

ARIS SUMMARY SHEET

District Geologist, Prince George

Off Confidential: 89.05.13

ASSESSMENT REPORT 17426

MINING DIVISION: Cariboo

PROPERTY: Duck  
LOCATION: LAT 52 43 30 LONG 121 29 00  
UTM 10 5842541 602429  
NTS 093A11W  
CLAIM(S): Duck 3-4, Duck 8  
OPERATOR(S): Gibraltar Mines  
AUTHOR(S): Bysouth, G.D.; Barker, G.E.  
REPORT YEAR: 1988, 22 Pages

GEOLOGICAL

SUMMARY:

The Duck property is underlain mainly by metasedimentary rocks of the Hadrynian Snowshoe Group and granitic gneiss of the Devonian-Mississippian? Quesnel Lake gneiss unit. Pyrite accompanied in places by chalcopyrite occurs as strong disseminations and massive lenses in dark grey phyllites of the Snowshoe Group. Pyrite, chalcopyrite, galena and sphalerite occur in quartz veins cutting the phyllite.

WORK  
DONE:

Geophysical  
EMGR 5.5 km; VLF  
Map(s) - 2; Scale(s) - 1:5000

FILE NO:	0527	RD.
ACTION:		
FILE NO:		

VLF-EM16 ELECTROMAGNETIC SURVEY  
ON THE  
DUCK 2 CLAIM GROUP

Cariboo Mining Division  
93 A 11  
(Latitude 52 41', Longitude 121 31')

FILMED

OWNER:  
C. E. Carlson  
P. O. Box 126  
Likely, B. C.

OPERATOR:  
Gibraltar Mines Limited  
P. O. Box 130  
McLeese Lake, B. C.

GEOLOGICAL BRANCH  
ASSESSMENT REPORT

17,426

Author: G. E. Barker  
G. D. Bysouth

Submitted: May 13, 1988

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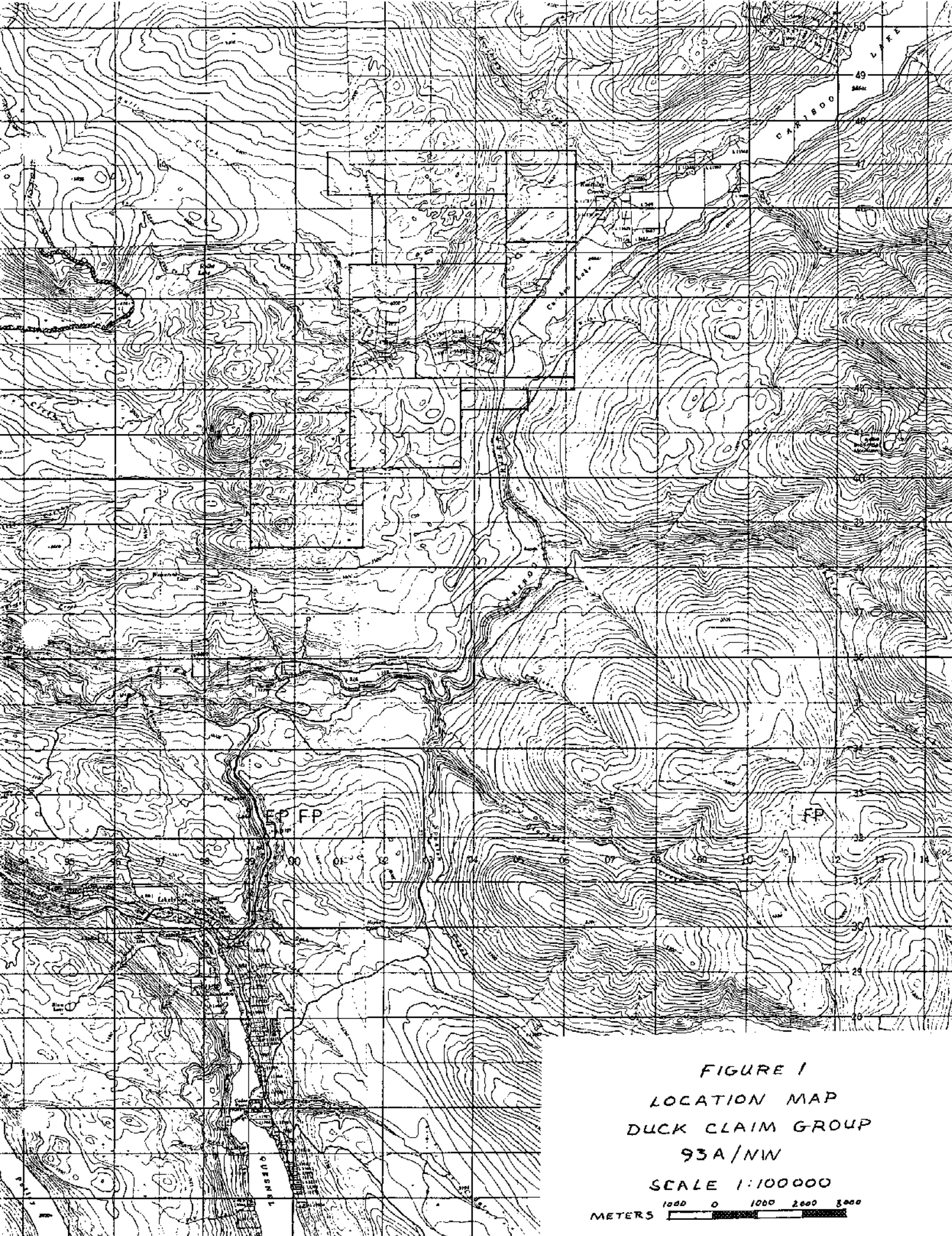


FIGURE 1  
LOCATION MAP  
DUCK CLAIM GROUP  
93A/NW  
SCALE 1:100000



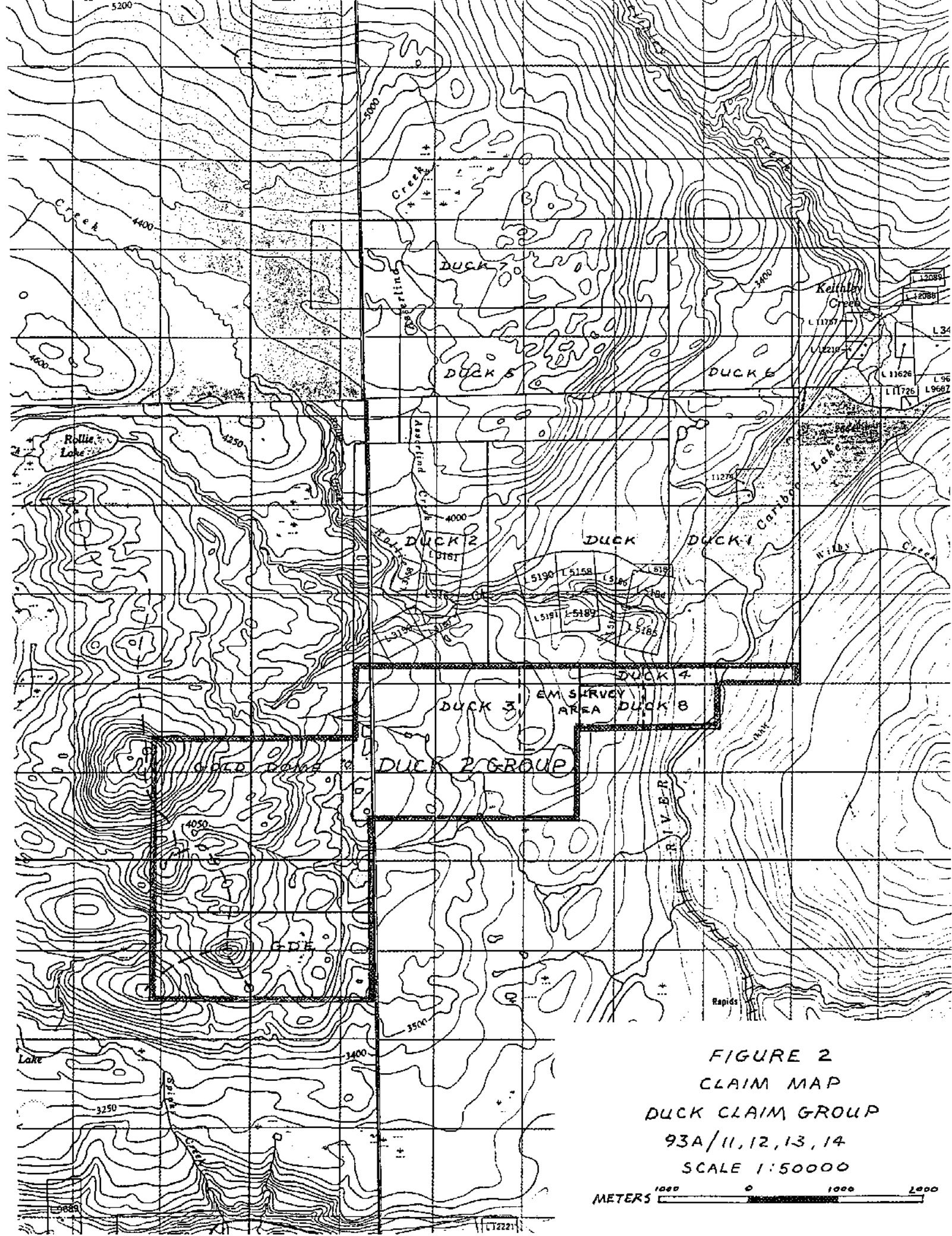


FIGURE 2  
 CLAIM MAP  
 DUCK CLAIM GROUP  
 93A/11,12,13,14  
 SCALE 1:50000



L72221

## 1 INTRODUCTION

The Duck Property is located about 1.5 km. southwest of Keithley Creek, B.C. The claims cover the lower portion of the Rollie and Asserlind Creek watersheds and also include the southwest end of Cariboo Lake. The nearest large settlement is Likely, B.C. which lies about 20 km to the southwest. Access to the claims is via the Keithley Creek road. Access within the claim group is provided by a series of logging roads.

The Duck claims were staked in 1987 by C. E. Carlson to cover sulfide mineralization observed in a succession of sedimentary rocks considered to be part of the Hadrynian to Cambrian Snowshoe Group. This report covers an E.M. 16 electromagnetic survey carried out over the Duck 3, Duck 4 and Duck 8 mineral claims during the period April 19, 1988 to May 10, 1988. A total of 5.48 km. of line were completed.

## 2 MINERAL CLAIMS

The mineral claims of the Duck Property are shown in Figure 2 and claim information is tabulated below:

### DUCK 1 GROUP:

<u>CLAIM NAME</u>	<u>RECORD NO.</u>	<u>NO. OF UNITS</u>	<u>DATE OF RECORD</u>
DUCK	8334	20	MARCH 29, 1987
DUCK 1	8335	18	MARCH 29, 1987
DUCK 2	8365	15	APRIL 16, 1987
DUCK 5	8566	18	AUGUST 14, 1987
DUCK 6	8671	12	OCTOBER 1, 1987
DUCK 7	8672	16	OCTOBER 1, 1987

### DUCK 2 GROUP:

<u>CLAIM NAME</u>	<u>RECORD NO.</u>	<u>NO. OF UNITS</u>	<u>DATE OF RECORD</u>
DUCK 3	8410	20	MAY 15, 1987
DUCK 4	8507	5	JUNE 26, 1987
GOLD DOME	8543	20	JULY 16, 1987
GDE	8544	10	JULY 16, 1987
DUCK 8	N.A.	3	MAY 6, 1988

Duck 6 and Duck 7 are currently owned by Gibraltar Mines Limited. The remainder are all owned by C. E. Carlson but held under option by Gibraltar Mines Limited.

## 3 TOPOGRAPHY AND GEOLOGY

The E. M. survey was carried out over a gently undulating hilltop terrain in which topographic slopes usually do not exceed 10-degrees. Steeper slopes occur near the baseline where the ground dips northerly into a broad creek valley, but in general, the topographic relief is still moderate and would not be expected to unduly influence the E. M. results.

Geological relations within the grid area are not adequately known due to a lack of reliable bedrock exposure. Most of the area is covered by a relatively thin mantle of gravelly till, or ablation moraine. Glacial clays were not seen and probably do not occur in sufficient thickness or extent to greatly influence the E. M. readings. Huge glacial boulders occur throughout the area, and appear in most cases, to be of very local origin. These, and the few rock exposures available, indicate the western edge of the grid is underlain mainly by a coarse grained granitic gneiss, which, to the east, is in contact with an assemblage of sheared and crenulated grey-green phyllites. These phyllites appear in places, to be mineralized with abundant pyrite. Shearing and bedding in most cases appears to be relatively flat lying.

#### 4 VLF - EM16 ELECTROMAGNETIC SURVEY

##### 4.1 INSTRUMENTATION AND THEORY

The instrument used in this survey was an E.M.16 manufactured by Geonics Limited of Missisauga, Ontario. The instrument operates within a frequency of 15 to 25 KHz. Nulling is by audio tone. In-phase measurements are taken from a mechanical inclinometer. Quad-phase measurements are taken from a graduated dial.

This method employs V.L.F. radio signals in the 15-25 KHz. range as a primary field source. The normal field from these V.L.F. stations is horizontal but can be locally distorted by many factors, the most important of which are electrical conductors in the ground. The distortion by such a conductor will cause the normally horizontal field to tilt and this tilt can be quantified by measuring the angle of null, or minimum signal, in a vertical plane, tangential to the wave front of the primary field. With this instrument, readings will be positive as one approaches the conductor and negative in moving away from it.

##### 4.2 FIELD PROCEDURES

In-phase (tilt-angle) and quad-phase readings were taken at 25-meter intervals along north trending lines spaced 100-meters apart. The V.L.F. signal from the Hawaii transmitter was employed which has a frequency of 23.4 KHz. In taking the reading, the instrument is held horizontally and rotated in a horizontal plane until a null signal is received. In this position, the instrument is pointing to the direction of the transmitting station. The instrument is then swung to a position perpendicular to this direction and readings taken in a vertical plane which in effect is tangential to the wave front of the primary field. In all cases, the operator faced southward in taking the readings. At each 25 meter station the grid coordinates, tilt angle, quad-reading and topographic slope was recorded in a field notebook. By convention the topography was taken in the same direction as the E.M. readings with negative slopes denoting downhill and positive slopes uphill.

##### 4.3 DISCUSSION OF RESULTS

No strong continuous E.M. conductors were outlined but, as shown in Figure 4, there is considerable similarity in the tilt-angle profile plots from section to section. For example between stations 50S. and 175S. on all lines the profiles show a definite positive increase before dropping off to a relatively flat, mainly negative background. This may represent a contact zone

between barren granitic gneiss, which corresponds with flat southern portions of the profiles, and weakly mineralized or graphitic phyllitic sequences, which in turn correspond with the series of weak E.M. responses along the northern portions of the profiles. The abrupt increase in positive readings just before the flat southern portion of the profile may represent a zone of shearing along the contact which in places may be mineralized with sulfides. Note that on Line 100E and Line 200E, the amplitude of the shift from positive to negative is sufficient to constitute a definite but weak E.M. anomaly.

A moderately strong E.M. response was found on Line 200E between station 0 and 25 S and may extend to Line 100E. This anomaly may be caused by a dark grey weakly graphitic phyllite unit which outcrops nearby.

5 STATEMENT OF EXPENDITURES

E.M.16 Survey - Duck Claims, 1988.

1. Field Work

G. Bysouth and G. Barker

- April 19 - 8 hrs.
- April 20 - 8 hrs.
- April 29 - 8 hrs.
- May 2 - 8 hrs.
- May 3 - 9 hrs.
- May 9 - 10 hrs.
- May 10 - 10 hrs.
- Total 61 hrs.

G. Bysouth 61 hrs. @ \$31.00/hr. = \$1,891.00  
 G. Barker 61 hrs. @ \$22.00/hr. = 1,342.00

\$ 3,233.00

2. Report Preparation

G. D. Bysouth

- May 11 10 hrs.
- May 12 10 hrs.

20 hrs. @ \$31.00/hr. = \$ 620.00

G. Barker

May 11 10 hrs. @ \$22.00/hr. = 220.00

840.00

3. Vehicle Costs

1987 4x4 rental, 7 days @ \$36./day = \$252.00  
 Fuel 140.00

392.00

4. Supplies (topostrung, ribbon, etc.)

48.00

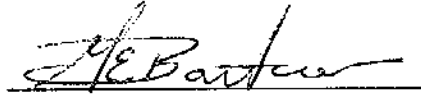
TOTAL COST

\$4,513.00



## 6 CONCLUSIONS

No targets for trenching or drilling have been established by the EM-16 survey. The weak anomalies should be further explored by geochemical rock and soil sampling techniques.



G. E. Barker,  
Exploration Geologist,



G. D. Bysouth,  
Senior Geologist,

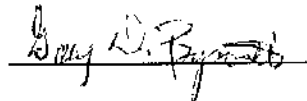
GIBRALTAR MINES LIMITED

APPENDICES

Appendix A. Statement of Qualifications

I, Garry D. Bysouth, of Gibraltar Mines Limited, McLeese Lake, British Columbia, do certify that:

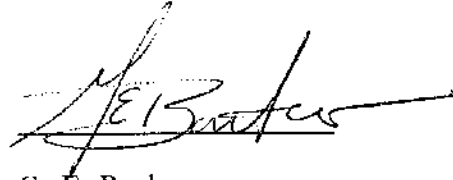
1. I am a geologist.
2. I am a graduate of the University of British Columbia, with a B.Sc. degree in Geology in 1966.
3. From 1966 to the present I have been engaged in mining and exploration geology in British Columbia.
4. I personally participated in the field work and supervised the program.



Garry D. Bysouth

I, George E. Barker, of Gibraltar Mines Limited, McLeese Lake, British Columbia, do certify that:

1. I have a General Science Degree from the University of Waterloo since 1985.
2. From 1978 to the present I have been engaged in mining and exploration geology in British Columbia.
4. I personally participated in the field work and interpreted the results.

A handwritten signature in black ink, appearing to read 'G. E. Barker', with a long horizontal stroke extending to the right.

G. E. Barker

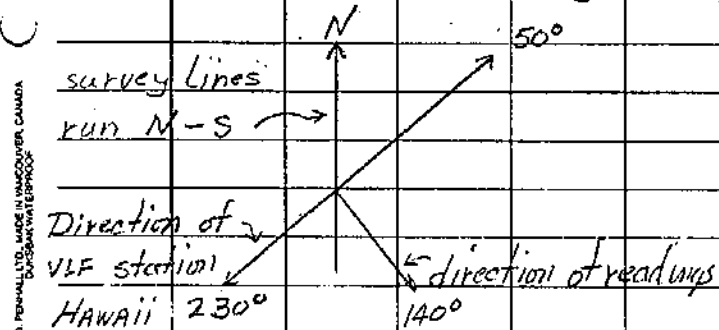
Appendix B. Field Notes

\* VLF Electromagnetic Survey

Duck 2 Claim Group

General data and definitions  
of abbreviations.

Instrument used EM16  
Operating frequency 15-25 KHz  
station used: HAWAII @ 23.4 kHz



Dist. = distance in meters along  
lines - north or south from  
base line.

L = dip angle of instrument,  
+ indicates angle above horizontal  
- " " below "

Q instrument quad

LEVEL(S)

Topo = slope of ground in front  
of direction of reading

for example:

+5 Looking up a 5° slope

-5 Looking down a 5° slope

0 flat ground

29	APR	88		①
EM SURVEY ON DUCK 4 (GEB. G.D.B.)				
Line along Duck 4 W. boundary Line				
Fix st. reading 9:30 AM 40 Q=2				
STAT. HAWAII 50°+90°=140° START OF DUCK 324 LCP				
LINE	O			
DIST.	L	Q	TOPO	REMARKS
500 mN				?
475	-12	+2		
450	-14	-2		
425	-16	-6		
400 mN	-13	-4		
375	-8	-4		
350	-4	-8		
325	0	-6		
300 mN	0	-10		
275	+2	-12		
250	+10	-18		
225	-18	-16		
200	+16 <sup>(+17)</sup>	-10 <sup>(-12)</sup>		end survey due to very bad weather
Line	O	2 MAY 88		9:30 AM G.D.B.
1.75	+12	-6	0	chlorophyll (hist)
1.50	+5	-4	-5	
1.25	+4	+6	+30	stream
LEVEL (S)				

NOT IN REPORT

R.D. PERHAPS MADE IN WOODS OVER CANALS DUCK & WATER PROOF

LINE	O (cont)		Z	MAY 88	RE	②
		Q	TOPO			REMARKS
100	+10	+4	0			
75	+12	+4	0			
50	+2	-2	+5			
25	+4	0	+10			
0	+7	-2	+5			
B/L	-4	+6	+5			B/L @ DUCK 8 LCP 25m south of DUCK 8 LCP
	+6	+8				
LINE	CODE		Z	MAY 88		
B/L	-7	+12	+10			
25 m N	+10	0	+10			
50	+8	0	+15			
76	+32 <sup>15</sup>	+16 <sup>-2</sup>	+10			
100 m N	+12 <sup>17</sup>	+16 <sup>+8</sup>	+10			
125	+10	+2	+10			
150	+15	-2	+15			
175	+15	-2	0			dark phyllite
200 m N	+22	0	+10			
225	+22	-2	0			of 10 am
250	+17	-8	0			
275	+14	-10	+25			
300 m N	+8	-12	+25			
325	-5	-8	0			swamp
350	-2	-8	0			swamp

NOT IN REPORT

Line 200 E			May 2 / 88	④
Dist	L.	Quad	Topo	Remarks
B.L.D	+28	+14		
25 N	+10	+4	+10	
50 N	-3	+6	+5	
75 N	+3	+2	+5	gasd road
100 N	+14	+1	0	
125 N	+10	+2	+5	
150	+5	+5	0-5	
175	+1	+4	+10	
200	-5	+3	+5	
225	-14	+2	+5	
250	-17	+4	+5	
275	-21	+5	+5-10	
300	-16	+1	+5	
325	-8	+2	+5-10	
350	-5	-5	+5	crk midway betw sta
375	-11	-6	-25	
400	-20	-6	-15	main road
425	-23	-6	-15	
450	-27	-3	-15	
475	-30	-4	-15-20	
500	-31	-3	-15° on pcker + N. line	
525	-9	+2	+15°	
550	0	-6	crest	

NOT IN REPORT

NOT IN REPORT

Line 200 E			Z MAY 88	⑤
575 N	+6	-6	+15	
600 N	+7	-7	+10	
625 N	+6	-1	+20	
650 N	0	-2	+10	
675 N	0	0	+10	
Line 200 E			Z MAY 88	
Baseline	-	-	-	
125S	-10	+6	-	
25S	-18	+4	+10	
50S	-10	+11	+5	
75S	-0	+13	+5	
100S	+7	+10	0	
125	+18	+12	0	top of hill
150S	-4	0	0	
175S	-13	-1	-	
LEVEL (S)				

P.L.D. PENHALL LTD. MADE IN VANCOUVER, CANADA  
DURABLE WATERPROOF

NOTE: PAGE ③ DATA NOT IN REPORT



NOT IN  
REPORT

LINE 100W			3 MAY 88		(8)
DIST	L	Q	Topo		
675	0	-10	Bottom +20	at base	gully
650	+7	-2	Top of		gully road
625	+12	0	0	wet ground	
600	+17	+2	0	"	"
575	+13	+4	0	"	"
550	+2	+2	0		
525	+6	+4	+5		
500	+6	-2	+5		
475					
450					
425					
400					
375					
350					
325					
300					
275					
250					
225	+7	-26	0		
200	+12	-26	0		
175	+16	-26	0	wet ground	
150	-10	-2	0	stream	
125	+8	+6	0	wet ground	

3 MAY 88		L100W			(9)
DIST	L	Q	TOPO		
125M	+8	0	0		
100N	-5	+4	+5		
75	0	+2	+5		
50	+5	+2	+5	stream	small gully
25	+12	+6	0		road
B/L	+14	+10	+5		
9 MAY 88					
L200W		GEB	GDB	WORKING ON EAL GR 12 DICKS	
DIST	L	Q	TOPO	Line 200W	
B/L	+14	+4	0	John day	
25S	+20	+2	0		
50S	+12	-4	0		
75MS	+17	-4	0		
100	+2	+2	+5		
125	0	+4	0		
150	+2	+2	0		
175	+2	+4	0		
200	+3	+10	+10	peg along to peg in EAL GR + 12 DICKS	
225	+2	+6	0		
250	+2	+4	0		
275	+1	+4	0		
300	0	+6	0		road
325	-2	-4			peg along to EAL GR + 12 DICKS
LEVEL(S)					

NOTE: PAGES (6) AND (7) DATA NOT IN REPORT



Line 300 W		May 9/88		(12)
Dist.	L	Quad	Topo	Remarks
0	+5	0	0	E side of cke.
25N	0	13	0	Small Swamp
50N	-3	+1	+5	E S of main rd
75N	-10	0	0	N side of rd.
100N	-14	0	0	small cke
125	-5	+2	0	
150	+2	0	0	
175	-1	-4	0	
200	-7	-8	0	
225	-10	-9	0	
250	-15	-10	0	
275	+2	-7	0	
300	+4	-4	0	
325	0	-6	0	

NOT IN  
REPORT

Line 200 W		May 9/88		(13)
Dist.	L	Quad	Topo	Remarks
0				
25N	+7	+1	+5	main rd.
50	+1	+1	+20	
75N	-2	+6	+10	
100	-14	+2	0 to -5	
125N	-8	-4	0	main cke.
150	+10	+4	-5	
175	+2	-2	-10	
200	-3	-8	-5	
225	-6	-10	+5	
250	+5	-8	+5	
275N	+2	-8	0	
300N	+2	-5	0	
325N	+6	-6	0	

NOT IN  
REPORT

R. D. PENHALL LTD., MADE IN MASSACHUSETTS, CANADA  
DURABLE WATERPROOF

LEVEL (S)

Line 0	May 9/1988	3:35 pm	(14)	
Dist	L	Quad	Topo	Remarks
0				
255	+2	+11	+15	
505	+6	+12	+5	
755	+14	+10	+5	
1005	+5	+4	+5	
1255	-1	+6	0 to +5	
1505	-2	+6	0	
<del>1755</del> 1755	-4	+4	0	
2005	0	+4	0	
2255	0	+2	0	
2505	1	+1	-5	
275	-4	0	-5	
300	-5	0	0	
325	-5	+3	0	
350	-8	+2	-5	
375	-11	-1	-5	
400	-15	-2	0	
425	-13	0	0	
450	-7	+1	0	
475	-8	0	0	
5005	-6	0	0	@ cap

Line 100E	May 9/88	(15)		
Dist	L	Quad	Topo	Remarks
0				
255	-3	+12	+5	
505	+8	+17	+10	
755	+16	+12	+5	
1005	+15	+7	0	
125	-7	+2	+5	
1505	-9	0	+5	
175	-8	+2	0	
200	-5	+2	0	
225	-5	+4	0	
2505	-7	0	-5	
275	-5	+1	-5	
300	-5	+1	0	
325	-5	+1	-5	
350	-10	+4	0	
375	-15	+1	0	
400	-14	+4	-10	
425	-11	+2	-5	
4505	-7	+7	0	
475	-7	+7	-5	
5005	-6	+2	-5	
LEVEL(S)				

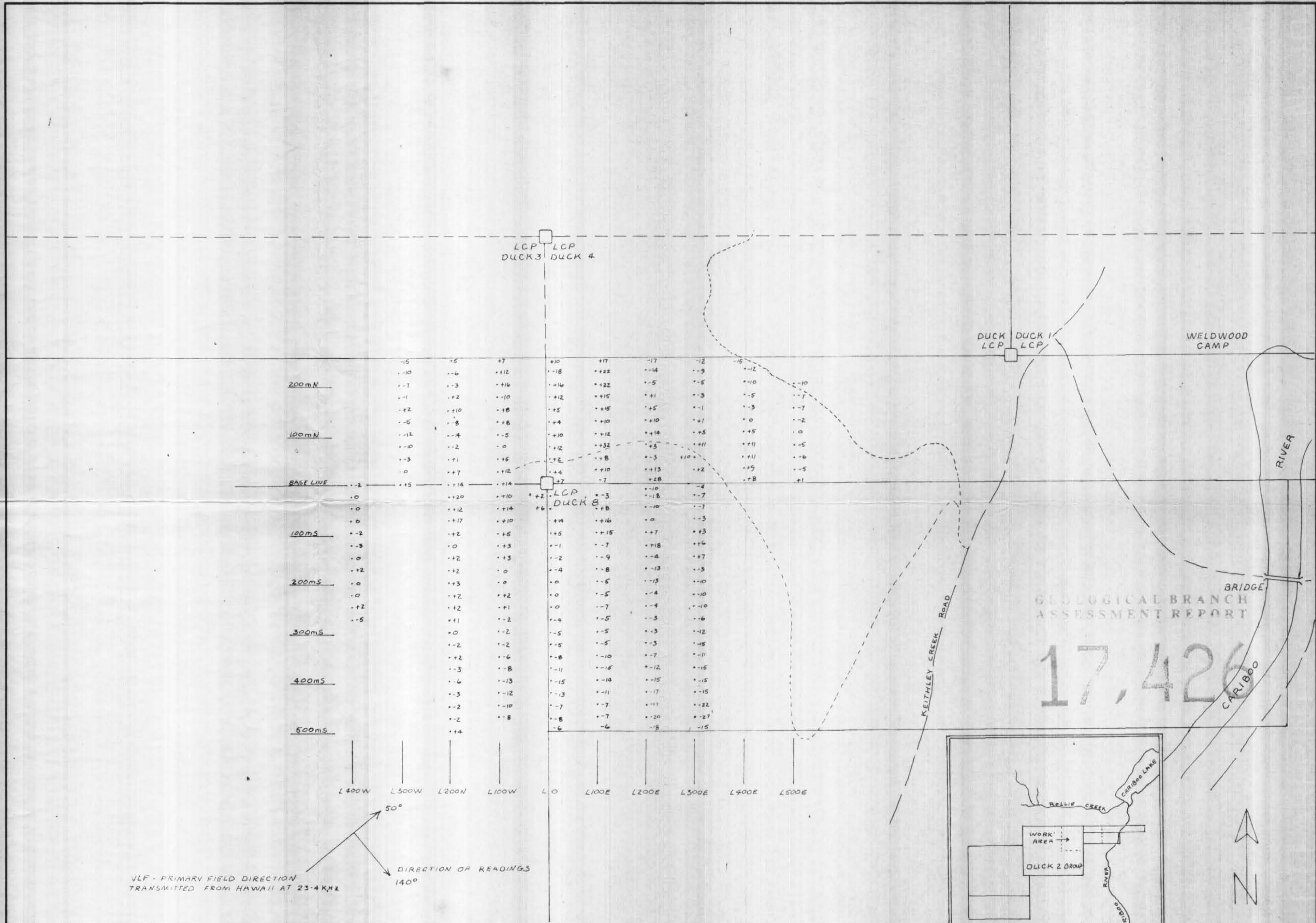


10 May		L 300 E		(18)
Dist	L	Quad	Topo	Remarks
500 S	-15		-15	
475 S	-27	-8	-10	
450 S	-22	-1	-10	
425 S	-15	-6	-5	
400 S	-15	-5	-5	
375 S	-15	-4	-5	
350 S	-11	-3	-5	22mW to line 500W of old grid and 10m S along that line to st, 250 S
325 S	-15	-2		
300 S	-12	+2		
275 S	-6	+2		
250 S	-10	+2		
225 S	-10	0		
200 S	-10	-9		
175 S	-3	-4		
150 S	+7	0		
125 S	+6	+8		
100 S	+3	+8		
75 S	-3	+10		
50 S	-7	+10		
25 S	-7	+8		
0/L S	-4	+8		
LEVEL (S)				

R.D. PERMAN LTD. MADE IN AUSTRALIA PER CANADA  
COLUMBIAN INSTRUMENTS

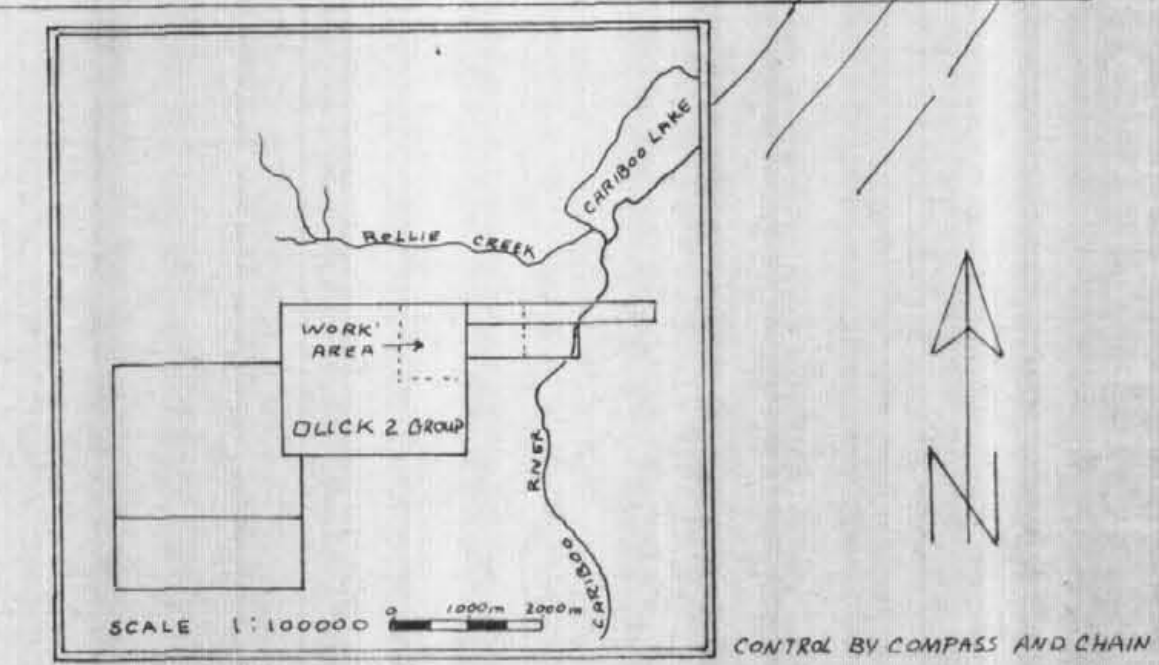
May 10		L 300 E		(19)
Dist	L	Quad	Topo	Remarks
0	+8	+11	+20	
25 N	+2	-1	+15	
50 N	+10	-1	+30	
125 N	+11	-1	+15	
100	+5	-4	+10	
125 S	+1	-1	+5	
150	-1	-1	+10	
175	-3	+3	-5	
200	-5	+5	+5	
225	-9	+9	+10	
250	-12	+3	+10	
275	-20	+3	+15	
300	-22	+6	+10	
325	-22	+1	+10	
350	-12	+5	+5	
NOT IN REPORT				





VLF - PRIMARY FIELD DIRECTION TRANSMITTED FROM HAWAII AT 23.4 KHZ

DIRECTION OF READINGS



GEB	DWN. CHECK APPR.	ISSUED FOR	DATE	REV.	DESCRIPTION	REFERENCE	No.	DWG. No.
						SCALE 1:5000		12 MAY 1988

**GIBRALTAR MINES LIMITED**

EM GEOPHYSICS SURVEY  
DUCK CLAIM GROUP

VLF-EM16 ELECTROMAGNETIC SURVEY  
PLOT OF IN-PHASE COMPONENT (TILT ANGLE)  
FILE No. FIGURE 3

NO. 210 - G.M.L.

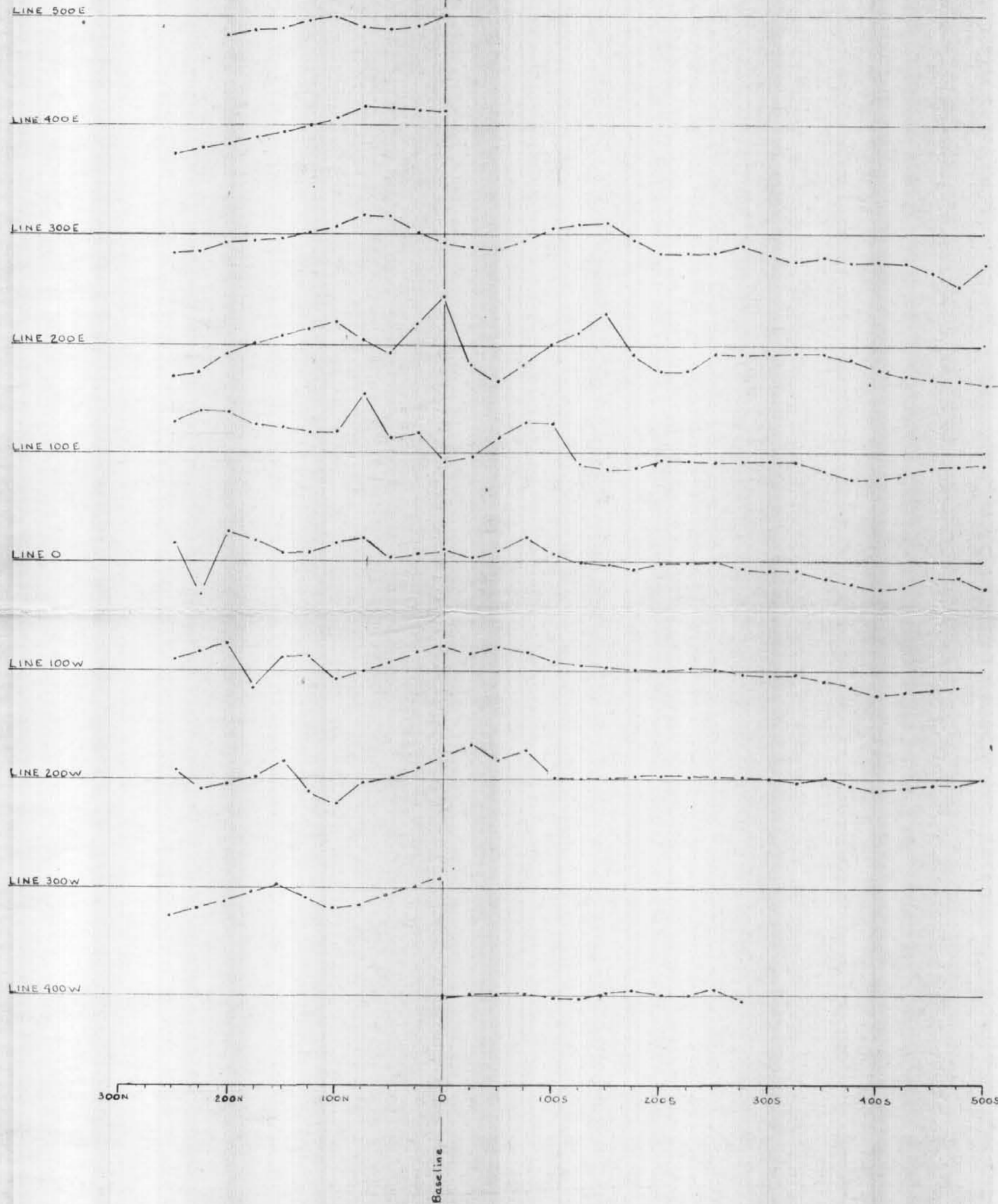


NORTH

SOUTH

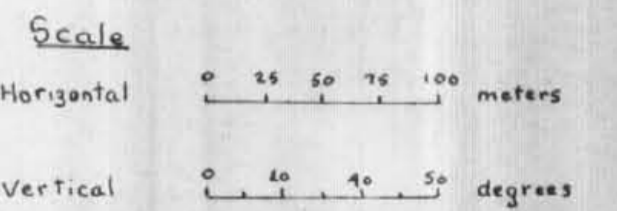
Direction of Readings →

Direction of Readings →



GEOLOGICAL BRANCH ASSESSMENT REPORT

17,426



NO.	DATE	REV.	DESCRIPTION	SCALE	REFERENCE	No.	DWG. No.

GIBRALTAR MINES LIMITED EM-16 SURVEY DUCK GROUP	IN-PHASE (TILT-ANGLE) PROFILES
	FILE No.                      FIGURE 4

NO. 270 G.M.L.

G.D.B. May 12, 1988