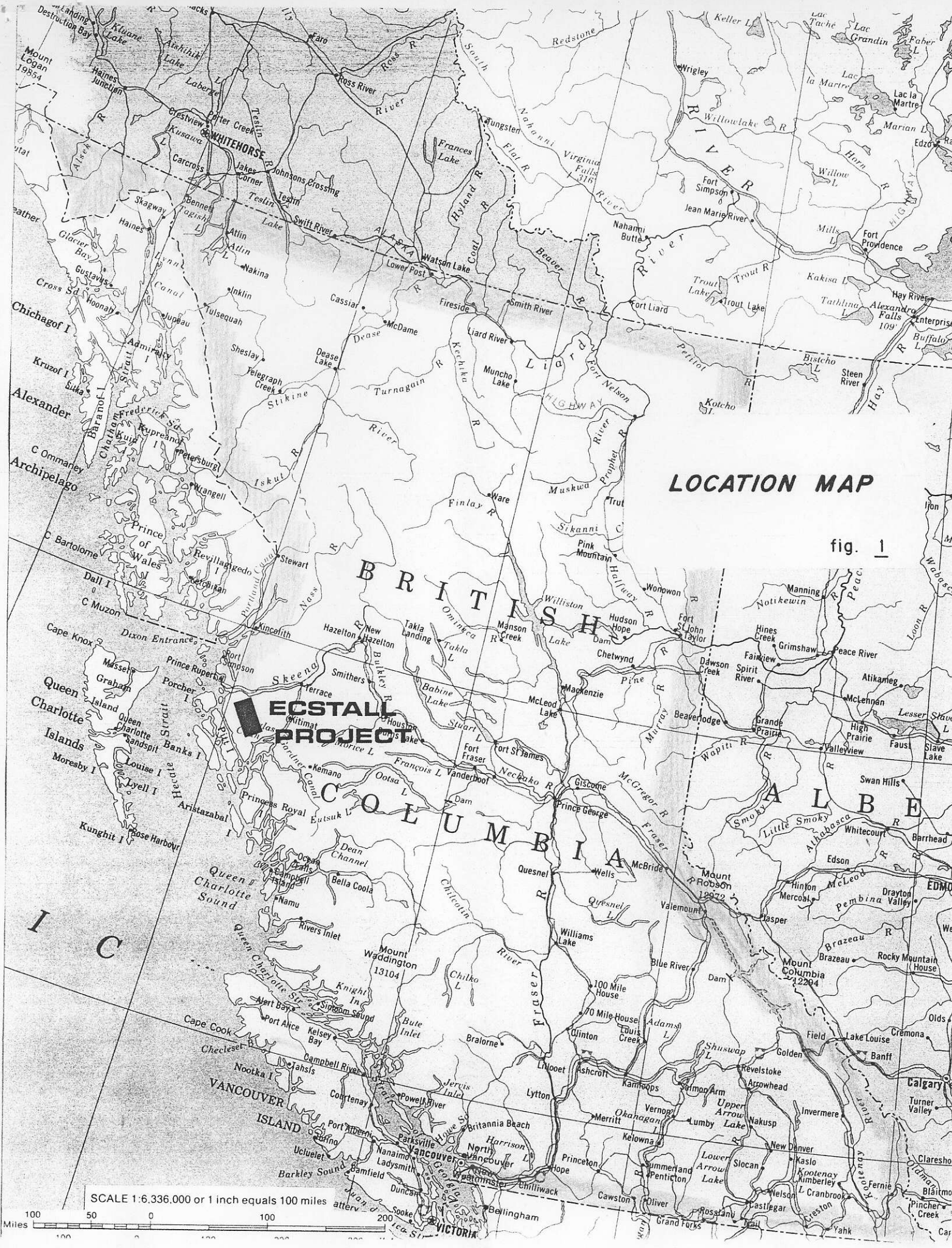


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103H/13

WELCOME NORTH MINES LTD.

ECSTALL RIVER MASSIVE SULFIDE PROJECT
PROPOSAL
FOR A
MINERAL EXPLORATION PROGRAM

January, 1981.



LOCATION MAP

fig. 1

ECSTALL PROJECT

SCALE 1:6,336,000 or 1 inch equals 100 miles

LOCATION AND ACCESS

The area to be explored lies along the coast of British Columbia extending over 100 km south from the vicinity of Prince Rupert. Logging roads occur in many of the larger valleys, but not along the Ecstall River. The coastline is incised with numerous fiords and channels, making much of the area accessible from tide-water. The field work as initially proposed herein will be helicopter-supported.

TARGET

The exploration targets are stratiform, bedded iron-copper-zinc-lead massive sulfide bodies in a belt of Mid to Late Paleozoic acid volcanics and black shales. According to G.S.C. Maps 23-1970 and 1472A, the rock units to be explored outcrop in two belts, each 75-100 km. long by 12 km. wide. It is not currently known if acid volcanics and black shales are the dominant lithologies along most of the belt.

Near the headwaters of the Ecstall River four separate massive pyrite-copper-zinc bodies occur enclosed in quartz-sericite schists, two are owned by Texasgulf Inc. The more widespread and dominant lithologies are chlorite schists and black meta-argillites. One of the two Texasgulf Ecstall deposit massive sulfide bodies averages 7.3 metres thick along a strike length of 300 metres, and extends at least to a depth of 365 metres. The second Ecstall deposit massive pyrite body has a strike length of 290 metres and a maximum of width of 36 metres. These two bodies have been drilled in 1900, 1918, 1919, 1937 and 1952, and were developed by extensive underground work from 1938 -1940.

The cumulative tonnage, drilled to date, of these two bodies is in the order of 11 million tons. Little information is available concerning the grades of the known Ecstall River deposits, published sources reveal the following:

B.C.-186 ECSTALL Texasgulf Inc 103 H/13 53°52'25" 129°30'40"	Py, sph, cp and gal as massive replacements of certain favourable beds in Palaeozoic schist, quartzite and granitoid gneiss remnant within the Coast intrusives.	1901-03: adit to 107', dd, bulk sampling. 1917-20: dd. 1923: dd, metallurgical studies. 1937-40: geoph survey, dd, new adit to 2,780' with about 1,400' of drifts and raises. 1952: EM survey and u/g dd. 1966: bulk sampling and metallurgical testing. 1975: EM survey.	Ind: 5,000,000 at 49.35% S, 42.75% Fe, 2.3% Zn, 0.2% Pb, 0.8% Cu, 0.02 oz/t Au, 0.71 oz/t Ag, including 650,000 at 1.91% Cu, 2.30% Zn, 0.03 oz/t Au, 1.0 oz/t Ag 1923 (W B Maxwell 16/04/42, British Columbia Pyrites CL) or at least 8,000,000, no grade stated 1952 (BC Bull 39, p 41, 1957)
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The other massive pyrite-copper-zinc bodies occur 10 km south in similar quartz-sericite schists. One of these (Packsack) was also diamond drilled in 1960, and reportedly has a maximum width of 15 metres and a strike length of 600 metres.

On the basis of these massive sulfide bodies, and other similar exhalative deposits around the world, particularly the Iberian Pyrite Belt in Spain, the target being searched for would contain a large tonnage of copper, zinc and silver. The potential for gold values has apparently been overlooked in the past and would be an important part of proposed exploration. The properties are close to tidewater, access is easily gained from Prince Rupert and Kitimat. The high sulphur content from clean pyrite is also an important economic consideration.

Texasgulf Inc. have been approached regarding the possibility of an option of their Ecstall Property. The company has declined interest in such a proposal for the time being, however, they have indicated that some geological data could be made available to the Ecstall Project.

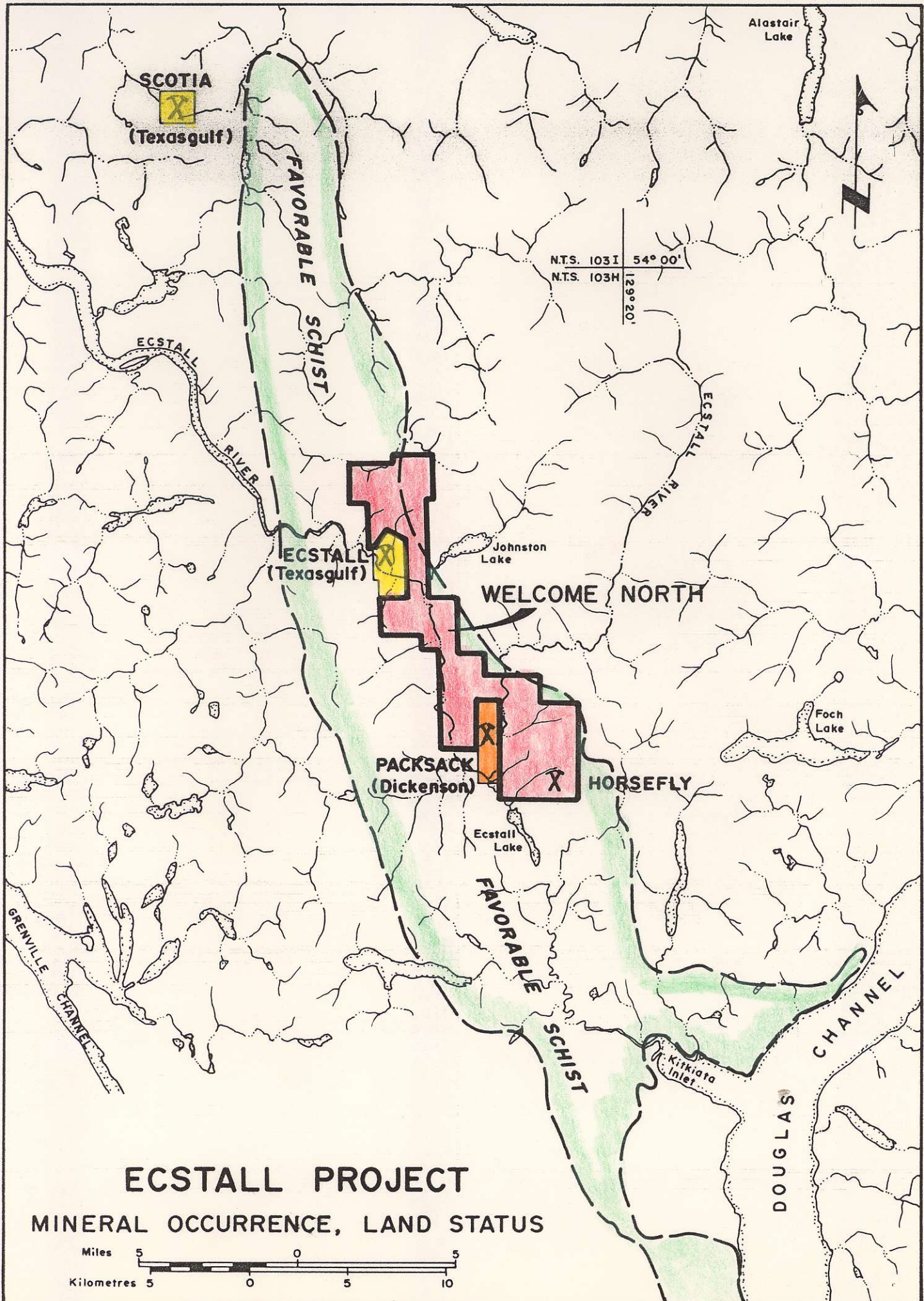
ECSTALL RIVER AREA MINING HISTORY

Mineral exploration activity began in 1900 when the Ecstall River pyrite deposits were staked. They were diamond drilled in 1900, 1918, 1919, 1937 and 1952, and had underground development during 1938, 1939 and 1940.

In 1957 Texasgulf acquired the property and has held it to the present. It consists of 22 Crown-Granted claims and a 9 unit modified grid claim. In 1957, through prospecting, they located two other similar massive pyrite deposits (Packsack and Horsefly) approximately 10 km. south. Both were shown to have significant size through ground E.M. surveys, and in 1960 the Packsack deposit had 881 metres of drilling in 11 holes. Apparently, the copper-zinc content was considered too low to be economic and the claims were allowed to lapse. The deposit is presently covered by 16 claim units which are owned by Bob Dickenson of Vancouver.

In 1966, Texasgulf reopened the adits on the Ecstall deposit and took a bulk sample for assay and metallurgical testing. The results of this study are unknown although through personal communication with Texasgulf it appears that the sulphur content is of economic interest to that company. Subsequent work has consisted of geophysical surveys on the Ecstall deposit for assessment purposes.

Welcome North in late 1980 staked the fourth known massive pyrite body (Horsefly) and the entire belt underlain by favourable lithology between the Ecstall deposits and the Packsack-Horsefly area 10 km south. The total number of claim units is 257. It is proposed that the claims be evaluated for massive sulfide deposits by airborne magnetic-electromagnetic surveys, prospecting and stream, silt and soil geochemistry.



ECSTALL PROJECT

MINERAL OCCURRENCE, LAND STATUS



GEOLOGY

The geology of the southern half of the area is contained in G.S.C. Paper 70-41, Douglas Channel-Hecate Strait map area. The geology of the northern half is described in G.S.C. Paper 66-33, Prince Rupert-Skeena Map area, and on accompanying G.S.C. Map 12-1966. G.S.C. Map 1472A is a new revised geology map of the Prince Rupert area.

Much of the area on the two map sheets is underlain by Coast Range plutonic rocks and high grade metamorphic rocks of the Central Gneiss Complex. Two narrow, elongate belts of schistose volcanic and sedimentary rocks occur as remnants or roof pendants on the crystalline rocks, and are considered to be favourable exploration targets. These rocks outcrop in two separate belts, each roughly 12 km. wide by 75-100 km. long.

The dominant lithologies of the favourable belts are chlorite schists, sericite schists, hornblende schists, black graphite schists, quartzites, argillites and marble.

The age of these rocks and their associated mineral deposits is Devonian to Mississippian based on correlations with similar rocks on adjacent Prince of Wales Island in the Alaska Panhandle.

The massive pyrite deposits previously described were formed as sulfide exhalations from hot spring associated vents around the flanks of submarine volcanoes. The minerals are carried from depth into the seawater by hot spring waters, from where they settled into pools and depressions and eventually accumulated into significant sized deposits. Similar processes are going on at the present time in the Red Sea, and along the Galapagos Rift. Elsewhere in the world, deposits of the Iberian Pyrite Belt of Spain appear to be similar in many respects to those of the Ecstall River area.

There has been a lot of success in Spain in the past 20 years searching for hidden ore bodies, particularly in the immediate vicinity of the known deposits, and over 500 million tons of new reserves have been discovered. It is thought that hidden deposits should exist in the vicinity of the known Ecstall River area deposits and that some of the techniques developed and used in Spain could be successfully applied here.

LAND POSITION

As previously explained, the Ecstall deposits are covered by 22 Crown-granted claims and one 9-unit modified grid claim which are owned by Texasgulf Inc. The Scotia property, located northeast of the Ecstall deposits is also owned by Texasgulf who plan to explore that property in 1982. *Northwest*

The Packsack deposit is covered by one 16 unit modified grid claim which is owned by Bob Dickenson of Vancouver. The Horsefly deposit and all of the intervening ground between the Ecstall deposits and the Horsefly-Packsack deposits 10 km south is covered by 257 units of modified grid claims which are owned by Welcome North.

EXPLORATION TECHNIQUE

Phase I (1981)

The exploration program will consist of a helicopter borne magnetic-electromagnetic survey followed by stream silt sampling, geological mapping and prospecting. This work will be concentrated on presently held claims, but some reconnaissance prospecting will also be carried out along the entire length of the belt of favourable rocks. The stream silt samples will be analyzed for copper, zinc and lead. Soil sampling will also be carried out over favourable areas that are outlined by the airborne geophysical program, mapping and the stream silt sampling work.

Phase II (1982)

Areas anomalous in copper, zinc and lead and underlain by favourable acid volcanics would be further investigated by ground geophysical surveys prior to drill testing.

ECSTALL PROJECT

EXPLORATION BUDGET 1981

1. ASSAYS	Geochemical 1000x 5.00 ea.		5,000
2. CAMP COSTS	180 man days x \$25/man/day	4500	
	Camp Rental	2000	6,500
3. CONSULTING	Senior Field Geologist		
	80 days @ \$200/day	16,000	
	Consultant 10 days @		
	300/day	3,000	19,000
4. DISTRICT COSTS	Expediting, radio tental		1,500
5. FIELD EQUIPMENT	Maps, supplies		3,000
6. FUEL	Included in helicopter charges		
7. AIRCRAFT	Fixed wing support	5,000	
	Helicopter 150 hours		
	@ \$250/hour	37,500	42,500
8. SALARIES	2 Assistants 2 months		
	x 1200/month	4,800	
	Drafting	2,000	6,800
9. TRANSPORTATION	Airlines	1,500	
	Travel	1,500	3,000
10. GEOPHYSICAL SURVEYS	A.E.M. (Apex)		68,000
11. ADMINSTRATION AND OVERHEAD @ 10%			<u>15,000</u>
			<u>\$170,300</u>
			=====

ECSTALL PROJECT - CASH CALL SCHEDULE

	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL
ASSAYS			2500	2500						5000
CAMP			4000	2500						6500
CONSULTING	2000	1000	6000	4000	3000		3000			19000
DISTRICT		800	400	300						1500
EQUIPMENT	2000	1000								3000
AIRCRAFT			20000	22500						42500
SALARIES			2400	2400			2000			6800
TRANSPORT			1500	1500						3000
GEOPHYSICS	68000									68000
ADMIN	7000	300	3700	3200	300		500			15000
	79000	3100	40500	38900	3300		5500			170300

CASH CALL SCHEDULE

APR. 1	82,100
JUNE 1	79,400
AUG 1	3,300
OCT 1	5,500
	<u>170,300</u>

Excerpt from :

Minister of Mines
Province of British Columbia
Annual Report - 1952

ECSTALL RIVER*

Pyrite-Zinc-Copper

Ecstall (Sulgas Properties Ltd.) (53° 129° N.W.) Sulgas Properties Ltd. is a private company, incorporated in 1951. Company office, 744 West Hastings Street, Vancouver. Directors: F. W. Guernsey, Vancouver; R. D. Molison, H. R. Brainerd, B. G. Bedichek, all of New York. Capital: 2,000 shares, \$100 per share. The Ecstall property consists of twenty-one Crown-granted claims and fractional claims which extend across the Ecstall River at a point 30 miles above its confluence with the Skeena River. The property is 45 miles southeast of Prince Rupert.

Large pyritic deposits on the Bluestone and Bell Helen claims have been investigated intermittently during the past fifty years. These two claims and the Red Bluff and Red Gulch comprise the original group located in 1900. In that year the property was purchased by Victoria interests and the British Columbia Pyrites Company Limited was formed. This company spent two years investigating the deposits by tunnels and drill-holes. A small shipment of pyritic material to the Victoria Chemical Works contained 48 per cent sulphur.

The property was idle from 1903 until 1917, when The Granby Mining Smelting and Power Company Limited, with a new smelter at Anyox, 110 miles north, took an option on the ground. Granby drilled the deposits in 1918 and 1919 and then dropped the option; a second option was obtained in 1923 but, after additional drilling, this, too, was dropped and the property reverted to the Victoria owners.

In 1937 the property was acquired by American interests represented by F. W. Guernsey, Vancouver. In that year Northern Pyrites Ltd. was formed and some diamond drilling was done to check the results of previous drilling. In 1938 underground development was begun, and by 1940 the new workings consisted of a 9- by 8-foot adit 2,780 feet long, seven crosscuts totalling 725 feet in length, and a 600-foot raise to surface.

No further work was done on the property until the summer of 1952, when the present company, which represents the same interests as did Northern Pyrites Ltd., engaged in a vigorous programme of further exploratory work. This included 1,378 feet of surface drilling, 8,880 feet of underground drilling, and geological reconnaissance of a considerable area surrounding the ore occurrences. In addition, geophysicists, using

* By W. R. Bacon.

a new low-frequency electromagnetic method, carried out experiments in the immediate vicinity of the known deposits.

The Ecstall River traverses an exceedingly rugged part of the Coast Range. Throughout much of its length the river has a low gradient and is shallow, flowing over and around innumerable sandbars. Tides are effective to the western boundary of the property, and at high tide boats of shallow draught, such as the average salmon troller, can reach the landing constructed at this point. From the landing an old tramway, 2,250 feet long, leads directly to the adit and mine buildings on the Red Gulch claim.

The deposits are in the canyon of Red Gulch Creek, a stream that flows due south into Ecstall River. Their regional setting is a northerly trending remnant of metamorphic rocks intruded by granitic rocks of the Coast Range. The metamorphic rocks occur on either side of the river and have been traced for 6 miles in a north-south direction. The remnant is 3 miles wide at the Ecstall River.

On the eastern slope of Red Gulch Creek good exposures of bedrock occur in half a dozen narrow gashes cut by intermittent tributary streams. The main rock type is a dark greyish-green, carbonatized chlorite-biotite schist in which there are bands of arenaceous limestone, quartzite, and dark-grey argillite. Sparse outcrops of chlorite-biotite schist occur immediately west of Red Gulch Creek.

The rocks in Red Gulch Creek are distinct from those that flank it. They form a band that has a maximum width of approximately 600 feet. These rocks are, at least in part, metamorphosed sediments consisting of quartz-biotite-chlorite schists, quartz-hornblende-chlorite schists, quartzite grading to quartz-mica schist, minor black argillite, and a granitic gneiss.

As shown in Figure 2, the granitic gneiss occurs in a band east of the deposits. This rock is called a granitic gneiss rather than a gneissic granite because certain facts suggest that it is a metamorphic rock. Two specimens examined petrographically consist of abundant quartz, biotite, plagioclase, muscovite, chlorite, clinozoisite, and minor carbonate and pyrite. The alignment of the micas and chlorite is strong, and the quartz grains are elongate parallel to the foliation. Plagioclase comprises less than 20 per cent of the rock or about one-third the normal content of Coast Range granodiorite. This and the lack of igneous texture is considered evidence that the gneissic band is probably of sedimentary origin and not a sill. For comparative purposes, a specimen of the Coast intrusives was obtained from a point just east of the eastern border of the metamorphic remnant. Although strongly gneissic, it is quite distinct from the rock described above. It is a granophyric rock composed of abundant andesine, hornblende, biotite, quartz, and minor potash feldspar.

In the vicinity of the deposits the rocks strike northward and dip eastward at 80 degrees or more. The secondary foliation is parallel to the bedding.

The deposits are massive sulphide replacements. The two main deposits are known as the North lens and the South lens, but, with the exception of the northern part of the North lens, these bodies are more tabular than lenticular. The mineralization consists of medium to coarse pyrite, minor sphalerite and chalcopyrite, and minute amounts of pyrrhotite and galena. Because of the granular nature of the pyrite, the mineralized outcrops tend to disintegrate readily.

The in echelon relationship of the North and South lenses is evident at the surface (see Fig. 2) and in the underground workings. These bodies conform to the attitude of the enclosing sediments and are relatively complete replacements of certain favourable beds. Although the nature of the replaced rock is not definitely known, three blocks of quartzite were noted within the northernmost exposures of the North lens.

The possibility that the two bodies occur in the same stratigraphic horizon was considered and rejected. Where best exposed (in Nos. 3 and 4 crosscuts), the rock between the two bodies exhibits no evidence of a fault or tight fold.

Steeply plunging corrugations of unknown significance are not uncommon in the schistose rocks enclosing the deposits. Actual dragfolds are much less common. Dragfolds occur in the northern part of the North lens, where, in places, they can be traced in spite of the massive nature of the mineralization. Some are marked by thin bands of unmineralized sericite schist. These dragfolds plunge at 70 degrees in a south 33 degrees east direction and have been responsible for an appreciable thickening of the favourable horizon.

Sericite schist is found sporadically along the margins of the deposits. A band of this schist 40 to 50 feet wide can be traced northward from the North lens for more than 3,500 feet and is believed to have resulted from strong shearing along an argillaceous horizon. The possible extension of this shear zone south of the deposits is obscured by overburden.

The North and South lenses are large bodies. At the surface the North lens is exposed for a length of 950 feet and has a maximum width of 120 feet. At the adit level its indicated length is 700 feet; its greatest width is in No. 6 crosscut, where 96 feet of massive sulphides is exposed. The underground workings establish 500 feet of backings; the widest part of the North lens.

At the surface the South lens is exposed for a length of 1,300 feet. For 900 feet of this length, the lens is 15 feet wide or more. At the adit level its average width is 24 feet for a length of 1,000 feet. The underground workings establish 240 feet of backings.

Drilling appears to indicate that the North lens diminishes sharply below the adit level but that the South lens continues downward for hundreds of feet. The deepest drill-hole testing the South lens intersected that body at a depth of 900 feet below sea-level.

Although a full explanation for the setting of these deposits must await further study and development, two facts are considered significant. First, the deposits are confined to a band of distinctive quartzose rocks and, second, they occur along a shear zone within these rocks. Dragfolding is locally important, having controlled the form of the northern part of the North lens, but whether it was a major factor in the localization of the deposits as a whole is not known.

A smaller untested deposit, known as the Third Outcrop, occurs on the east bank of Red Gulch Creek, 2,500 feet north of the northern end of the North lens. Here, at an elevation of 1,100 feet, massive pyrite is exposed for a length of 100 feet and a maximum width of 8 feet.

One of the main handicaps to the successful development of the property has been its location. The mine production cannot be shipped by way of the Ecstall River. It is understood that the company plans a survey to establish the best route for a road or railway from the property east to Douglas Channel. The two main deposits contain low values in silver and gold as well as economically interesting amounts of zinc and copper. The property was originally considered solely as a source of pyrite or sulphur.

The main deposits have been tested to depths far below the adit level by means of an ingenious method of drilling. Because the workings traverse little more than the stratigraphic horizon in which the deposits occur, and suitable underground locations were not available for the normal drilling of deep holes, directional drilling was employed. For example, the South lens was tested to depths as much as 975 feet below the adit level by holes collared at the ends of No. 1 and No. 2 crosscuts. These holes were started in the hangingwall of the South lens and were drilled downward in an easterly direction, away from the deposit. When desired depths were approached, the holes were progressively wedged until they were drilled westward at relatively low angles. In this way intersecting sections approximating true widths were obtained at specific depths. The Tro-Pa compass was used for determining bearings and dips in the drill-holes.

P R O P O S A L

HELICOPTER E.M. AND MAGNETOMETER

SURVEY

WELCOME NORTH MINES LTD.

ECSTALL RIVER MASSIVE SULFIDE PROJECT



AIRBORNE SURVEYS LTD.

512 - 625 Howe St., Vancouver, B.C.
Canada V6C 2T6

Phone (604) 683-3934
Telex 04-51309

February 12, 1981

Mr. John Brock
Welcome North Mines Ltd.
10th Floor, 470 Granville Street
Vancouver, B.C.

Dear John:

Please find enclosed my proposal for your Ecstall River Project.

I believe that the best way to pretest the area, rather than to bear the expense of mobilizing the H.E.M. equipment and crew, would be to run several ground e.m. traverses. I suggest using the multifrequency MAXMIN II system.

Subject to the variables inherent in our business, namely weather and equipment failure, we could start your project about April 1, 1981.

Regards,

Ron F. Shelldrake,
Apex Airborne Surveys Ltd.

PROPOSAL

APEX AIRBORNE SURVEYS LTD., hereinafter called APEX, is pleased to make a proposal for a rotary wing electromagnetic and magnetic survey in the ECSTALL RIVER Area, British Columbia on behalf of WELCOME NORTH MINES LTD., hereinafter called WELCOME NORTH. This proposal sets forth the specifications of the survey and the payments to be made to APEX in respect thereof.

I. SCOPE OF THE SURVEY

The purpose of the survey is to identify e.m. conductors that may be concentrations of massive sulphide mineralization. The survey will comprise of a minimum of 400 linear kilometers as specified on maps submitted to Apex by Welcome North.

II. SURVEY EQUIPMENT

APEX will supply the following equipment to perform the survey:

- Geonics EM-33 electromagnetic system which is composed of an electronic console, a power distribution panel, a six meter "bird" complete with two cables, and spare components for the above including a spare "bird". A frequency of 918 hertz will be used.
- A geometrics G-803 one gamma nuclear precession magnetometer.
- A U.D.A.S. digital acquisition system.
- A U.D.A.S. digital chart recorder.
- A Hoffman radar altimeter plus spares.
- A Geocam 35 mm tracking camera plus spares.
- A spherics monitor.

- A Gazelle helicopter to carry the above equipment.
- A Geometrics G826 magnetic base station.

III. SURVEY PERSONNEL

APEX will supply an operator, geophysicist and helicopter pilot who will perform the survey.

IV. DATA TO BE RECORDED

The following data will be recorded:

- Two channels of electromagnetic data being the in-phase and quadrature components of the secondary field.
- Two traces of magnetic information.
- One trace of helicopter terrain clearance.
- One trace displaying the spherics monitor.
- Fiducial marks appearing on the records every two seconds synchronized to numbered pictures taken by the flight path camera.

V. SURVEY SPECIFICATIONS

V.1 Line Spacing

The mean line spacing will be 200 meters.

V.2 Line Length

The minimum line length will be 4 kilometers.

V.3. Altitude

The altitude of the electromagnetic "bird" will normally be 35-45 meters above the ground surface and will not exceed 80 meters above the ground over a distance of two kilometers or a fill-in line will be flown at Apex's expense. The above statement will be adhered to except where the safety of the helicopter or "bird" will not allow it.

V.4 Preliminary Map

The geophysicist will assist the representative of Welcome North in preparing a conductor map in the field.

V.5 Base Map

A Photomosaic at a scale of 1:20,000 will be used as a base map.

VI. DATA PRESENTATION

VI.1 E.M. Profiles Map (Plate I)

The profiles of in-phase and quadrature responses will be plotted along the flight lines at a scale of 1 cm - 10 ppm and will be plotted on the base map described in Section V.5.

VI.2 Magnetic Contour Map (Plate II)

A contour map of the total magnetic field will be prepared on a clear mylar base map. The contour interval will be ten gammas wherever possible.

VI.3 Interpretation Map (Plate III)

An interpretation of the electromagnetic and magnetic data will be made on a clear mylar overlay. Formational responses, rock types and geological structures will be interpreted.

VII. SURVEY LOGISTICS AND TIMING

VII.1 The flying crew consisting of the operator geophysicist and pilot will be based in Prince Rupert, B.C. where accommodation will be found.

VII.2 At the time of preparation of this proposal APEX is prepared to conduct this survey upon the following schedule:

- Subject to prior commitments mobilization to Prince Rupert will begin on or before April 1, 1981.
- It is expected that the flying of the area, including fuel placement if necessary, can be completed in 4 - 6 day(s).
- Final maps, the interpretation report and all original data will be made available within 60 days or less after the survey is completed.

VIII. CHARGES

APEX charges for carrying out this survey will be as follows:

- a) APEX mobilization and demobilization at a fixed sum of - NIL
- b) To fly the detail survey as outlined, helicopter, helicopter fuel, all transportation, lodging and professional supervision, including a report suitable for assessment purposes \$67,725.
- c) Helicopter charges - NIL.

IX. INVOICING

Welcome North agrees to pay APEX as follows:

- | | |
|---|----------|
| a) on signing of this agreement | \$10,000 |
| b) on completion of first production flight | \$20,000 |
| c) on completion of survey | \$30,000 |
| d) on delivery of final map and report | balance |

After initial payment, account is due on receipt of the contractor's invoice.

X. GENERAL CONDITIONS

X.1 This Agreement shall cover all work that relates to this project as described in the sections above.

X.2 It is agreed and understood that APEX is, while acting under this Agreement, an independent contractor and is not acting as an agent or servant of WELCOME NORTH and that any persons engaged by APEX to conduct operations pursuant to this Agreement shall be employees of APEX and not of WELCOME NORTH.

X.3 APEX or its employees will not disclose any information gathered during the course of this survey to unauthorized third parties without prior authorization from WELCOME NORTH. All records and data shall be the sole property of WELCOME NORTH and shall be delivered to WELCOME NORTH upon the completion of any requested data compilation and interpretation.

X.4 It is hereby accepted by WELCOME NORTH that APEX will not be responsible for delays or non-performance in the execution of this survey and the delivery of the results thereof which are occasioned in whole or in part by force majeure including without limitation labour and civil disturbances, acts of God, aircraft or geophysical instrument failure, or any other causes which are beyond APEX's reasonable control.

X.5 APEX will perform and execute all work and services required pursuant to this survey in a proper, careful and workmanlike manner and in compliance with all appropriate Federal and/or Provincial regulations, acts or notices.

X.6 APEX shall be responsible for and will pay promptly all dues and assessments payable under the Worker's Compensation Act, in respect of its employees in the performance of this Agreement.

X.7 APEX shall respect the secrecy of all matters and materials

pertaining to this survey and will reveal to outside sources only as much information as is necessary to conduct the survey.

X.8 The survey described herein shall be flown according to the described specifications and WELCOME NORTH will not have the right to termination of this contract if the conditions of this Agreement are met.

If this proposal is accepted please sign below and return one copy and the deposit cheque to APEX.

APEX AIRBORNE SURVEYS LTD.

Ronald F. Sheldrake
President

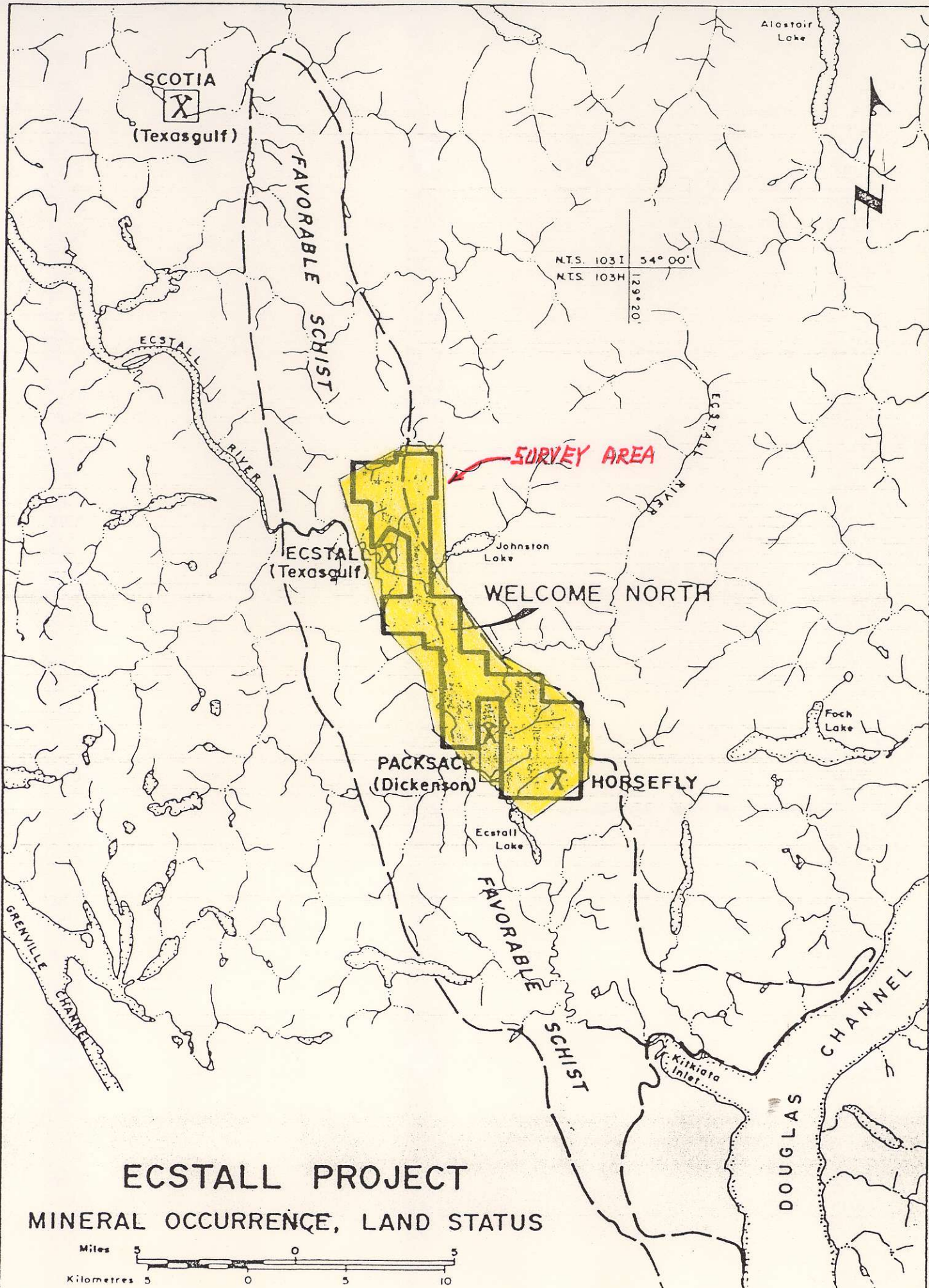
Dated this _____ day of _____, 1980.

ACCEPTED FOR APEX AIRBORNE SURVEYS LTD.

BY: _____

ACCEPTED FOR WELCOME NORTH MINES LTD.

BY: _____



SCOTIA
(Texasgulf)

FAVORABLE
SCHIST

N.T.S. 103I 54° 00'
N.T.S. 103H 129° 20'

ECSTALL
RIVER

SURVEY AREA

ECSTALL
(Texasgulf)

Johnston
Lake

WELCOME NORTH

PACKSACK
(Dickenson)

HORSEFLY

Ecstall
Lake

Foch
Lake

GRENVILLE
CHANNEL

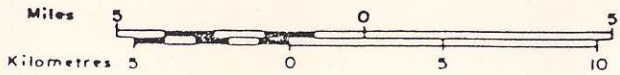
FAVORABLE
SCHIST

Kitkiata
Inlet

DOUGLAS
CHANNEL

ECSTALL PROJECT

MINERAL OCCURRENCE, LAND STATUS



HELICOPTER
HEIGHT

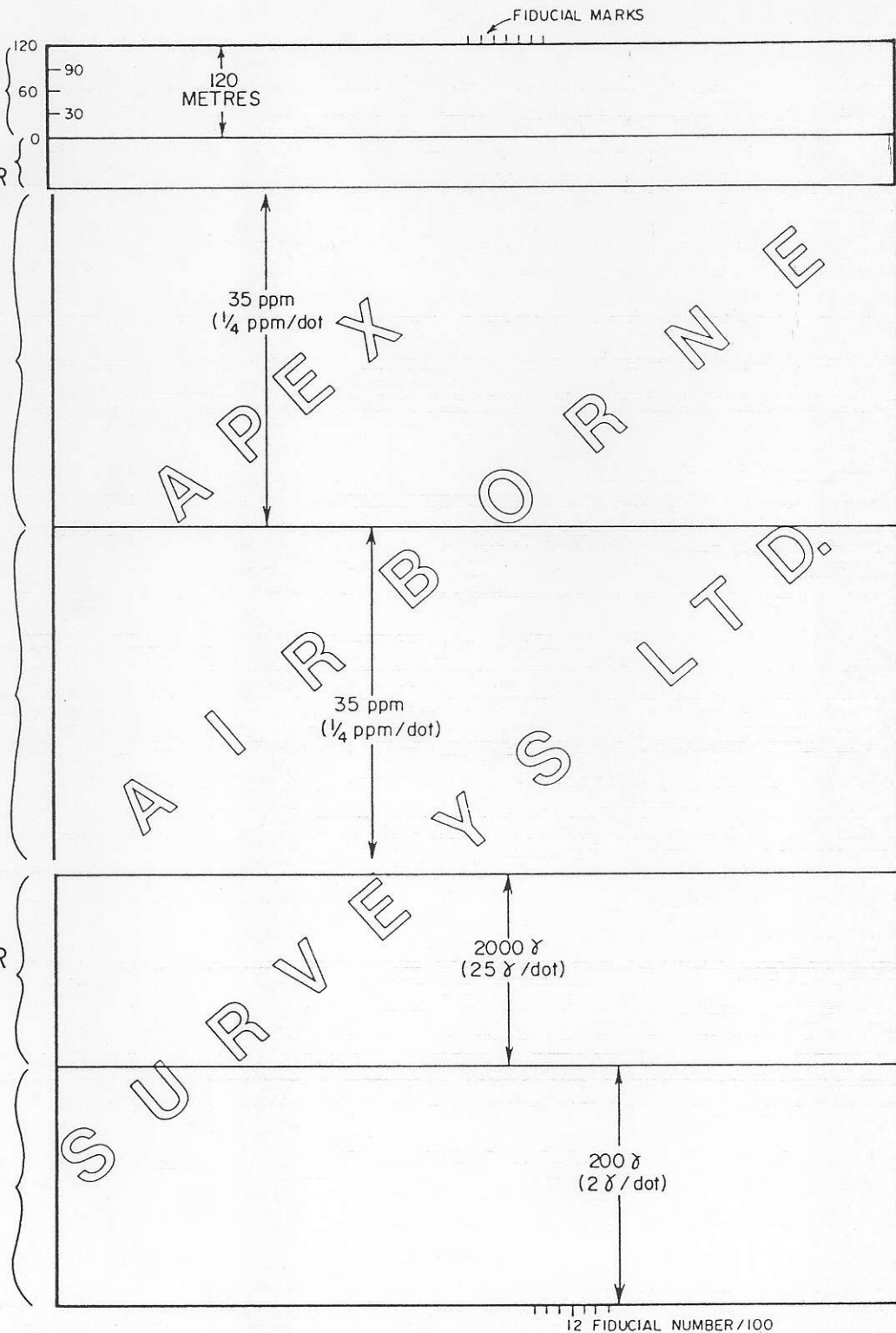
60 HRTZ AND
SPHERICS MONITOR

IN PHASE

QUADRATURE

MAGNETOMETER
COURSE

MAGNETOMETER
FINE



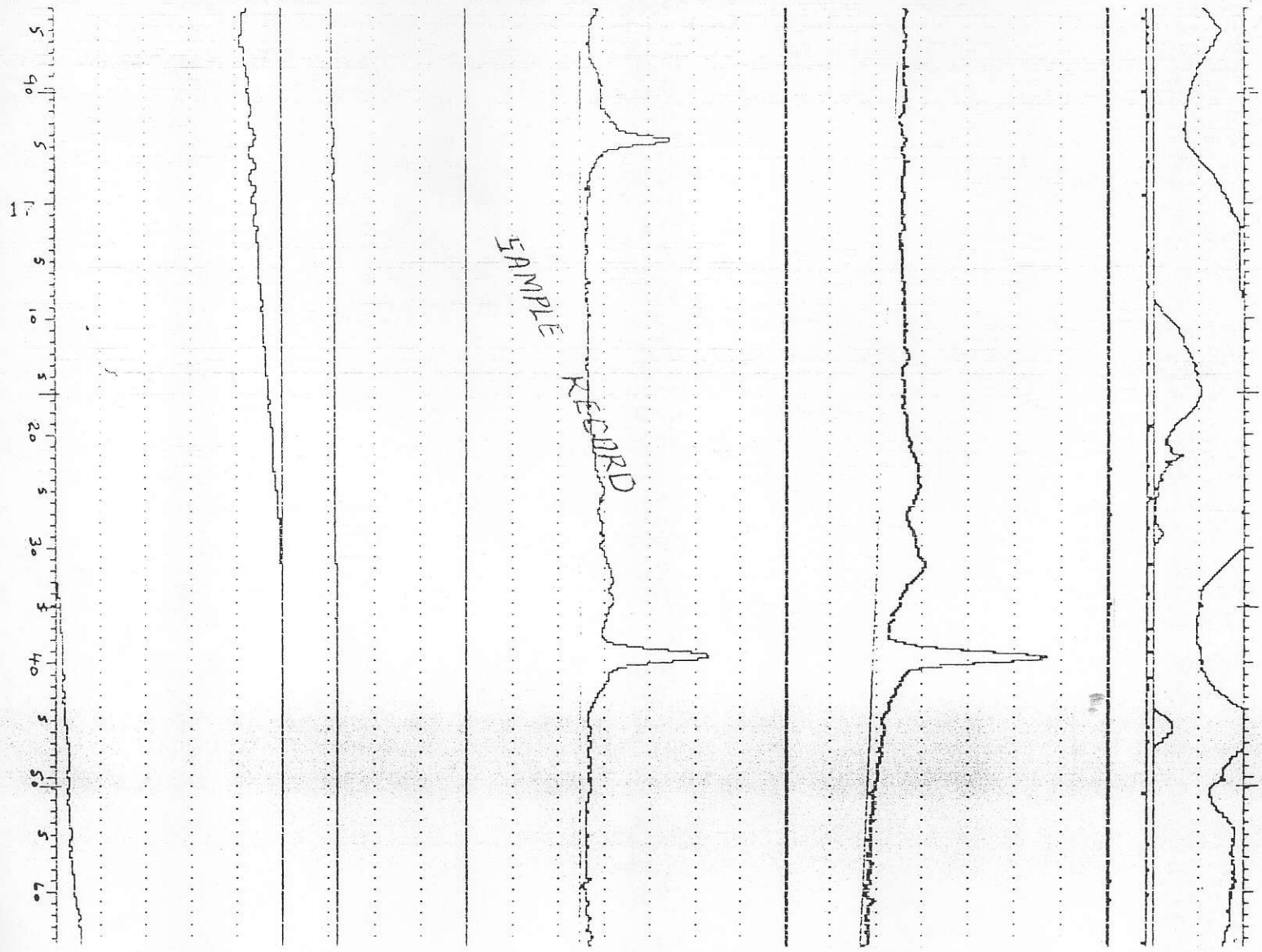
DTE 07 38 56#
 ACFT PN FLTN

	BASE	SCALE	SPAN	BIAS	GTYPE	F.SCALE (UNITS)
MAGC	100	25	80	0	0000	2000
MAGF	0	2	100	0	0000	200
ALTM	480	10	40	0	0000	400
INP1 -/+	320	8	70	70	0000	560
QAD1 -/+	180	8	70	70	0000	560
PWRL	460	8	10	0	0000	80
SPHR	461	8	10	10	0000	80

ADDRESS: 44A6
 PARAM: CAMT MMTG MAGT ANLT SPFT SPMT
 20 5 10 1 2 10
 ADDRESS: 44BA
 PARAM: DSPT PRIT NADC FSP GRI GRS RTC HERR
 10 4 5 0 5 20 3 3

0 100 200 300 400 500

LN 20 FH01683 TM 14 28 50 M 58571



EM33

Helicopter Electromagnetic Exploration System

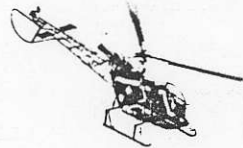
The Geonics EM33 represents a significant advance in the state-of-the-art in helicopter electromagnetic exploration systems.

Employment of recently developed composite material for the bird shell yields a degree of structural rigidity not previously attained. A new suspension system reduces bird bending noise and permits survey flying under conditions of atmospheric turbulence which would normally ground survey operations. Improved electronic signal processing substantially reduces interference from thunderstorm radiation ("spherics") and from radar, FM, television and standard broadcast transmitters.

A bird length of twenty (20) feet facilitates shipping the system from one survey location to another and reduces helicopter hook load to 325 lbs.

The system has large dynamic range and excellent drift characteristics, allowing one person to both navigate and operate. This feature, together with the light hook load, justifies small helicopters for many survey applications.

The EM33 employs the standard coaxial (maximum-coupled) coil configuration which survey experience has shown to be optimum for the detection of ore bodies with simultaneous rejection of overburden noise. The transmitter frequency (normally 736 Hz) can be varied from 400 to 4000 Hz to suit the customers' particular survey requirements.



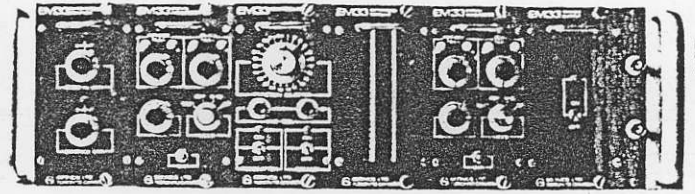
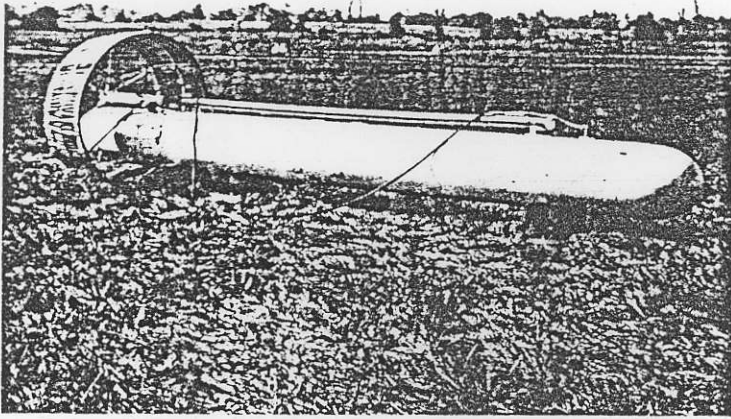
Specifications

Frequency	736 Hz nominal (a different frequency within the range 400-4000 Hz may be selected at additional cost)	Output Rise Time	Second order low pass filter for each of inphase and quadrature phase channels, simultaneously available at two rise times, typically 1 sec. and 4 sec. (different chart sensitivities may be selected)
Coil Separation	6.0 meters	Noise	Less than 1 ppm — still air conditions 2 ppm or less — winds of 20 mph
Coil Configuration	Coaxial max-coupled or coplanar max-coupled	Drift	Buck-out coil compensated Manual electrical correction from console
Measured Quantities	Inphase and quadrature phase components of received field in ppm.	Temperature Range	-40°C to +60°C
Console Outputs	Inphase — short time constant Inphase — long time constant Quadphase — short time constant Quadphase — long time constant 50/60 Hz power line monitor (also available as a fiducial) Spherics monitor (also available as a fiducial)	Power Requirements	Console: 35 watts (24-28 VDC) Bird: 175 watts (24-28 VDC)
Output Levels	± 1.0 volt nominal FSD (with x 10 over-range from low impedance source)	Calibration	Internal "Q-coil" switch selectable for Q = 1, Q = 2



GEONICS LIMITED

Designers & manufacturers
of geophysical instruments



System Operation

Operation of the EM33 is simple; the controls on the signal processing module are gain adjust, phase adjust, and electronic fine nulling. Illuminated null indicators facilitate rapid nulling by indicating the direction in which the null controls must be moved; the phase shifter operates over the range from 0 to greater than 180 degrees. The controller module, in addition to supplying calibration signals, allows voltages to be checked and selected circuit points to be monitored.

Additional Data Channels

In addition to the normal inphase and quadrature (out-of-phase) signal outputs, the EM33 contains a "spherics" monitor channel which indicates the presence and strength of spherics at a locked frequency offset, usually 20 Hz, from the transmitter frequency. Examination of this chart trace, which does not respond to subsurface conductors, enables the data reduction crew to immediately remove spherics and other external interference from the actual data traces. The spherics monitor output can also be fed to a fiducial marker pen to reduce the number of chart traces required.

Furthermore the system is equipped with a narrow band 50/60 Hz power line monitor to prevent identification of power lines as target conductors. This channel can also be fed to a chart trace or a fiducial pen.

Output Integrators

The analogue output integrators are computer designed to give optimal response from a vertical dyke conductor and have second order response. Provision is made for displaying the data simultaneously with two rise times, usually 1 and 4 seconds. The longer rise time reduces noise on the chart traces and permits detection of ore bodies at greater depths.

Calibration

System calibration and phasing are accomplished during the survey flight with the "Q-coil" technique which rapidly checks out the entire system against a virtual orebody internal to the bird.

General

The signal processor, monitor, controller, and power supply modules occupy two thirds the width of a standard 19" (5" high) rack module leaving ample room for the addition of an intervalometer. Their combined weight is 20 lbs.

The EM33 provides improved survey data, greater penetration depth, reduced survey costs as a result of modern design techniques resulting in lighter weight and the ability to survey close to urban and built-up areas.

Operation of the EM33 is compatible with a proton precession magnetometer, gamma ray spectrometer, and airborne VLF such as the Geonics EM18, thereby enhancing the cost/effectiveness of survey aircraft. Installation of the EM33 normally takes one day and removal of the system can be achieved in hours, freeing the helicopter for other operations when it is not required for survey.



February, 1980

ELECTROMAGNETIC - MAGNETIC HELICOPTER SYSTEM

Apex Airborne Surveys Ltd., is committed to utility of high performance geophysical and aircraft equipment. The electromagnetometer system is designed for the most rugged survey conditions, while achieving reliable data for:-

- 1) Identifying "target" conductors
- 2) Conductivity mapping.

DESCRIPTION OF SYSTEM

PLATFORMS: Lama, Gazelle, Bell 206B

ELECTROMAGNETOMETER: GEONICS 33-1

Frequency	:	918 hertz
Coil Separation	:	6 meters
Calibration	:	External and Internal Q coil
Noise	:	Less than 1/2 ppm at 0.6 sec. time constant
Acquisition	:	Digital IBM 9 Track Magnetic Tape
Display	:	8.85 inch digital printer.

ANCILLIARY EQUIPMENT:

Magnetometer	:	Geometrics G803 Proton Precession
Camera	:	Geocam 35 mm
Radar Altimeter	:	Hoffman HRA-100

STANDARD DATA PRESENTATION:

- Contour Map
- Profile Map
- Interpretation Map

Phone: R. SHELDRAKE
(604) 683-3934

ECSTALL PROJECT

PRINCIPAL TERMS OF AGREEMENT

1. Reimbursement of 1980 expenditures to Welcome North \$20,000
2. Participant commits to 1981 exploration expenditures - budget 200,000

3. Agreement Area

All mineral claims acquired by staking within an Agreement Area will be subject to the terms of this agreement. The perimeter of the Agreement Area is negotiable.

4. Specific Properties

All mineral claims acquired by staking shall, on or before December 31, 1982 be designated as Specific Properties and shall each be comprised of up to 100 claims units.

- a) Cash option payments shall be made by the Participant on each Specific Property held by the Project,

commencing Dec.31, 1982	\$20,000
1983	\$30,000
1984	\$40,000
1985	\$50,000

and annually thereafter until commencement of production - \$50,000

- b) A 3% N.S.R. Royalty shall be placed on each Specific Property.
- c) Welcome North shall have the option to 'back-in' to a 40 percent working interest on any Specific Property after the Participant has expended a total of \$3 million dollars within the Agreement Area.

5. Third Party Acquisitions

Mineral properties acquired from Third Parties shall not be subject to the provisions of paragraph 4 above other than Welcome North shall have the option to 'back-in' to a 20% working interest on any such property acquired upon the completion of an expenditure of \$1 million dollars on that property by the participants.

6. OPERATOR

Welcome North shall be Operator until December 31, 1982, after which time the Participant may elect to be Operator.

ECSTALL PROJECT

PRINCIPAL TERMS OF AGREEMENT

- | | |
|--|----------|
| 1. Reimbursement of 1980 expenditures to Welcome North | \$20,000 |
| 2. Participant commits to 1981 exploration expenditures - budget | 170,000 |

3. Agreement Area

All mineral claims acquired by staking within an Agreement Area will be subject to the terms of this agreement. The perimeter of the Agreement Area is negotiable.

4. Specific Properties

All mineral claims acquired by staking shall, on or before December 31, 1981 be designated as Specific Properties, each to be comprised of up to 100 claim units. 1981 exploration expenditures shall be prorated to each Specific Property.

- a) Cash option payments shall be made by the Participant on each Specific Property held by the Project,

commencing Dec. 31, 1982	\$20,000
1983	\$30,000
1984	\$40,000
1985	\$50,000

and annually thereafter until commencement of production \$50,000

- b) A 20% net profits interest shall be due to Welcome North from each Specific Property.
- c) The Participant shall earn its interest (subject to paragraph 4d) in a Specific Property in accordance with the following schedule of expenditures.

first	\$250,000	15%	
next	250,000	30%	for total \$500,000
next	250,000	45%	for total \$750,000
next	250,000	60%	for total \$1,000,000
next	1,000,000	70%	for total \$2,000,000
next	1,000,000	80%	for total \$3,000,000

d) Welcome North shall have the option to "back-in" to a working interest position on any Specific Property after the Participant has reached the following expenditure levels on any Specific Property.

at \$1,000,000 for a 40 percent working interest.
or at \$2,000,000 for a 30 percent working interest.
or at \$3,000,000 for a 20 percent working interest.

5. Third Party Acquisitions

Mineral properties acquired from Third Parties shall not be subject to the provisions of paragraph 4 above other than Welcome North shall have the option to "back-in" to a 20% working interest on any such property acquired upon the completion of an expenditure of \$1 million dollars on that property by the participants.

6. Operator

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