REPORT ON

HILLER MAGNETITE PROPERTIES

<u> 1964</u>

Vancouver, B. C. January 12, 1965

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INTRODUCTION

Assessment work due on the Hiller Group at Zeballos before mid-1964 was completed during 10 days of packsack drilling on the furthest north and most accessible (weather-wise) #8 deposit. Results were slightly more encouraging than usual and the work was continued for a short period before bad weather this fall. Several new deposits were discovered in the general area of interest and a few magnetometer surveys run on these and others of the Hiller Group. No attempt was made at detailed geological mapping at this time.

Drillers during both 1964 expeditions were Schussler and Cross. The writer looked after the work on both occasions generally accompanied and helped by Roy Hepworth. Bob Mickle did the later prospecting and mag work and assisted the writer with limited surveying.

SUMMARY

Deposit #8 has been proven by drilling to be at least 300 feet long and mag work on the poorly exposed deposit suggests a length of at least twice this. Widths up to 80 feet were encountered. The copper content is within the acceptable range but the sulphur content is a little higher than anticipated.

LOCATION & ACCESS

Claim group commences at Churchill Deposit north of Zeballos and runs to the north fork of the Artlish River. Showings numbered 1-12 occur between 1600 and 3500 feet. The currently described Hiller #8

deposit is at 1700 feet elevation on Claim #22 and on Evans Creek draining northward into the North Fork of the Artlish River. The distance straight line from Zeballos is 9 miles and from the Ford Deposit (Zeballos Iron Mines) 5½ miles. (A road route would be nearly double this distance.) It is about 4000 feet north of the Hiller #4 deposit (elev. 3400 feet on the same mountain) on which previous drilling was done.

Access via helicopter or foot through heavy timber. Nearest roads are 7 miles to the north (Wolf Lake) or $5\frac{1}{2}$ miles to the south (Zeballos River). The Kacuk River road in a valley paralleling the Artlish is about 5 miles to the southwest. A proposed B.C. Government road connecting Zeballos to the outside world is due to run through Zeballos River Valley 3 miles to the east.

PROPERTY & OWNERSHIP

Eighteen located claims as a block (Hiller #1, 2, 6, 8-22).

Claims #3 to 5 were allowed to lapse as they covered Skoglund's ground.

This Fall Nos. 25 to 28 were staked to cover recently discovered deposits #10 and 12. (Map HM 6h/3). All are now in the name of Falconbridge and have or will have assessment credit ahead for several years.

Adjoining claims to the south are those of Norman Ray (Churchill) and (south central) Ole Skoglund. A block of about 30 claims staked to the north by Utah & Silver Standard in 1962 have lapsed.

HISTORY

During helicopter air mag work with snow still on the ground during 1960 we discovered and staked a number of magnetic anomalies aligned north of the Churchill and Ford magnetite bodies. These were described by the writer in reports dated 1961 and 1962. The Hiller #8

showing was discovered by prospectors Gene Evans and Dave Kimball while on a short trip out of the #4 deposit drill camp in 1962.

Prospecting work had been directed north along the Hiller Creek Fault Zone. With limited time available early in 1964, two assessment packsack drill holes were put down on the #8 deposit, this one being chosen because its relatively low elevation below fog line allowed access by helicopter at almost any desired time. The drill and helicopter crews plus the writer worked out daily from quarters at Zeballos Iron Mines. Late in the year and with the same drillers available a heliport and "one-tent" camp were constructed almost on top of the #8 showing and packsack drilling recommenced. The local area was surveyed topographically and magnetically. Prospecting still directed along the Hiller Break turned up the #12 deposit while further up the hill #'s 9, 10 and 11 were located.

DEVELOPMENT

During 1964, 10 packsack holes totalling 960 feet were put in along a very difficult 200 feet of the #8 deposit. A 50-foot hole was also drilled on the #2 claim near the Churchill (total 1964, 1010 ft.) A detailed but local mag and topog survey was made of the #8 and "pace and compass" ground mag surveys also made of the #'s 9-12 discoveries as well as several previously known occurrences including the #3 and #6 deposits and the magnetite zones immediately north of them. (Maps HM/64-2, HM/64-3 and HM/64-h included.)

The helicopter was based at Zeballos during the work period October 13 to November 8.

Earlier work (1961-62) had included 1100 feet of packsack and EX drilling (16 holes) on the #4 showing. During 1962 Skoglunds (#2) magnetite received 2500 feet of AX drilling in 14 holes while under option to Utah.

ORE

Magnetite.

GENERAL GEOLOGY

Descriptions of the area were presented in previous reports which are available for reference and such need not be repeated here.

In general, the #8 deposit occurs in altered, folded and somewhat disrupted Triassic (?) volcanic rock (Karmutsen top or Bonanza Series bottom) immediately west of a substantial thickness of westerly dipping throughgoing Quatsino Limestone. It occurs outcropping in Evans Creek along the northerly projection of the Hiller Creek Fault which parallels but lies west of the limestone contact. Granitic rock (diorite) occurs an indefinite (mile or two?) distance to the west. (G.S.C. mapping was not too accurately copied onto later topog maps). Considerable rusty weathering, thin bedded meta-sediments — representing original lime or argillite horizons, are in evidence nearby, suggesting, by definition, the much mixed up Bonanza Series.

Locally rocks involved at the moment are greenstones and dykes of andesite porphyry. A lighter altered volcanic (?) suggestive of dioritized andesite is also in evidence. Garnet and actinolite or epidote skarns are also common apparently being the result of metasomatism of a limey volcanic or the effects of proximity to the large limestone (marble) masses not too far removed from intrusive rock.

Structure is uncertain but general dip is westerly (strike northwest) and the greenstone complex is believed to follow this trend.

Local folding and faulting has occurred presumably mainly along the Hiller Creek Fault Zone. Elsewhere the Hiller deposits have been localized by cross faults occurring in favourable rock type combinations, but exposures are too limited in the #8 area to show this relation at the moment.

DESCRIPTION OF DEPOSIT

The #8 magnetite body (see Map HM/64-1 and Map HM/64-3) outcrops in the bed of Evans Creek at an elevation of approximately 1700 feet. At this point the creek, although of short drainage length, is fast and furious during the normal 10-month rainy season, especially where it cuts through the magnetite body. Outcrop is scarce, comprising less than 10% of the 1000 ft. square map area but occasional talus blocks help fill in the as yet only scantily studied geological picture.

Visible magnetite is limited to creek-cut exposures and less than 5% of the body outlined by drilling to present can be seen. This may be more real than apparent as there is a suggestion that only a small portion of the body reaches surface. One small foot-wide exposure occurs a couple hundred feet east of the creek-cut and a few stringers occur in skarnified volcanics a couple hundred feet downhill to the north. Otherwise volcanic rock and a few porphyry dykes are all that is indicated and these mostly restricted to the creek-cut areas.

Attitude and size of the #8 showing is confused but the suggestion is of a fairly steep southerly dipping, easterly striking (across the steep sidehill) body folded (drag?) near the creek. It out-

crops erratically across 80 or 90 feet and can be seen laterally (E-W) for only about this same distance. Magnetometer work clearly indicates at least 600 or 700 feet of zone length; if the body has a flat plunge, thus not outcropping, the steep hillsides (rapidly increasing caprock effect) encountered at either indicated extremity may offset the value of the magnetics here.

Drilling was designed equating time and ease of set-up and operation of the limited scope packsack drill with the geological information desired. Two reasonably accurate sections (A-A1 & B-B1) indicate a steep southerly-dipping zone, at least locally, which is probably in the order of 60 to 80 feet wide. The ten holes drilled (total 960 feet) showed iron to persist to depth of at least 110 ft. (elev. 1605 ft.) establishing a proven minimum vertical range of 160 ft. Two "along strike" limited length holes (9 & 10) testing extensions under overburden from the only feasible setups showed minimum proven length to be 185 ft. Either or both may not have penetrated through to the true footwall of the deposit as non-mineralized rock encountered could have been sill-like inclusions although the suggestion is that they did penetrate the zone. Footwall and hangingwall rocks (greenstones generally with unoriented (?) leuco-diorite and andesite dykes and sills plus minor metasediments) are little different and there is as yet no clearly defined horizon marker. However the chloritic footwall rocks offer some suggestion of difference as they are cut by numerous calcite and minor quartz veinlets and resemble the "old smoky" or current footwall rock at Tasu. Packsack holes are not long enough to establish the geological environment with any certainty at this time.

The grade of the deposit is not high because of unmineralized "inclusions" and dykes contained in the sampling (i.e. more of a minerun sampling). Impurities include pyrite and pyrrhotite with very minor chalcopyrite.

ASSAYS & RESERVES

The average assay from 639 feet of zone drilling (67 samples) in 10 holes is about 12.0% Fe (sol), 1.58% S, and 0.01% Cu. Much of the copper is contributed by a 50-foot composite of Hole #1. Copper in the remaining holes varies from 0.01 to 0.08% but sections of the footwall just beyond the magnetite zone are somewhat higher. Iron ranges in any overall included section, from about 6.0 to 62.0% and sulphur from 0.2% to 1.1%. The high sulphurs in most cases are unfortunately due to pyrrhotite but there is a general pyrite background of unknown amount at present (possibly largely marcasite variety - generally films on fractures).

Reserve more or less reasonably indicated by the limited drilling is in the order of 150,000 tons; a body 60 feet across and 600 feet long, as suggested by magnetic work, would add tonnage at the rate of about 4,500 short tons per vertical foot. The 100-foot depths so far established below the lowest outcrop would indicate probable ore at about 500,000 tons. The geometry of the magnetic anomaly (see Map HM/64-2) although possibly seriously modified by topography suggests, at least in the creek area, a minimum downdip continuance of a few hundred feet.

CONCLUSIONS & RECOMMENDATIONS

1964 work on the Hiller #8 showing has indicated the possibility of at least 1,000,000 tons of low but easily upgradeable, somewhat sulphurous

magnetite. To be interesting alone in this location two or three times this amount is required. Such may be present although not clearly indicated and underground mining would appear a prerequisite. However, in conjunction with surrounding deposits, particularly the uphill #h showing and the slightly downhill #12 untested prospect, a total of several million tens is possibly available.

With a few packsack drill holes there is no point at this stage in quoting tennage figures except that tennage required will not come easily on any of the Hiller prospects. The work this year indicates grade available, however, and there is definitely a sulphur problem in the #8. showing more so than there is on the #4.

The whole future of the Hiller area is tied around how badly Zeballos Eron Mines will need additional millfeed and how much they can afford to pay for it. Taking the Churchill property, now under option negotiations, and combining it with our Hiller property, and assuming a crude floatation mill to remove sulphur and minor copper, the writer feels 5 or 6,000,000 tons at least of 40-50% Fe available providing access to the hilly environment is feasible.

Unless underground access were provided for the Churchill, only the Hiller #8 area could be kept open all year but such a project could gear for this.

Falconbridge at the moment does not have too much experience in west coast iron mining costs but this is going to be suddenly rectified in the near future. Survivors could be called on to give a realistic approach dollarwise to the possibilities of the Hiller Deposits. If a goal were set we would have 99% more to work on as far as recommendations

go than we have now. Were surface indications of large tonnage anywhere near that noted the first day we examined Tasu, such would be easy. However such is far from the case and there are certainly no Tasu relatives in the Zeballos area. Air mag and ground impressions are not exciting but on the other hand drilling results firmly establish teasing possibilities and only more drilling can take things out of this stage. As suggested in the recently completed Churchill 1964 Report, someone a little more familiar with costs than the average geologist should be asked to come up with a set of figures after equating the complex access problem with the special case offered by Zeballos at the moment.

It is feasible to build a road to the #8 deposit and to tap
the #12 prospect en route. Given a few years at which time the government has promised a road up the Zeballos River, an all-weather, 3 or 4
mile route could be constructed through the heavy timber stands to the
1600 foot level. It is doubtful if the loggers will open this part of
the country up for a number of years, or at least until after Zeballos
Iron is dead and gone and with it opportunities for the Churchill and
Hiller deposits. Given incentive such as a possible producer in this
area, the government might be induced to speed up their Zeballos River
road, possibly with help from Falconbridge. Done early enough, this
would make this isolated community almost liveable and could not help but
lower some of the current mining costs by providing sure transportation
and communication. Following through with acceptance of this line of
thought, the following recommendations are suggested:

1. That an exploration-development group be formed by Falconbridge with the purpose of reporting on the feasibility of exploiting the Hiller

Deposits. Wright Engineers could make such a study. Until such is done, the writer feels we are batting our heads against the wall.

Our own exploration department has done enough damage in the Zeballos area already and from now on our only involvement should be advisory.

We turned down an offer from Utah to participate in such work in such a project. To abandon the area now would be to admit to incoherent thinking as little has changed since the offer was made. To do nothing constitutes abandonment in the writer's opinion.

- 2. Providing the step is in the right direction, the next stage work on the Hiller #6 should be a line of EX or AX drill holes to test the deposit at depth and along strike. The first holes should be put in from the streambed above the deposit and a good section across the body would help determine future drilling. No ore at depth of 200 and 300 feet would be fatal. A total 5000 feet minimum is required and a BBS1 machine recommended. The area must be properly surveyed with the best locations for drill holes being plotted in the field and not in the office now. If the deposit remains steep on the flanks, holes could more easily and cheaply be put in from the downhill side.
- 3. In conjunction with (2) above, the #12 prospect should be surveyed and a few short preliminary holes put in with logical followup.
- As a further generalization, deeper and flanking drilling should be done on the Hiller #h deposit, and on the Churchill. The other Hiller deposits should first be surveyed and test drilled with a packsack machine.

Equipment - One BBS1 drill - gas, and one packsack.

Crew - 2 and/or 4 drillers, geologist and surveyor.

Transportation - Helicopter, using for drill moves a 12E or equivalent from Chanagan's base at Campbell River. As and when required, a G2B from the same base for supplies. Our own machine could help haul in and distribute initial supplies, but, unless we have money to burn, our hours should be saved for exploration work.

Communications - H.F. radio communications with Okanagan helicopters and Zeballos.

Timing - considering weather

- 1. June July Hiller #8
- 2. July Hiller #1.
- 3. July August Churchill
- 4. Aug.-Sept.-Oct. Churchill, Hiller #3, 6 area.

In summary the writer feels some study such as that recommended above will be overdue this time next year and if we are ever going to do anything beyond write finis to Zeballos in the next year or two, the 1965 season is that time. Coming back to Zeballos to mine the Hiller and Churchill "gamble-type" deposits after the limited tonnage iron mine has closed cannot be envisioned by any stretch of the imagination, especially with iron ore prices losing ground.

Vancouver, B. C. January 12, 1965

J. J. McDougall, Geologist.

REFERENCES:

Hiller Iron, 1960 - J. J. McDougall (in file)

Hiller Iron, 1961 - J. J. McDougall (in file)

Monthly Reports, 1964 Field Season (in file)

Churchill Deposit, 1964 - J. J. McDougall (in file)

G.S.C. Mem. (Zeballos-Nimpkish Area) (in file)

G.S.C. Map, "Woss Lake", #1028A (included in 1960 Report)

PROPERTY	HILLER IRON
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HOLE NUMBER	H-1	
SHEET NUMBER		 ~~~~
CECTION EDOM		

Main Prospect in Creek on Hiller #22 Claim	CT A DTED
LOCATION: DEP.	STARTED April 26th, 1964
ELEVATION OF COLLAR 2000 ft. ±	COMPLETED April 28th, 1964
DATUM — ap roximate only	ULTIMATE DEPTH102 feet
DIRECTION AT START: BEARING Southwest) to be surveyed later	PROPOSED DEPTH

DEPTH FEET	FORMATION	FROM TO	OF SAMPLE	Sol		
0 - 73	80% fg magnetite replacement of	0 - 10	10.0	Iron	Ag	Cu
	, as a second of the second of	10 - 20	10.0	57.89)	
	reddish garnet - amph - skarn		**	51.86	}	
	Sarries ampri oralli	20 - 30		46.16) 1.08	.06
	- diss CP	30 - 40		52.7 2)	
	- occ pyrr - py strgs @ 50°	40 - 50		51.97	,	
73 - 90	- occ pyrr - py strgs & 50	50 - 60	**	51.54	}	
13 - 70		60 - 70	,	46.81	5	
	30% mag replacement of	70 - 80	11	26.90) 1.96	.16
	epidotized, fg, volcanic	80 - 90	11	18.72	3	
<u> </u>	av v fg diorite??	90 - 102	12.0	46.81)	
00 00	- bndg @ 55°					
90 - 98	90% mag as prev.	AVERAGE				
98 - 102	Fg Vl (volcanic - weak magnetite	102 1	t @	45.38%	Fe	
	(E N D)			.11	Cu	
				1.52	s	
	Rapid assessment work hole - to be surveyed later.	AVERAGE FOR	2 HOLES #			
		202 1	t @	38.75%	Fe	
				0.07	Cu	
				2.00	s.	

PROPERTY HTLLFR-IRON	
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HOLE I	NUMBER	Н	-	2	
SHEET	NUMBER		1		

SECTION FROM.....TO

DIAMOND DRILL RECORD

LOCATION:

DEP

ELEVATION OF COLLAR As H = 1

DATUM

DIRECTION AT START:

DIRECTION AT START:

DEP

STARTED April 28th, 1964

COMPLETED April 29th, 1964

ULTIMATE DEPTH 100 feet

PROPOSED DEPTH

DEPTH FEET	FORMATION	FROM TO	OF SAMPLE	Sol Iron	Ag	Cu	
0 - 50	80% mag repl of banded cherty sediments	0 - 10	10.0'	61.22	<u> </u>		
	and incl VI(?)	10 - 20	18	50.03	 }		
		20 - 30	59	58.53) 1.90	.03	
	- ctcts and bndg @ 65°	30 - 40	11	35.62	tr Au,	tr Ag	
	- 2% py, pyrr; sl diss CP	40 - 50	11	17.43			
50 - 65	- 30% mag in garn epid skarn	50 - 60	89	13.77)		
	- bndg @ 33	60 - 70	n	11.08	}		
	- 55	70 - 80	11	11.30_	3.06	.03	
65 - 85	20% mag repl " "	80 - 90	11	27.12	tr Au,	tr Ag	
	20,0 112,0 12	90 - 100	11	35.29	1)		
85 - 100	80% 11 11 11 11 11 11 11 11 11 11 11 11 11						
		AVERAGE	1001 @	32.13	ře		
				.03	Cu		
				2.48	5		

PROPERTY	Hiller #22	

HOLE I	NUMBER	neel	ening	of	Hole		
SHEET	NUMBER	#2	(dri 1	led	spring	of	64

П	\ T	Χ	N	Æ	\frown	ı Tı	ΙI	•	רו	D	T.	T	L	D	F	$\boldsymbol{\cap}$	O	D	ח	۱
u	′⊥	Ω	· L'	ъ.	U	щ	4 T	_	$\boldsymbol{\mathcal{L}}$	П	ı.	u.	L	n	Į.	L	$\mathbf{\mathbf{\mathcal{C}}}$	ת	ب.	,

	SECTION	FROM	 .TO
1964			
7 n			

	LAT.	AR C	. 2766	or c	TACK	DOTOM	INTIN	800	at.
LOCATION:		85 f	t. • X	97 E	from	e helij	ert		
	DEP.			1716	۵				
ELEVATION	OF	COLLA	R	4/43.					
DATUM									
						AK	-, #1	Was	\$12°E
DIRECTION	AT :	START:	DIR	90*					**********

COMPLETED.**	#	3.9	
ULTIMATE DEPTH			
PROPOSED DEPTH			

DEPTH FEET	FORMATION	FROM TO	WIDTH OF SAMPLE	sol. Fe	Cu	S	C.R.
(ct'd)		(st 82655)					
100-106	diss pyrr repl of altered basic amphibolite	100-106	6.0	31.24	0.05	3.59	100
	(call "A 1") could be a disritized tuff in part	106-109	3.0	46.11	.01	1.17	95
	- pyrr ctets # 50°	109-120	11.0	6.44	.03	0.25	90
106-120	double ctcts mag 8 43 + 55°						
106.2-109	mag., occ Cog, scattered pyrr.			-			
109-125	Epidetized V1 Skarn, greenish grey to cherty;						
	Cog patches + streaks; brecciated in pt., scatt. pyrr, sl CP, Py.						
	call "BVI" (basement or footwall volcanic)						
	(E H D)						
	Total for 109 ft of hole # 2						
	= 32.45% Fe, 0.03 Cu, 2.50% S,						
	(#1 hole was 102 ft # 45.38% Pe, 0.11 Cu, 1.52% S)				· · · · · · · · · · · · · · · · · · ·		
					-		

PROPERTY_	HILLER	#	22	
INCILATION				

HOLE NUMBER	# 3
SHEET NUMBER	1
SECTION FROM	TO

WIDTH

LAT	STADIED October 15, 1964	
LOCATION:	STARTED CCCOOK 13, 1904	
ELEVATION OF COLLAR 1732.0	COMPLETED October 16, 1964	
DATUM	ULTIMATE DEPTH. 75.0	
BEARING # 12 W DIRECTION AT START: DIP - 52		
DIRECTION AT START: DIP 62	PROPOSED DEPTH	

DEPTH FEET	FORMATION	FROM TO	OF SAMPLE	Fe	Cu	S	C.R.
0 - 7	S1. brece, disritized feldspathic V1 and ep Sk 1,	(82658)					
	greenish grey	9-7	7.0	5.69	.03	0.18	90
7 - 68	Irreg mag repl of Sk 1, Sk 2, brecc V1. Some fresh	7-20	13.0	46.91	.03	1.27	75
	"Al" sections 10-13, 60-63 cherty V1 & Sk	20-30	10.0	54.39	.05	2.07	17
		30-40	10.0	46.21	.03	1.99	16
	Mag intus scatt gobs pyrr plus pyrite (or marcasite)	40-50	10.0	32.44	.05	1.66	314
	on occ fractures.	50-60	10.0	41.52	.04	3.42	44
	Contacts 7 8 55°, 32 8 45°, (mag-Sk 1).	60-70	10.0	26.05	.01	0.41	H
	Bndg	70-75	5.0	13.27	.07	4.57	Ħ
	21 0 60° (Py) 24 0 65°, 47 0 65, 53 0 50°						
68 - 75	al mag repl of brece BV 1 & SK 2.						:
	Bndg. 74 # 64°						
10	(E N D)						
	70 ft 0 37.964 Fe, 0.034 Cu, 1.57 S						

PROPERTY	HILLER	ŧ	22	(MC)

HOLE NUMBER	4
SHEET NUMBER	1
SECTION FROM	TO

LOCATION: LAT SO ft & S 76° E from DDH # 1	STARTED
ELEVATION OF COLLAR 1739	Oct. 19, 1964
DATUM	ULTIMATE DEPTH
DIRECTION AT START: DIR	PROPOSED DEPTH

FORMATION	FROM TO	OF SAMPLE	Fe	Cu	S	C.R.
Mixed Sk 1 and dense cherty V1 followed by feld	(82666)					
+ dier. V1 - bleaching parallel occ fracture # 70°	13-20	7.0	29.24	.04	1.69	60
Mag sect repl of brecc V1 Sk	20-32	12.0	59.88	.01	.80	90
32 - 48, f g granula V1 dioritized (*) etct	32-48	16.0	10.53	.01	.16	95
32 e 55°, bndg e 38 e 35°	48-60	12.0	53.99	.05	1.33	95
85-95 epid Sk 2	60-70	10.0	49.50	.04	1.68	60
95-100 ne core	70-85	15.0	40.52	.08	2.05	90
100-112 occ "A" + Co, patches # 60°	85-95	10.0	8.38	.03	.70	60
Badg.	(95-100)	no core				0
47 0 65° (amphib - mag)	100-115	13.0	52.10	.01	.74	85
59 0 64°						
* Pyrr to py ratio appears to be about 2.5 : 1						
poor rec of greenish VI, skarn (E N D)						
Est. 100 ft @ 38.00% Fe, 0.033 % Cu, 1.14% S						
	Mixed Sk 1 and dense cherty V1 followed by feld + dier. V1 - bleaching parallel occ fracture 8 70° Mag sect repl of brecc V1 Sk 32 - 48, f g grantia V1 dieritized (?) etet 32 8 55°, bndg 8 38 8 35° 85-95 epid Sk 2 95-100 ne core 100-112 ecc "A" + Co ₃ patches 8 60° Bndg. 47 8 65° (amphib - mag) 59 8 64° * Pyrr to py ratio appears to be about 2.5 : 1 poor rec of greenish V1, skarm (E N D)	Mixed Sk 1 and dense cherty V1 followed by feld (82666) + dier. V1 - bleaching parallel occ fracture 8 70° 13-20 Mag sect rep1 of brecc V1 Sk 20-32 32 - 48, f g granula V1 dieritized (?) etet 32-48 32 8 55°, bndg 8 38 8 35° 48-60 85-95 epid Sk 2 60-70 95-100 ne cere 70-85 100-112 eec "A" + Co ₃ patches 8 60° 85-95 Bndg. (95-100) 47 8 65° (amphib - mag) 100-113 59 8 64° * Pyrr to py ratio appears to be about 2.5 : 1 poor rec of greenish V1, skarn (E N D)	Mixed Sk 1 and dense cherty V1 followed by feld (82666) + dier. V1 - bleaching parallel occ fracture # 70° 13-20 7.0 Mag sect repl of brecc V1 Sk 20-32 12.0 32 - 48, f g gran: iè V1 dieritized (?) etct 32-48 16.0 32 # 55°, bndg # 38 # 35° 48-60 12.0 85-95 epid Sk 2 60-70 10.0 95-100 ne core 70-85 15.0 100-112 ecc "A" + Co ₃ patches # 60° 85-95 10.0 Bndg. (95-100) ne core 47 # 65° (amphib - mag) 100-115 13.0 59 # 64° * Pyrr to py ratio appears to be about 2.5 : 1	Mixed Sk 1 and dense cherty V1 followed by feld (82666) + dier. V1 - bleaching parallel occ fracture # 70° 13-20 7.0 29.24 Mag sect repl of brecc V1 Sk 20-32 12.0 59.88 32 - 48, f g grant: # V1 dieritized (?) ctct 32-48 16.0 10.53 32 # 55°, bndg # 38 # 35° 48-60 12.0 53.99 85-95 epid Sk 2 60-70 10.0 49.50 95-100 ne core 70-85 15.0 40.52 100-112 occ "A" + Co ₃ patches # 60° 85-95 10.0 8.38 Bndg. (95-100) ne core 47 # 65° (amphib - mag) 100-115 13.0 52.10 59 # 64° Pyrr to py ratio appears to be about 2.5 : 1 poor rec of greenish V1, skara (E N D)	Mixed Sk 1 and dense cherty V1 followed by feld + dier. V1 - bleaching parallel occ fracture # 70° 13-20 7.0 29.24 .04 Mag sect repl of brecc V1 Sk 20-32 12.0 59.88 .01 32 - 48, f g granula V1 dieritized (?) etct 32-48 16.0 10.53 .01 32 # 55°, bndg # 38 # 35° 48-60 12.0 53.99 .05 ## 85-95 epid Sk 2 60-70 10.0 49.50 .04 95-100 ne core 70-85 15.0 40.52 .08 100-112 ecc "A" + Co ₃ patches # 60° 85-95 10.0 8.38 .03 Bndg. (95-100) ne core 47 # 65° (amphib - mag) 100-113 13.0 52.10 .01 59 # 64° * Pyrr to py ratic appears to be about 2.5 : 1 poor rec of greenish V1, skarn (E N D)	Mixed Sk 1 and dense cherty V1 followed by feld + dier. V1 - bleaching parallel occ fracture # 70° 13-20 7.0 29.24 .04 1.69 Mag sect repl of brecc V1 Sk 20-32 12.0 59.88 .01 .80 32 - 48, f g grantia V1 dieritized (?) etct 32-48 16.0 10.53 .01 .16 32 # 55°, bndg # 38 # 35° 48-60 12.0 53.99 .05 1.33 85-95 epid Sk 2 60-70 10.0 49.50 .04 1.68 95-100 ne core 70-85 15.0 40.52 .08 2.05 100-112 ecc "A" + Co ₃ patches # 60° 85-95 10.0 8.38 .03 .70 Bndg. (95-100) ne core 47 # 65° (amphib - mag) 100-115 13.0 52.10 .01 .74 59 # 64° Pyrr to py ratio appears to be about 2.5 : 1

PROPERTY	HILLER		

HOLE NUMBER	# S
SHEET NUMBER	1
SECTION FROM	TO

SG ft & S 70° E from DDH & 1	STARTED Oct. 20, 1964
ELEVATION OF COLLAR	COMPLETED Oct. 22, 1964
DATUM	ULTIMATE DEPTH. 100.0
DIRECTION AT START: DIP 64	PROPOSED DEPTH

DEPTH FEET	FORMATION	FROM TO	OF SAMPLE	Fe	Cu	S	C.R.
9 - 18	Dioritized feld V1, cherty V1, garm Sk (Sk 1),	(82674)					
	followed by mixed greenish (epid) V1 4 Sk ctct - V1	18-30	12.0	62.18	.01	.51	70
	and Sk # 8' # 74°	30-40	10.0	56.09	.01	.98	25
	16' cherty badg 0 55°	40-50	10.9	41.92	.05	2.60	50
18-100 - mag section - as prev.	50-60	10.0	48.10	.03	1.07	100	
	26 - 28 dyke or V1 reported lost etcts.	60-70	10.0	24.75	.05	2.45	100
	20' @ 64° (mag/Sk),	70-80	10.0	41.02	.05	2.71	95
	bndg.	80-90	10.0	54.09	.03	.94	95
	43 0 62° (Sk), 72 0 60°, (Sk), 75 0 58(Sk)	90-100	10.0	48.70	.03	1.41	95
	92 @ 64 (Sk)						
	py on occ fractures; pyrr mostly in impure						
	siliceous to Co ₃ breccia sections						
	(E N D)						
	Hole ended in magnetite						
	(Section 25-50 spilled in transit thus less						
	of some core)						
	82 ft 0 47.10% Fe, 0.032 Cu, 1.58% S						
		_					

PROPERTY	HILLER	#	22		

HOLE NUMBER	16	
SHEET NUMBER.	1	
SECTION FROM		

LOCATION: LAT 42' * R 55° W from DOH # 1	STARTED Oct. 23, 1964
ELEVATION OF COLLAR 1732.0	Oct. 25, 1964 COMPLETED
DATUM	ULTIMATE DEPTH 94.0 ft
DIRECTION AT START: DIP - 90°	PROPOSED DEPTH

DEPTH FEET	FORMATION	FROM TO	WIDTH OF SAMPLE	Fe	Cu	S	C.R.
0 - 25	Mag., scatt Py, pyrr bndg 23 8 40°	(82682)					
25 - 74	Lower grade mag section occ 2-3 ft sections	0-10	10.0	57.88	.01	. 82	80\$
	unmin Sk 1 & Sk 2 gen repl of VI brece + Sk	10-20	10.0	55.69	.01	. 84	12
	Bndg	20-30	10.0	58.68	.03	1.52	N
	27 @ 25°, 29 @ 30° (Py) 49 @45° - Py + jntg,	30-40	10.0	41.12	.03	.70	n
	62 0 50° (Sk), 72 0 32°	40-50	10.0	55.39	.01	1.09	67
74 - 94	- ctct 8 36° with sl brecc BV 1 - min mag as stres	50-60	10.0	35.13	.05	2.42	
		60-70	10.0	29.44	.06	2.81	F.,
· · · · · · · · · · · · · · · · · · ·	(E N D)	79-75	5.0	41.92	.06	1.37	7.5
	Best section 0 - 75 = 75 ft @ approx. 44.30% Fe,	75-85	10.0	16.27	.75	.82	- 48
	0.028 Cu, 1.44% S.	85-94	9.0	14.82	. 15	.46	6
	Total 94 ft & approx. 40% Fe.						

RTY

HOLE NUMBER	# 7
SHEET NUMBER	1
SECTION FROM	TO

42' # N 55° W from DDH # 1 LOCATION:	STARTED Oct. 25, 1964
ELEVATION OF COLLAR 1732.0	COMPLETED Oct. 26, 1964
DATUM	ULTIMATE DEPTH
DIRECTION AT START: DIP	PROPOSED DEPTH

DEPTH FEET	FORMATION	FROM TO	WIDTH OF SAMPLE	Fe	Cu	S	C.R.
0-63	Mag section	(18676)					
	24-27 - Sk 1 & Sk 2	0-10	10.0	58.48	.05	0.90	76
	61-63 - mag - BV 1	10-20	10.0	52.79	.03	1.38	60
	Badg	20-30	10.0	42.42	.06	4.12	80
	14 @ 70° (Py), 24 @ 65°, 27 @ 70°, 60 @ 63°	30-40	10.0	\$6.09	.03	1.94	90
63-74	BV 1, dioritized in part Co badg @ 72' @ 57°.	40-50	10.0	36.85	.05	.92	70
	scatt Py, pyrr, Sk 1	50-60	10.0	40.22	.04	3.11	75
		60-74	14.0	12.63	.04	0.65	90
	(E N D)						
	60 ft # 47.80% Fe, 0.040% Cu, 2.14% S						

HILLER # 22

	=	44
PROPERTY	 	

1736

BEARING ____

50 ft 6 S 70° E from DBH # 1

ELEVATION OF COLLAR

DATUM 12° E

HOLE NUMBER	* 8
SHEET NUMBER	1

DIAMOND DRILL RECORD

SECTION FROM TO

Oct. 29, 1964

STARTED

Oct. 31, 1964

ULTIMATE DEPTH

PROPOSED DEPTH

DEPTH FEET	TART: DIP	FROM TO	WIDTH OF SAMPLE	Fe	Cu	s	C.W
- 12	Cherty VI, dior VI, Sk I, etc	(18683)					
- 14	mag, ctet 0 74°	10-15	5.0	36.53	.03	0.98	65
- 23	greyish, leached V 1 - ctct 8 50°	23-30	7.0	45.21	.03	1.05	75
- 97	Mag section; repl of brecc V1, epid Sk 1 & Sk 2,	30-40	10.0	47.30	.03	1.38	90
	etc.	40-50	10.0	46.01	.96	1.71	95
	79 - 72 - f g, dark alt dyke or sill	50-60	10.0	60.98	.01	1.34	70
	75 - 94 low grade mag repl of Sk 1, epid VI;	60-70	10.0	43.51	.03	0.50	85
	amphibelite sections.	70-80	10.0	26.45	. 54	1.50	80
	Ctets	80-90	10.0	15.32	.02	0.15	85
	56' # 75°, (Sk & mag)	90-97	7.0	14.97	.03	0.08	65
	Bndg 69' # 46°, 92' # 45°	_					
	(E N D)						
	70 ft 0 approx. 43.72% Fe, 0.032 Cu, 1.20% S						
	or 87 ft # 37.36% Fe.						
A STATE OF THE STA							

LOCATION:

PROPERTY	HILLER	ŧ	22		
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HOLE NUMBER	# 9
SHEET NUMBER 1	*
SECTION FROM	TO

42° € 55° ₩ free DiH # 1

LOCATION:

DEP. 1732.0

ELEVATION OF COLLAR

DATUM

DIRECTION AT START:

DIP

42° € 55° ₩ free DiH # 1

STARTED

Nov. 1, 1964

COMPLETED Nov. 3, 1964

ULTIMATE DEPTH 50.0

PROPOSED DEPTH

DEPTH FEET	FORMATION	FROM TO	OF SAMPLE	Fe	Cu	S	C.R.
0 - 38	Mag repl of brecc V 1, Sk & Amphibelite	(18692)					
	Ctcts	0 - 10	10.0	56.09	0.01	1.09	75
	18 @ 43° (Sk - mag), 24 @ 43° (dior V I, mag),	10 - 20	10.0	52.10	0.03	2.03	90
	38 @ 46 (Sk 1 - Sk 2)	20-30	10.0	59.38	0.03	1.32	95
	Bndg 7 2 46°,	30 - 40	10.0	49.90	0.06	3.53	95
	20 - 38 higher pyrr, CP content than usual						
38 - 50	BV 1 (?)						
	Bndg						
	48 0 63° (epid Sk)						
	(E N D)						
	40 ft 0 54.36% Fe, 0.032% Cu, 1.99% S						
					· · · · · · · · · · · · · · · · · · ·		
				L			

1	HI	L	ER	#	22
- 1		-			-

	FII WARK # 22
PROPERTY	/
INOLEKT	

HOLE NUMBER.	• 10	1
SHEET NUMBER	1	

SECTION FROM.....TO

SU It & S 79" E from DDH # 1	Nov. 5, 1968
LOCATION: DEP	STARTED
DATUM	ULTIMATE DEPTH 125.0
DIRECTION AT START: DIP	PROPOSED DEPTH

DEPTH FEET	FORMATION	FROM TO	WIDTH OF SAMPLE	Fe	Cu	s	C.R.
0 - 25	Cherty V1, V1 sk., Sk 1, Sk 2 streaking in V1 e (s	tart 82692)					
	23' # 50°	25 - 30	5.0	50.50	.08	1.52	80
25-121	Mag section	30-40	10.0	46.21	.05	. 86	65
	42 - 56, 64-87	40-50	10.0	37.13	.04	1.11	95
	epid amph (Sk 2) sl mag	50-60	10.0	31.54	0.06 s	1.41	85
	Bndg # 46' # 65°, 87 # 70°, 97 A 45°	60-70	10.0	32.34	.04	.68	95
	Ctcts.	70-80	10.0	40.12	.03	1.18	100
	76 @ 70°, 116 @ 58°, 80 @ 45° (arg Sk 2)	80-90	10.0	33.53	.01	. 29	100
121-124	Sk 2	90-100	10.0	\$3.69	.01	.49	95
124-125	feld or dier V1 poss f g dierite(?)	100-110	10.0	57.09	.01	.56	95
	(0	ad 82700)					
	(E N D) (s	tart 18701)					
	95 ft @ apprex. 43.40% Fe, 0.035 Cu, 0.94%S.	110-120	10.0	51.90	.02	1.31	95
	Average indicated - holes # 1-10, = 803 ft # 42.38\$Fe	120-125	5.0	10.53	.03	.19	95
	0.04% Cu, 1.58% S (70 assays)						
	Cu/S						
		· · · · · · · · · · · · · · · · · · ·					

ELEVATION OF COLLAR STREET

DATUM X 50°E (approx)

HOLE NUMBER WC # 1 (Hiller #1)

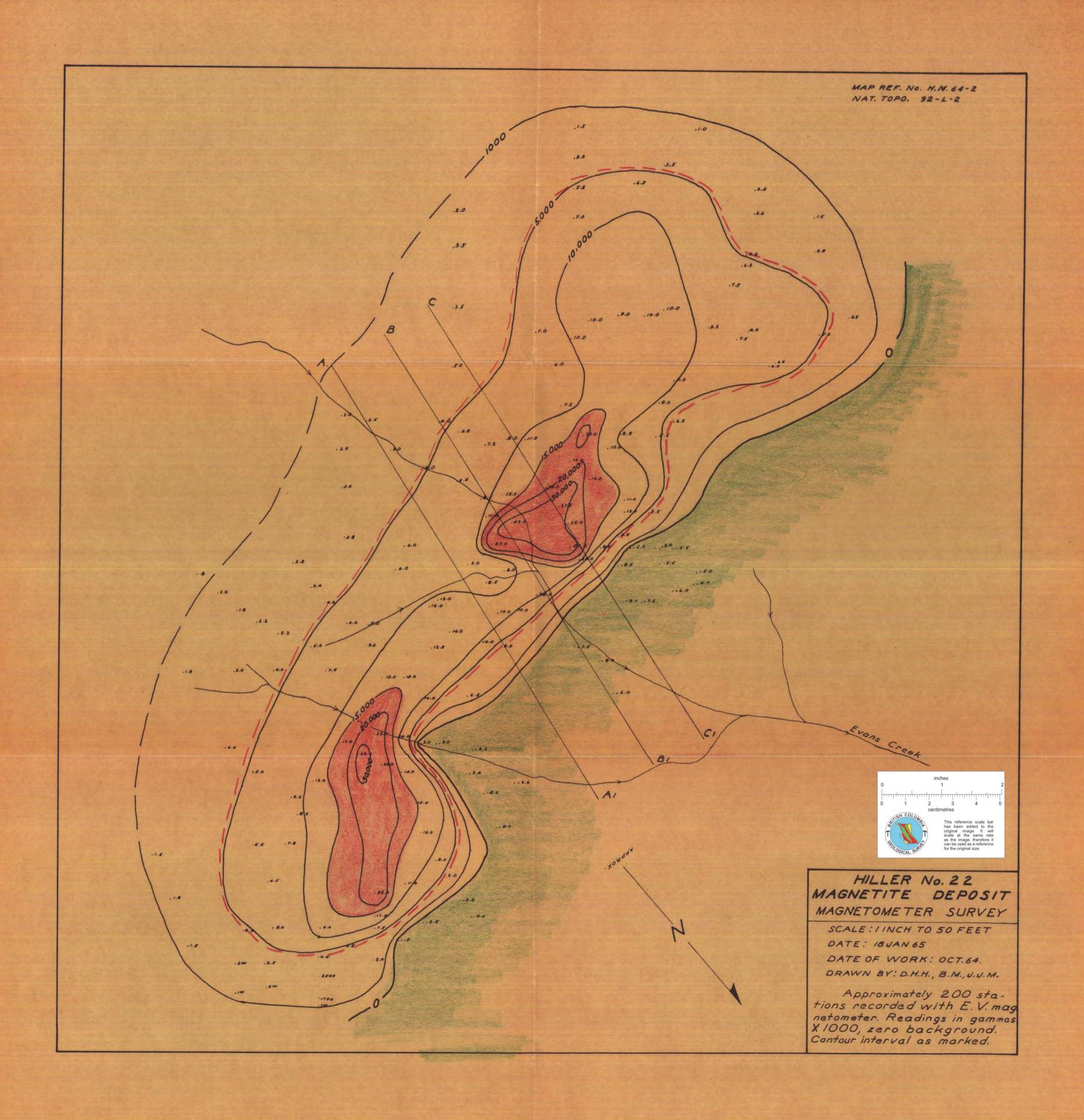
SHEET NUMBER SECTION FROM.....TO

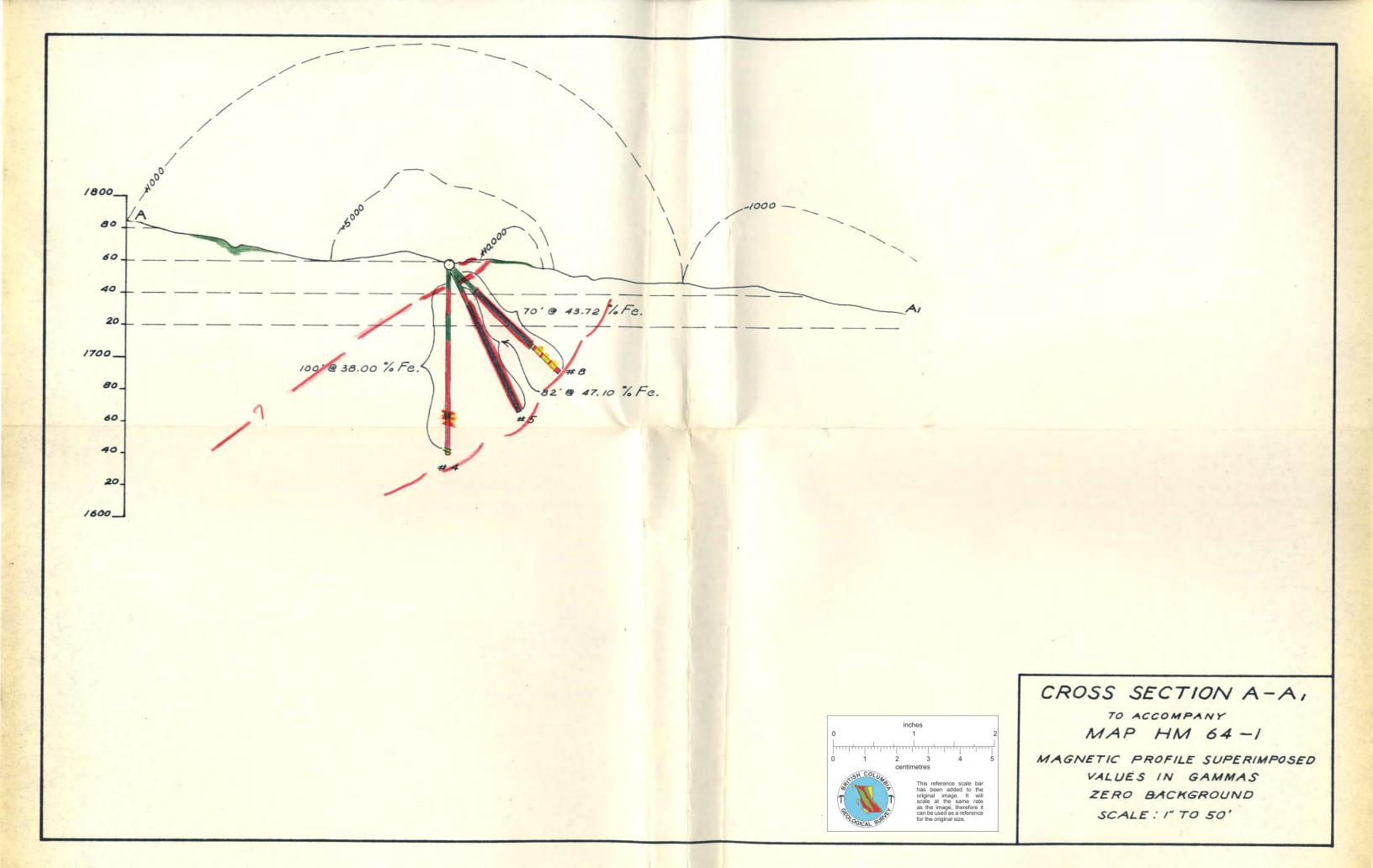
On Hiller #2MC adjacent to Church O DRILL RECORD about 600 ft. on Kaouk drainage 200 ft. LOCATION: LAT. West of small creek

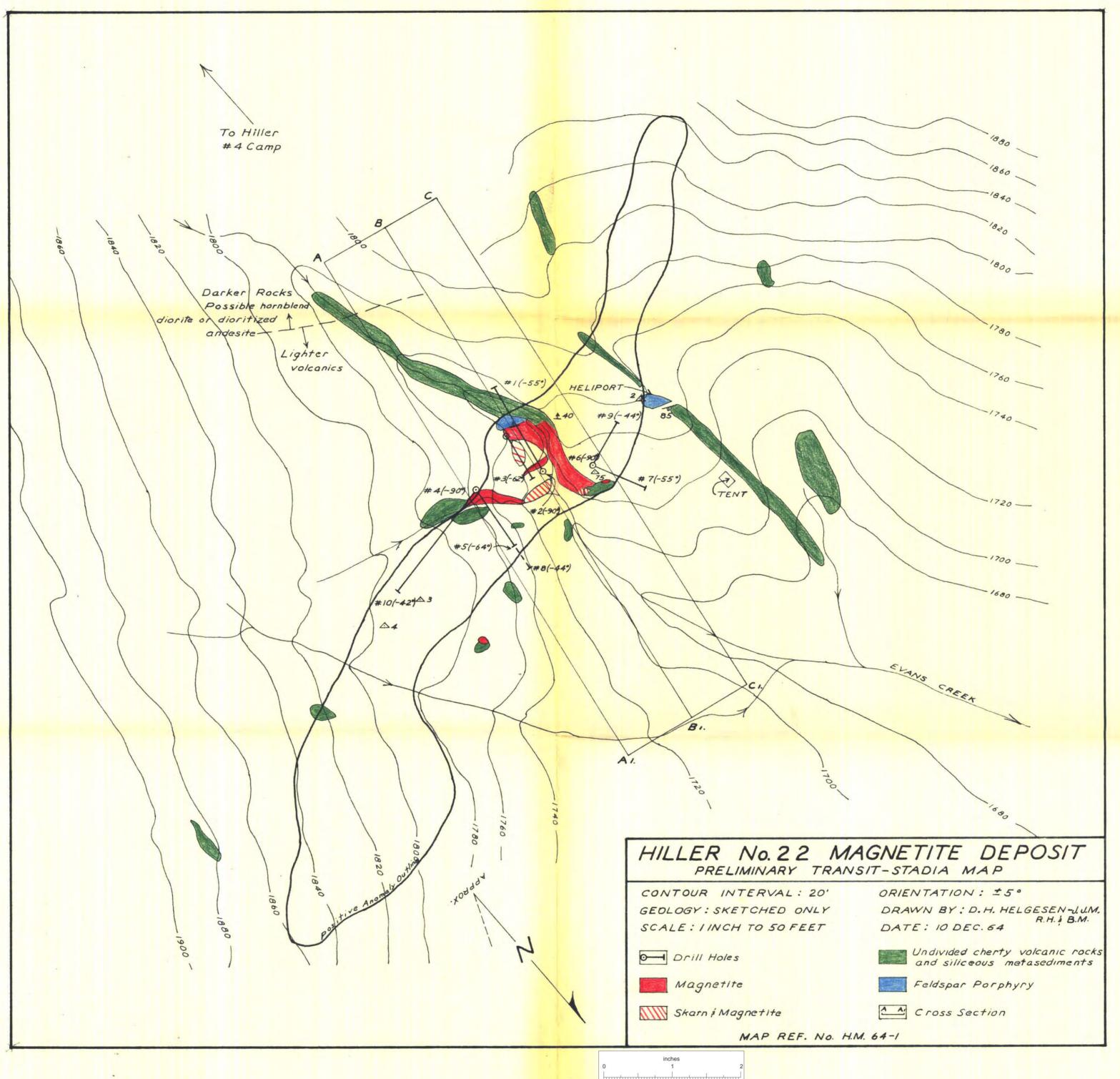
Oct. 27, 1964 STARTED

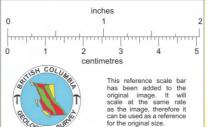
Oct. 27, 64 COMPLETED CET. 41 .

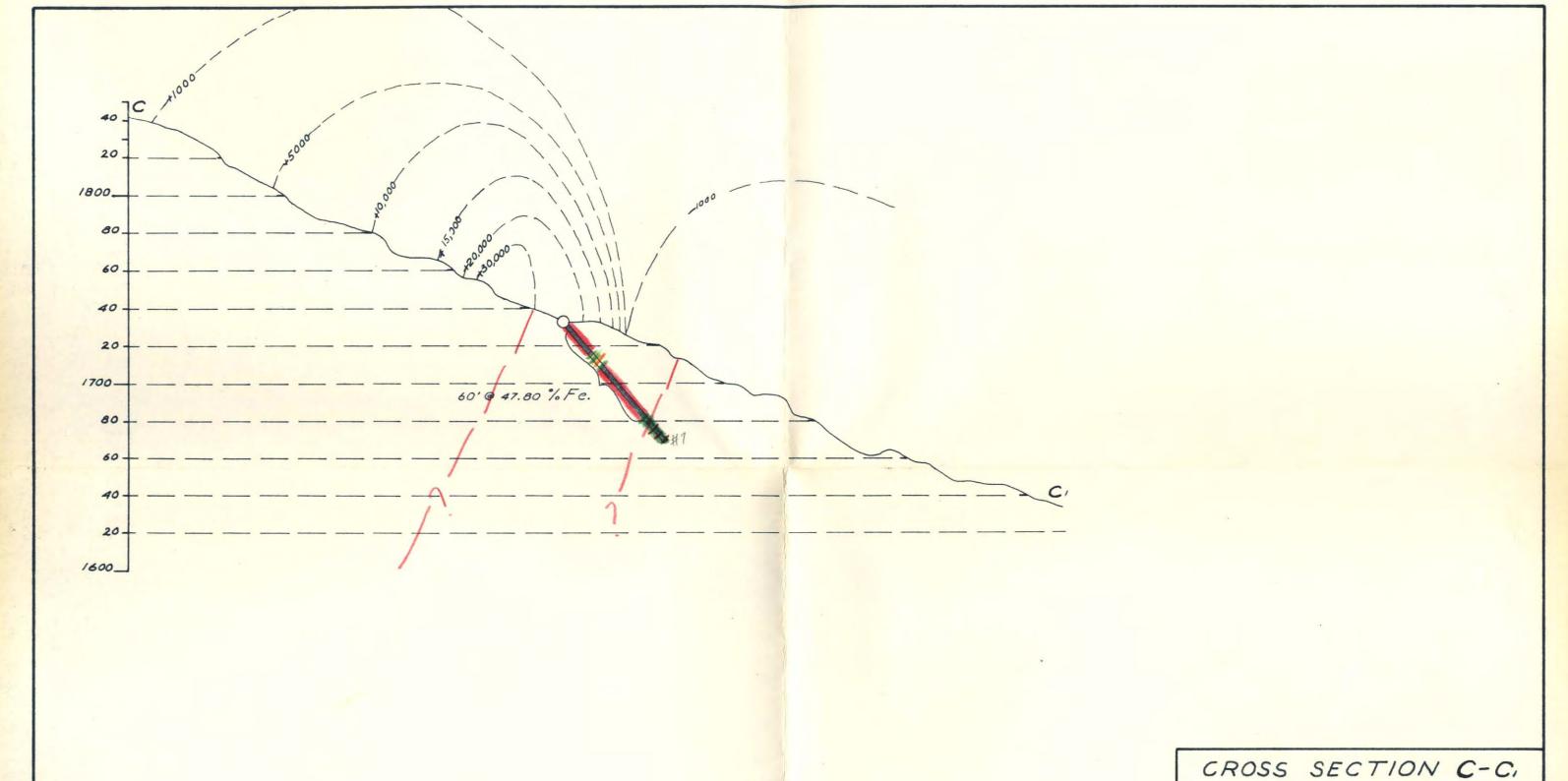
DIRECTION	BEARING SO START:	ULTIMATE DEPTH	H -4.2 F	16.			
DIRECTION AT	START: DIP	PROPOSED DEPT	TH. JS/	/TC//J.N.			-
DEPTH FEET	FORMATION						
0 - 10	Poer cere rec. in low grade mag replacement of	FROM TO	OF SAMPL	LE (Sol)Fe	Cu	3	C.R.
	brecciated liney skarn						
10 - 30		0 - 10	10.0	52.10	.03	0.21	20
	weak mag repl. of grey-green garn-epid-act-skarn (Sk 1 & Sk 2); garnet ctets # 18.5" # 50°	10 - 30	20.0	5.69	.03	0.37	
	- some feldspathized or dioritized sections	30 - 40	10.0	41.72	.05		90
	- aris - wass Wi (40 - 50	10.0	51.50	0.11	4.31	90
	- orig. rx poss VI (volcanic) call "F I".		-		V.11	7.44	90
	- 25' poor budg in epid Sk 6 73"						
- 50	- pyrr - rich 80% mag repl of brecc Sk 2as prev;						
	V sl CP, occ Co, assoc closely with nyrr-		-				
· —	badg: 8 46' 8 60°, also occ fract att.						1
							+
	(E N D)		1				
	Assessment work hole showing typical pyrrhotite		1	-			
	content of mag in Churchill area.			+		+	+
						+	
	50 ft @ 31.34% Fe, 0.05 Cu, 2.54% S.				 		
	Hiller 1964 drilling by Schussler - Cross.	+					
	/JJM				<u></u>		
	/ 94R	+			1		
							

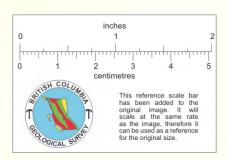












TO ACCOMPANY
MAP HM 64-1

MAGNETIC PROFILE SUPERIMPOSED

VALUES IN GAMMAS

ZERO BACKGROUND

SCALE: 1" TO 50'

