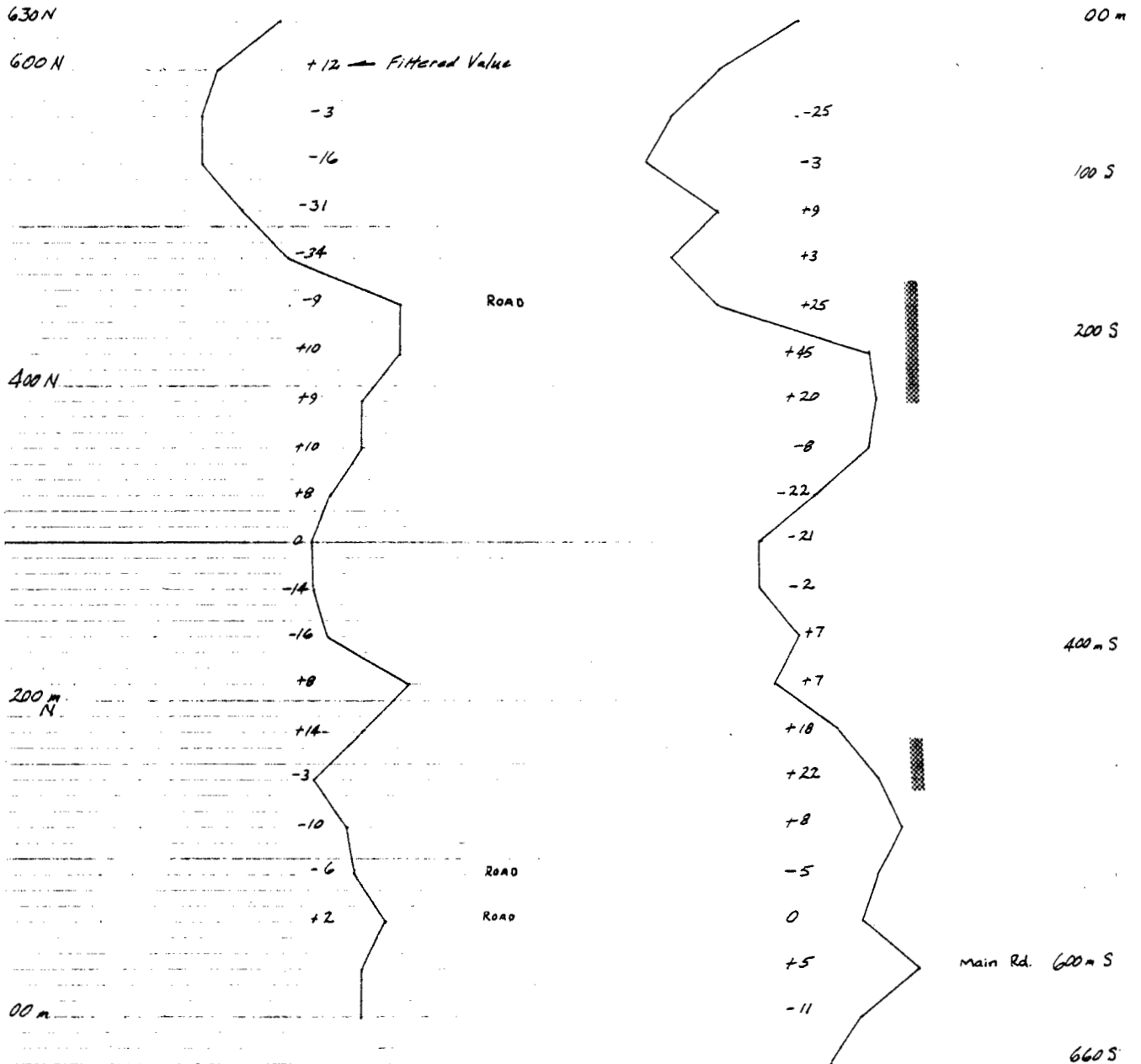
0 50 m

Possible Conductor

OUTLER

MAINE

-20° -10 Line 3 0 +10 +20°      -20° -10 Line 4 0 +10 +20°



0 50 m

Possible Conductor

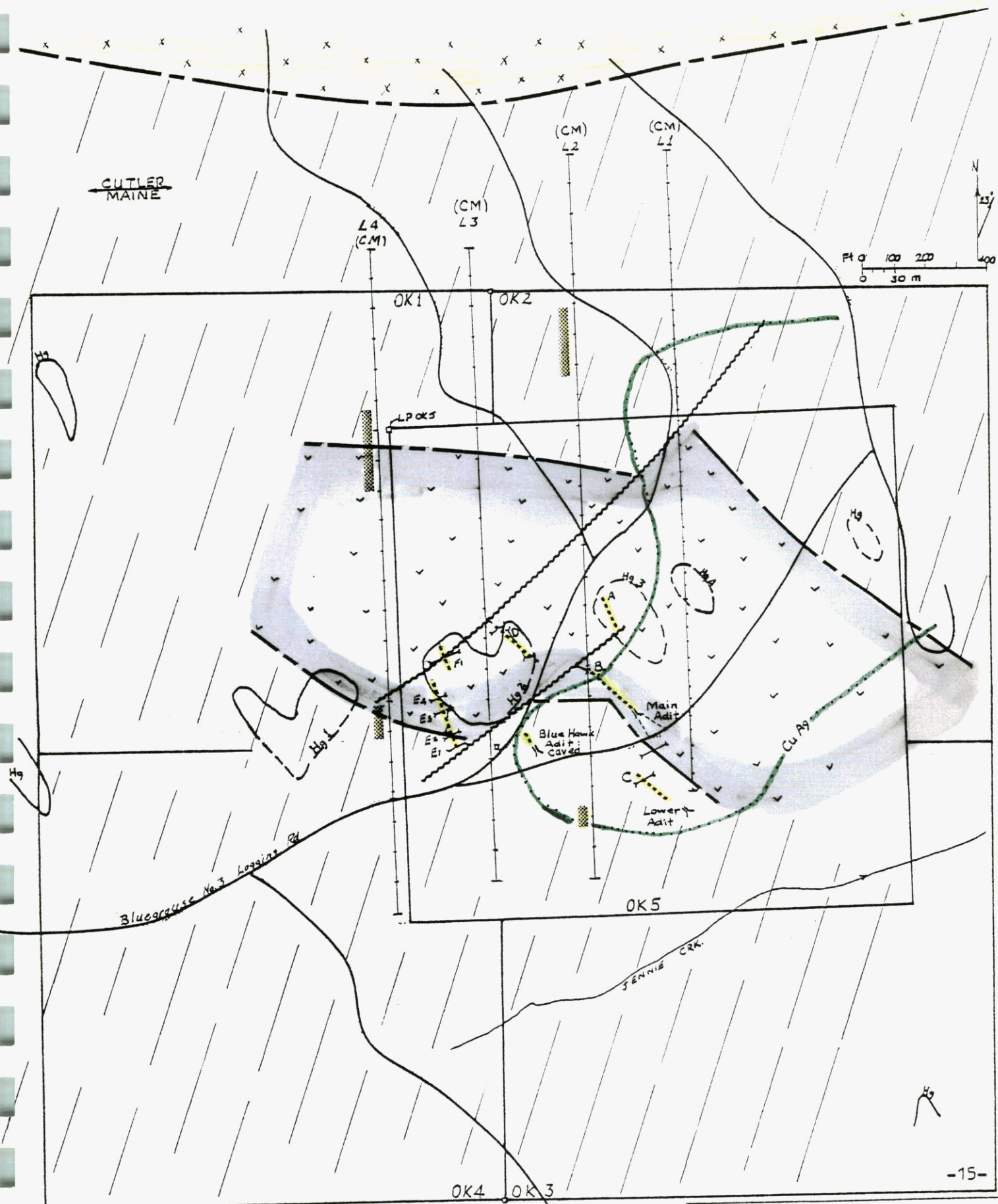
CUTLER

MAINE



REFERENCES

- Boyle, R.W. 1979 The Geochemistry of Gold & Its Deposits: Geol. Surv. Can. Bull. 280
- ..... 1968 The Geochemistry of Silver & Its Deposits: Geol. Surv. Can. Bull. 160
- Cairnes, C.E. 1937 Geology & Mineral Deposits of Bridge River Mining Camp, B.C. : Geol. Surv. Can., Memoir 13
- Church, B.N. 1973 Geology of The White Lake Basin: B.C. Dept. Min., Petr. Res. Bull. 61
- Cockfield, W.E. & Walker, J.F. 1932 Cadwalder Creek Gold Mining Area, Bridge River Dist., B.C. : Geol. Surv. Can. S1932 Pt A2, p57-71
- Emmons, W.E. 1937 Gold Deposits of the World: McGraw-Hill 1937; Arno Press, 1974.
- Gunning, H.C. 1937 Cadillac Belt, Quebec: Geol. Surv. Can. Mem. 206
- Joubin, F.R. 1948 Bralorne And Pioneer Mines : CIMM Vol. Structural Geology of Canadian Ore Deposits, p. 168-177
- \* Moorhouse, W.W. 1942 Gold Mineralization in Minor Igneous Intrusions: Econ. Geol. V. 37, No. 4, p. 318-329
- Noel, G.A. 1964 Mineral Deposits of Southeast Alaska: CIMM Symp. Vol. Tectonic History of Mineral Deposits of the Western Cordillera, p. 222
- Thompson, R.M. 1949 The Telluride Minerals and Their Occurrence in Canada : Amer. Mineralogist, V. 34, p. 342-382
- Warren, H.V., Delavault, R.E., & Barakso, J. 1964 The Role of Arsenic as a Pathfinder in Biogeochemical Prospecting in B.C. Econ. Geol. V. 59, p. 1381-1389
- Warren, H.V. 1947 A New Type of Gold Deposit in British Columbia : Royal Soc. Can. Trans. V. XLI Ser. III, Sec. 4, p. 61-72
- ..... 1946 Tellurides in Western Canada: Western Miner, June, 1946 p. 54-60
- B.C. Dept. Mines, Petr. Resources:
- Annual Reports - 1933, p. A196; 1934, p. A24, D34; 1935, p. D13; 1938, p. D36
- Assessment Reports - No. 5303 P.E. Fox, P. Eng., 1974  
No. 6734 J. Gorham, Halferdahl & Assoc., 1978  
No. 1894 W.S. Read, P. Eng., 1969  
No. 9074 N.C. Lenard, P. Geol., 1981
- \* Addenda: Little, H.W. (1958, 1959) Geology of Kettle River (West Half), British Columbia; Geol. Surv. Can. Paper 67-42
- Fraser, D.C. 1969 Contouring VLF-EM Data: Geophysics, V. 34, 6 p. 958-967



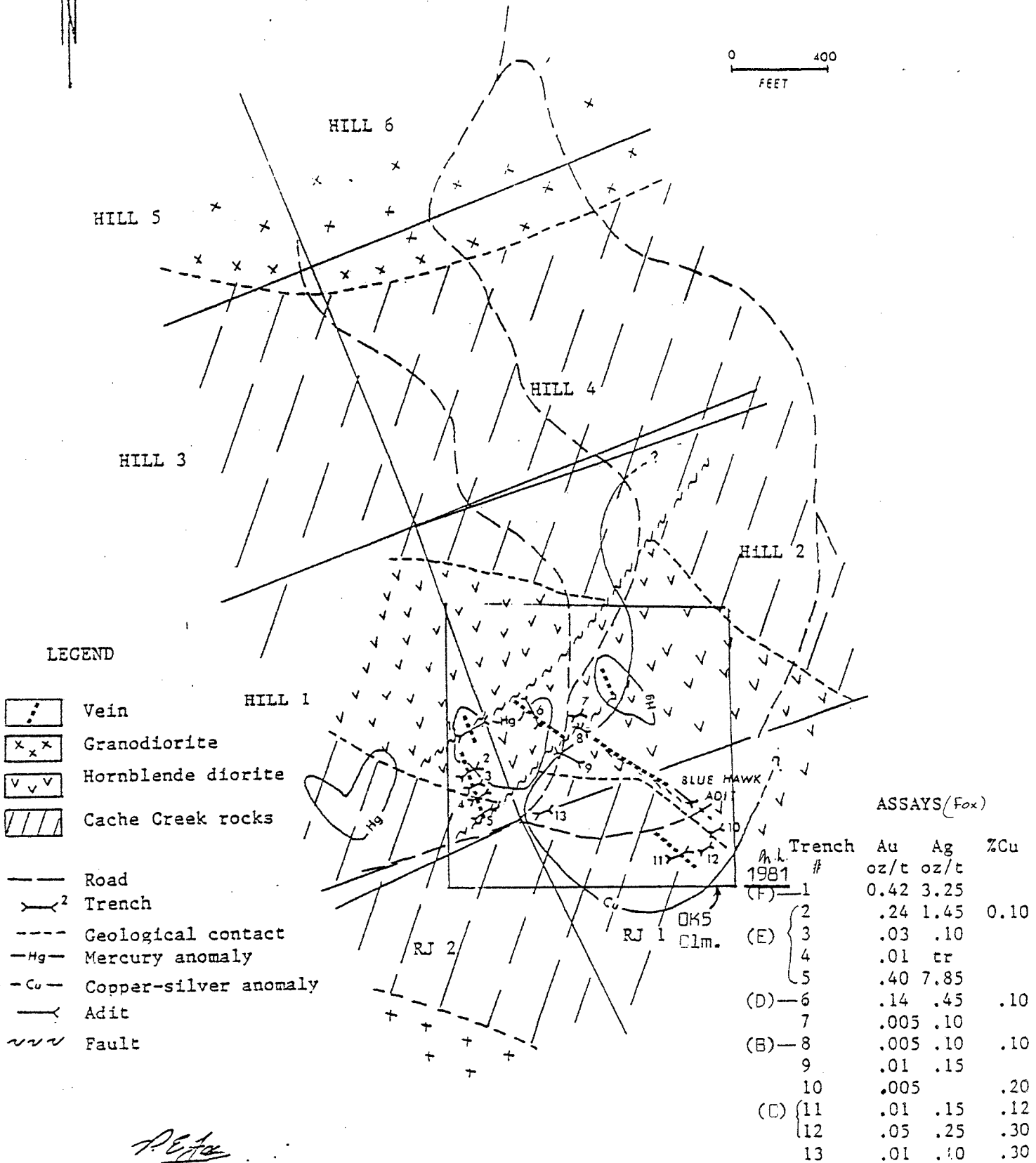
**-LEGEND-**

- |  |              |  |        |  |                                    |
|--|--------------|--|--------|--|------------------------------------|
|  | Granodiorite |  | Vein   |  | Hg2-Mercury Anom., Read 1969       |
|  | Diorite      |  | Trench |  | CuAg-Copper-Silver Anom., Fox 1974 |
|  | Cache Crk.   |  | Adit   |  | Potential VLF-EM Conductor         |
|  |              |  | Fault  |  |                                    |

**FIG. 1**  
**GEOLOGY & VLF-EM:OK1-5 CLMS.**  
 (BLUEHAWK GOLD-SILVER MINE)  
 N.C.Lenard, P.Geol. Sep. 1,  
 1981

Fig.3: To Accompany Report on OK1-OK5 Claims  
 by W.C.Lenard, P.Geol.  
 Sept.1, 1981

DAWOOD MINES LTD (NPL)  
 GEOLOGICAL PLAN  
 BLUE HAWK GOLD PROPERTY



LEGEND

- Vein
- Granodiorite
- Hornblende diorite
- Cache Creek rocks
- Road
- Trench
- Geological contact
- Mercury anomaly
- Copper-silver anomaly
- Adit
- Fault

ASSAYS (Fox)

Trench #	Au oz/t	Ag oz/t	%Cu
(F) 1	0.42	3.25	
(E) 2, 3, 4	.24	1.45	0.10
	.03	.10	
	.01	tr	
(D) 5, 6	.40	7.85	
	.14	.45	.10
(B) 7, 8, 9	.005	.10	
	.005	.10	.10
	.01	.15	
(C) 10, 11, 12	.005		.20
	.01	.15	.12
	.05	.25	.30
13	.01	.10	.30

Approved by P.E. Fox PhD. P.Eng.  
 Engineer-in-charge 2/12/74