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MASS AND ANNEX OPTIONS

Cariboo Lake, British Columbia

NTS: 93A/11W,14W

GEOLOGY, GEOCHEMISTRY AND GEOPHYSICS 1991

GEOLOGICAL BRANCH
ASSESSMENT REPORT

21,930

Claims: Lad 1 TO 15; Mass 1 TO 5; Sel 1 TO 4
Cariboo Mining Division
52° 46'N, 121° 22'W

Owners: Formosa Resources Corporation
Annex Exploration Corp

Operator: Rio Algom Exploration Inc

J A McClintock

November 1991

SUMMARY

During the fall of 1991, at a cost of $49,857.00, a programme of prospecting, regional mapping, reconnaissance silt and soil sampling and 388km of helicopter EM and magnetometer surveying was carried out over the Mass and Annex options. The objective of this programme was to locate the source of zinc, lead and silver bearing massive sulphide boulders found at the mouth of Frank Creek.

The airborne EM survey identified conductors in seven separate localities on the Mass option, all of which lie within 3km of the boulder occurrence. Any of these conductors could be the source of the sulphide boulders. Reconnaissance silt sampling discovered two creeks with anomalous levels of zinc, lead and silver on the Mass 1 claim which warrant follow up prospecting and sampling.

The highly encouraging results of the 1991 work fully justify ongoing exploration of the Mass option. To this end, a comprehensive programme of ground EM, detailed prospecting and mapping, trenching and drilling is recommended to test the airborne conductors and silt anomalies. Cost of the proposed work is estimated to be $120,000.

As no conductors were found on the Annex option and geological and geochemical results were negative, no further work is recommended on these claims and the option should be terminated.

TABLE OF CONTENTS

MAPS

1 INTRODUCTION

This report describes the results of reconnaissance silt and soil sampling, geological mapping and airborne EM and magnetic surveying carried out on the Mass and Annex Options in 1991 by Rio Algom Exploration Inc. Rio Algom optioned the Mass and Annex properties from Formosa Resources Corporation and Annex Exploration Corp in the belief that the source of zinc, lead, silver and copper-bearing massive sulphide boulders, found at the mount of Frank Creek, was from somewhere on these claims.

The purpose of the 1991 work was to identify possible source areas of the massive sulphide boulders. This report discusses the results of the geochemical, geological and geophysical surveys and makes recommendations.

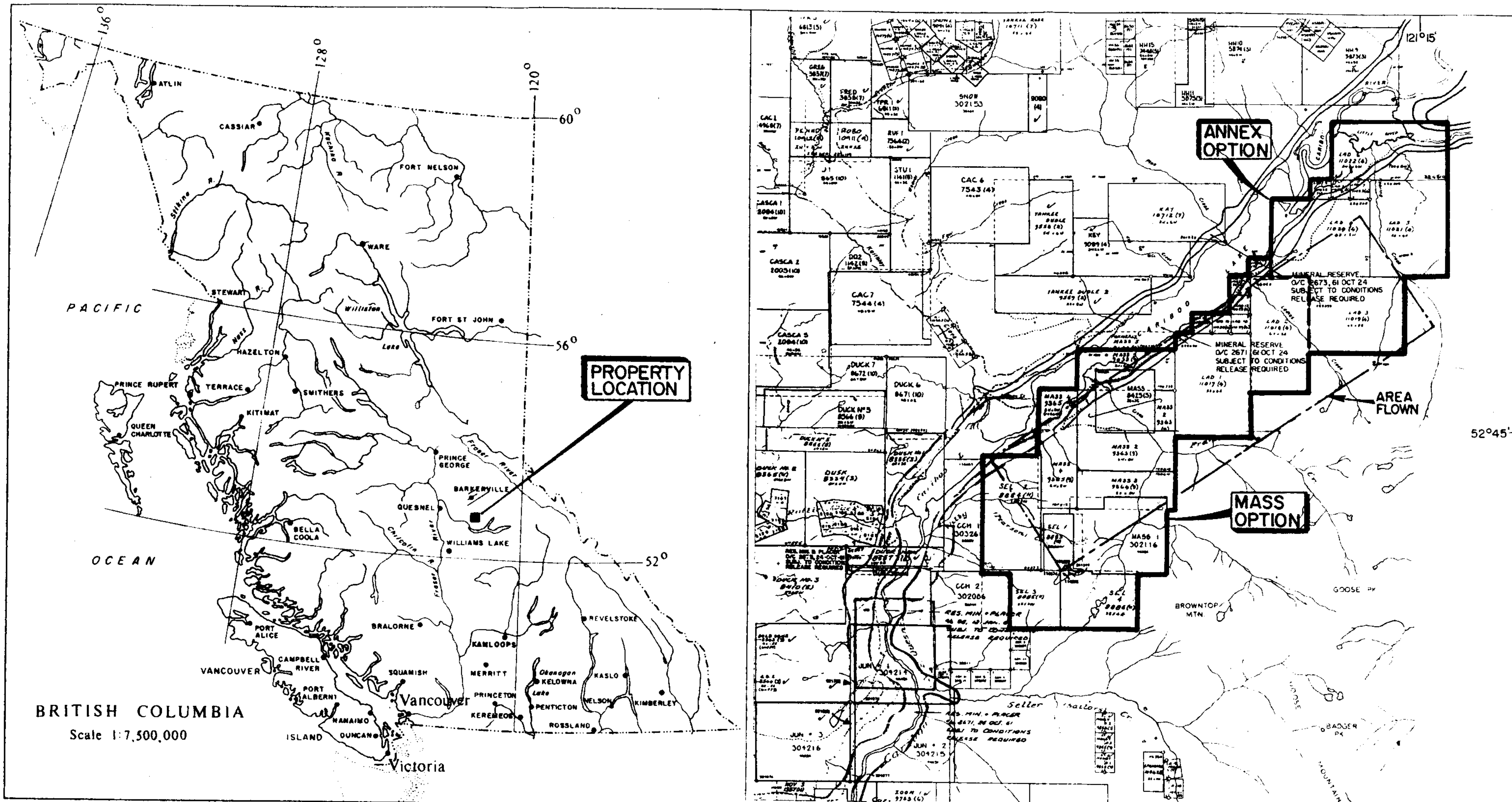
1.1 Location, Access and Physiography

The claims are situated approximately 15km northeast of the village of Likely, B C on the south shore of Cariboo Lake (Map 1). The claims are accessible by all weather logging roads from Likely. The 8400 Road, which begins just south of the Cariboo River, near the Weldwood logging camp, leads to spurs 8400C and 8400D which give direct access to the property.

Elevations on the property range from 812m at Cariboo Lake to 1500 metres. The property is covered by a mixture of overgrown logging slash, fresh clearcuts and subeconomic timber. A tree farm licence covering the claims is held by Weldwood of Canada.

1.2 Property

The Mass and Annex options are comprised of the following claims:



N.T.S. 93A-11,14 -CARIBOO M.D.,B.C.

Scale 1:100,000

2 1 0 2 4 6 8 KM.

Rio Algom Exploration Inc.

MASS & ANNEX OPTIONS

LOCATION MAP

DATE	DRAWN BY	DWG.
NOV. 1991	JAM/ Chong	1

Mass Option

Claim	Units	Record No:*	Record Date
Mass 1	20	302116	May 17 1991
Mass 2	20	205839	Sept 26 1988
Mass 3	10	205840	Sept 27 1988
Mass 4	12	205841	Sept 28 1988
Mass 5	10	208563	Sept 29 1988
Sel 1	6	205618	Nov 18 1987
Sel 2	18	205619	Nov 18 1987
Sel 3	12	205620	Nov 18 1987
Sel 4	12	205621	Nov 18 1987
Lad 1	20	207367	April 13 1991
Lad 2	18	207368	April 13 1991
Lad 10	1	207376	April 11 1991
Lad 11	1	207377	April 11 1991
Lad 12	1	207378	April 11 1991
Lad 13	1	207379	April 11 1991
Lad 14	1	207380	April 11 1991
Lad 15	1	207381	April 10 1991

Annex Option

Lad 3	20	207369	April 13 1991
Lad 4	20	207370	April 12 1991
Lad 5	20	207371	April 12 1991
Lad 6	18	207372	April 12 1991
Lad 7	1	207373	April 12 1991
Lad 8	1	207374	April 12 1991
Lad 9	1	207375	April 12 1991

* New Record Numbers

1.3 History

Frank Creek, also known as Goose Creek, has seen sporadic placer mining activity since the turn of the century. The most recent work on the creek was undertaken from 1984 to 1986 by the Rasmussen brothers. Massive sulphide boulders were uncovered in the course of sinking a 48ft (14.6m) shaft on the east side of the creek. A hard rock claim named the Home Run (nine units) was staked but little work was done and the property lapsed in 1987. This area was restaked as the Mass claims by Golden Eye Minerals in May 1987 and incorporated into the Mass group in February 1989.

In 1988, Formosa Resources Corporation optioned the Mass and carried out grid soil sampling, VLF-EM surveys and geological mapping over portions of the Mass 2, Mass 3, Mass 5 and Sel 1 claims. This work delineated a number of exploration targets consisting of coincident electromagnetic and coincident zinc-in-soil anomalies which Formosa geologists believe might be caused by a massive sulphide mineralization.

Believing the sulphide boulders might have been derived from a more distant locality, Rio Algom decided to reevaluate the entire area surrounding Frank Creek. To this end, reconnaissance mapping, prospecting, silt sampling and an airborne EM survey were carried out over the entire potential boulder source area.

1.4 Rio Algom Work Programme - 1991

In the fall of 1991, Guinet Management was contracted to undertake a programme of 1:10,000 scale geological mapping, prospecting, soil and silt sampling on the Mass 1 and Lad 1 to 15 mineral claims. In conjunction with the ground work, Aerodat Limited was commissioned to fly a 388km helicopter-borne EM and magnetic survey over the claim block.

2 GEOLOGY

Regional mapping by Struik (1982) designated the claim area as mainly undivided Snowshoe Group of the Barkerville terrain. Rocks encountered during this programme appear to best correspond to the Palaeozoic Downey, Goose Peak and Harveys Ridge successions of the upper Snowshoe Group.

Quartzite, grid and finer grained sediments and their schistose equivalents dominate the southwest part of the map from near Frank Creek to Ladies Creek. Deformation is greatest in this area as evidenced by at least three fracture or fault bounded minor intrusions and by small scale open wavy folding, drag folding and by variations in bedding attitudes. Most fold axis are flat to gently northward plunging. A diorite and a mafic dyke occur as small, two metre wide recent intrusions. A mass of ultramafic peridotite intrusions may be part of a larger structure. Generally, the rocks west of the peridotite dip southwesterly whereas rocks east of the peridotite are wavy folded followed by northeasterly dips.

Rocks east of Ladies Creek generally strike 120° to 140° and dip about 35° north-easterly. Occasional faults, such as the one in Roaring Creek near the main road, cause local stratigraphic distortions.

Volcanic rocks occur in the small knoll west of Roaring Creek. The volcanic rocks are difficult to distinguish from the fine grained schistose sediments but it appears the volcanic rocks are increasingly intercalated through a transition zone to mainly volcanic rocks to the northeast. Volcanic rocks consist mainly of andesitic tuff and tuffaceous phyllite, less volcanic schist and minor meta andesite or meta basalt. The weathered rocks occasionally have a light and dark green, thinly banded appearance.

All rocks on the property are variably slaty, foliated, laminated or schistose. The finer gained material is everywhere crenulated and in the deformed areas, the small scale folds are often fractured and offset near the hinge. The regional metamorphic grade is at least the biotite zone of the green schist facies. Stratigraphic tops are not known.

A black argillaceous schists is not widespread but can occur anywhere in association with the rocks mapped as grit. The unit is usually not more than two or three metres wide and it can be non-graphitic to variably weak to moderately graphitic along strike. Local, strongly graphitic areas can occur.

A chocolate brown weathering marble is rarely exposed but occurs in the northeast part of the map area near the boundary of the intercalated zone and the mainly volcanic package.

Quartz augens, lenses and bedding parallel and cross-cutting bull quartz veins occur everywhere but are more prominent in deformed areas, particularly occupying fold hinges. Increased quartz occurrences were as noted in sediments near the boundary with volcanic rocks.

Weakly disseminated secondary pyrite occurs locally in some quartzite and schist units. The schist can be locally gossanous with pyrite content up to 1 or 2%. A small gossan exposed near the eastern claim boundary contains 3-5% pyrite in a hydrothermally altered, bleached and clay altered zone, the original rock was probably an andesitic tuff (sample AG-YR-3).

The recent minor intrusions are not mineralized but the peridotite locally contains disseminated and/or lenses of pyrite to 1-3%. The peridotite also contains generally weakly disseminated magnetite to 1% (sample AG-YR-5).

Some of the volcanic schist can locally contain 2-3% pyrite, but generally the tuffaceous rocks do not appear to be mineralized. Some rusty float within the volcanic rocks contains 2-5% fine grained pyrite in weakly stratified siliceous layers (samples AG-YR-1 and AG-YR-4).

3 GEOCHEMISTRY

In conjunction with geological mapping and prospecting, 56 silt samples, 21 soil samples and five rock samples were collected (Maps 2 and 3). Silt samples were collected from all flowing streams encountered during prospecting and geological mapping, while soil samples were collected from a single line located northeast of Frank Creek. Rock sampling was restricted to float and outcrops of rock containing pyrite.

3.1 Sampling Method, Preparation and Analyses

Silt samples were collected from the finest material available from the active channel of the stream while soil samples were collected from the "B" soil horizon. Soil and silt were placed in gusseted Kraft paper envelopes marked with a sample number, then shipped to Chemex Labs Ltd in North Vancouver where both soil and silt were sieved to -80 mesh. A 0.5 gram subsample of the -80 mesh material was analyzed for molybdenum, copper, lead, zinc, silver, nickel, cobalt, manganese, iron, arsenic, uranium, thorium, strontium, cadmium, antimony, bismuth, vanadium, calcium, phosphorus, lanthium, chromium, magnesium, barium, titanium, alumina, sodium, potassium and tungsten by inductively coupled argon plasma method (ICP). Iron, calcium, phosphorus, magnesium, titanium, aluminum, sodium and potassium are reported in per cent while other elements are reported in parts per million (ppm). Gold was analyzed by atomic absorption (AA) after acid digestion of a 10 gram subsample of the -80 mesh fraction. Gold results are reported in parts per billion (ppb) and have a detection limit of 1 ppb. Sample certificates listing the analytical results for each element are appended to this report.

3.2 Results

There were too few samples collected to carry out any meaningful statistical analyses of the silt sample results. Anomalous levels for the elements of interest were arbitrarily selected based both on results from early surveys carried out by Formosa and on Rio's experience on other properties in the vicinity of the claims. The values of silver, lead, zinc, copper and arsenic, deemed anomalous, are listed in the following table:

Element	**Anomalous Level**
Silver	1.0 ppm
Lead	30 ppm
Zinc	150 ppm
Copper	50 ppm
Arsenic	20 ppm
Gold	20 ppb

With the exception of samples AG-SI-102, which contained 66ppm copper, and AG-SI-106, which contained 1.2ppm silver, all of the anomalous samples occur on the Mass 1 claim. Samples AG-SI-101 are AG-SI-103, which are anomalous for zinc, are not considered significant because of the very high manganese content of these samples. Scavenging of zinc by manganese oxide is believed to be the cause of the high zinc in these two samples.

Two multi-element anomalies occur on the Mass 1 claim. These are samples AG-SI-45, contained 2.4ppm Ag, 1.5ppm Cd, 48ppm Cu, 38ppm Pb and 168ppm Zn, and AG-SI-44, contained 2.0ppm Cd, 30ppm Pb, and 226ppm Zn. Both samples were collected from adjacent streams draining phyllites and metavolcanic rocks of the Harvey's Ridge Group and might be caused by zinc, lead and silver bearing massive sulphide mineralization.

4 GEOPHYSICS

Approximately 388 line kilometres of helicopter-borne EM, magnetics and radiometrics were flown over the Mass and Annex options. Full details of the survey, complete with descriptions of the results and identification of conductors, is provided in Appendix IV. For this reason, only a brief summary of the results is provided below.

The survey identified seven areas of the region which, based on the presence of electromagnetic conductors, warrant ground follow-up. With a single exception, these seven areas, identified on Map 6, lie southwest of Frank Creek in areas underlain by rocks of the Harvey's Ridge Group.

5 CONCLUSIONS

The helicopter-borne EM survey highlighted seven areas as having conductors which warrant further investigation. All of the conductors occur in the southwestern part of the survey and any of the conductors could be caused by sulphides. No conductors were found on the Annex option. With the exception of the conductors in Area H, conductors occur in rocks mapped by Struik (1982) as Harvey's Ridge Group.

Only the conductors in Area E lie within areas soil sampled by Formosa. The conductors in Area E occur up slope from an unexplained zinc-in-soil anomaly and are considered a priority for follow-up.

Prospecting on the Lad claims found no evidence of zinc, lead or copper sulphide mineralization either in place or as float. Analyses of silt and soil samples showed low values and did not identify any region which warranted follow-up. Silt sampling on the Mass 1 claim found anomalous zinc, lead and silver in two streams draining metavolcanic and phyllitic rocks of the Harvey's Ridge Group. These streams, which drain adjoining catchment basins, lie south of the airborne survey and have not previously been tested by grid soil sampling on ground EM surveys. It is possible that the source of the anomalous metals in both streams is massive sulphide mineralization.

6 RECOMMENDATIONS

The priority for future exploration of the Mass option is evaluation of the seven areas of conductors. Each of these conductors should be located on the ground by VLF-EM they evaluated by systematic prospecting and, if overburden is not transported or excessively thick, soil sampled. As many of the airborne conductors are oriented obliquely to the direction of the flight lines, it is important that the VLF-EM lines be oriented perpendicular to axis of the conductors.

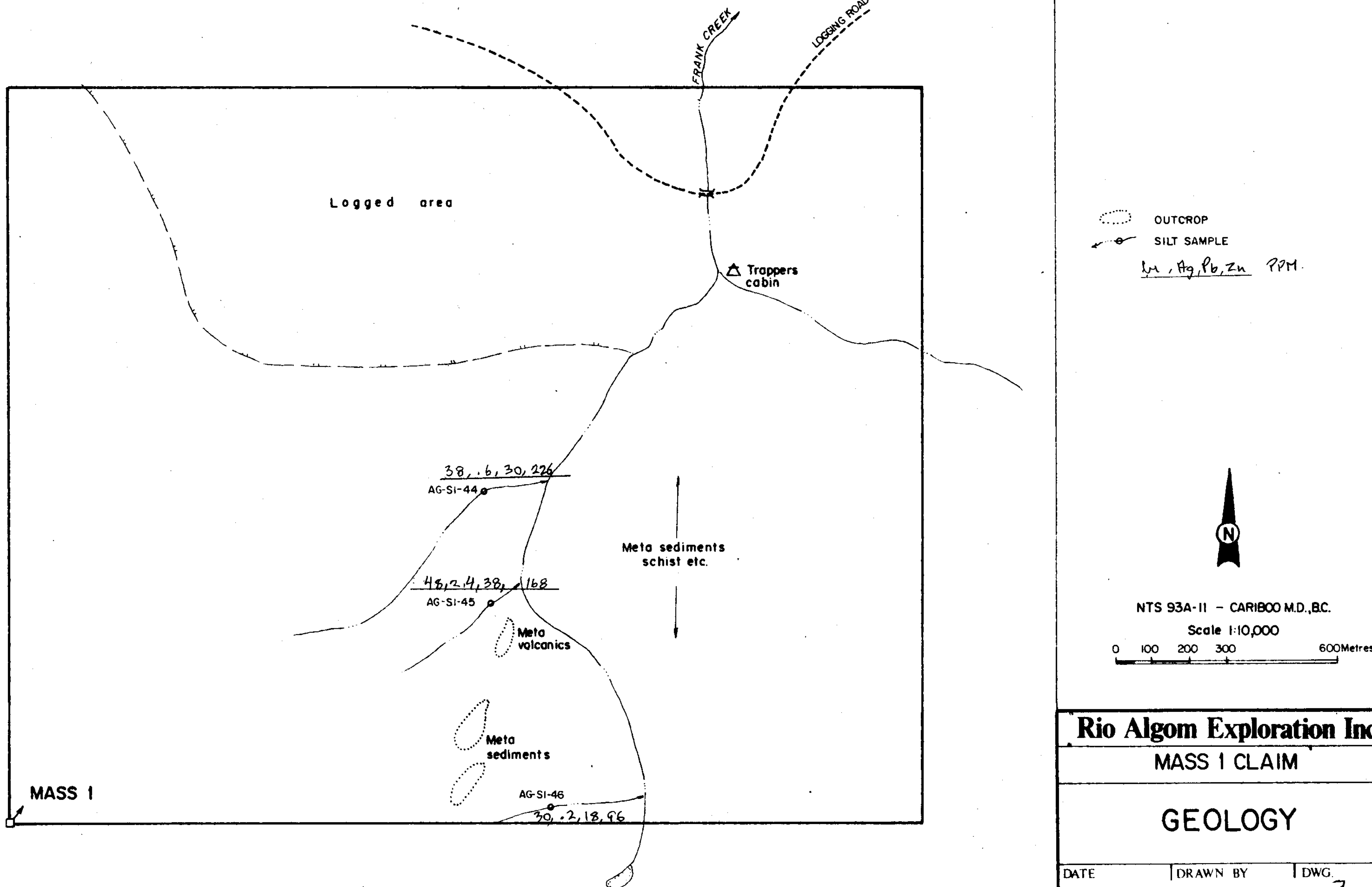
Once the conductors have been located on the ground, and if subsequent prospecting and detailed mapping substantiate them as possibly caused by massive sulphide source, a more detailed Max-Min Em survey is recommended to determine the orientation of the conductor prior to either drilling or trenching.

The cost of the recommended programme, inclusive of approximately 610m of NQ diamond drilling, is estimated to be $120,000.

As no conductors or geochemical or geological encouragement were found on the Annex option, it is recommended that the option be terminated.

7 REFERENCES

Martin, Lindsay S	Geological, Geochemical and Geophysical Report on the Mass Property, 1989. BCDM Assessment Report.
Struik, L C	Structural Geology of the Cariboo Gold Mining District, East-Central British Columbia. GSC Memoir 421, 1988.



Rio Algom Exploration Inc.

MASS 1 CLAIM

GEOLOGY

DATE	DRAWN BY	DWG.
NOV. 1991	JAM / Chong	3

8 STATEMENT OF QUALIFICATIONS

I, John A McClintock do certify that:

1 I am a geologist residing at 4044 Mars Place, Port Coquitlam, British Columbia.

2 I am a graduate of the University of British Columbia with the degree of B Sc (Honours) in Geology.

3 I am a registered member of the Association of Professional Engineers of the Province of British Columbia, registration 12078.

4 I have practised my profession as an exploration geologist continuously for more than 18 years.

5 I supervised the work programme on the Mass and Annex properties on behalf of Rio Algom Exploration Inc.

John A McClintock
November 1991

APPENDIX I

COST STATEMENT

APPENDIX I - COST STATEMENT

General Costs - Report Preparation:

i)	J A McClintock - 3 days @ $250/day	$750.00
ii)	Drafting	450.00
iii)	Prints, photocopying assembly	150.00
	Total General Costs	**$1,350.00**

Geological and Geochemical Costs:

i)	Mapping, sampling, prospecting - all inclusive cost - Guinet Management	$10,942.00
ii)	Site visit - J A McClintock - October 21	250.00
iii)	Airfare	350.00
iv)	Car rental - Tilden Rent a Car	92.00
v)	Analyses - Chemex Labs Ltd	873.00
vi)	Portion of General Costs	340.00
	Total Geological and Geochemical Costs	**$12,847.00**

Geophysical Costs:

i)	Airborne Survey - all inclusive - Aerodat Limited	$36,000.00
ii)	Portion of General Costs	1,010.00
	Total Geophysical Costs	**$37,010.00**
	TOTAL COSTS	**$49,857.00**

COSTS APPORTIONED TO GROUPINGS

Group	Geology and Geochemistry	Geophysics	Total
A	$6,423.50	$9,252.50	$15,676.00
B	$5,138.80	$13,878.75	$19,017.55
C	$1,284.70	$13,878.75	$15,163.45
Total			**$49,857.00**

APPENDIX II

ROCK SAMPLE DESCRIPTIONS

APPENDIX II - ROCK SAMPLE DESCRIPTIONS

Sample Number	Comments
AG-YR-01	From Lad 6 claim. Float sample. Light and dark green weakly schistose volcanic 2-3% fine grained pyrite in a weakly siliceous layer.
AG-YR-02	From Lad 5 claim. Float sample. Light grey to white siliceous rhyolite(?) or altered andesitic tuff. Trace disseminated pyrite.
AG-YR-03	From Lad 5 claim. Small gossan (10m x 10m). Hydrothermal alteration of andesitic tuff. Siliceous, bleached, clay altered rock with 3-5% secondary pyrite.
AG-YR-04	From Lad 6 claim. Float sample. Dark grey green andesite or basalt with biotite metacrysts. 3-5% very fine stratigraphic pyrite in a siliceous zone.
AG-YR-05	From Lad 1 claim. Sample of green peridotite. Trace disseminated pyrite and about 1% magnetite.
AG-PR-01	Rock grab sample from Roaring Creek. Quartz flooded metasediment with less than 1% pyrite. Rocks in immediate area are predominantly phyllites and schists.
AG-PR-02	Rock grab sample from near Clair Creek. Chloritic schists with around 2-3% pyrite on cleavage and planes. Sample from outcrop on roadside.

APPENDIX III

ANALYTICAL RESULTS

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers

212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

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P.O. BOX 10335, PACIFIC CENTRE
1650 - 609 GRANVILLE ST.
VANCOUVER, BC
V7Y 1G5

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Page Number : 1-A
Total Pages : 1
Certificate Date: 23-SEP-91
Invoice No. : I9121872
P.O. Number :

Project : 9124
Comments: CC: GUINET MANAGEMENT INC.

CERTIFICATE OF ANALYSIS A9121872

SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm
AG-PR-1	205	294	< 5	< 0.2	0.56	< 5	20	< 0.5	< 2	0.02	< 0.5	4	120	26	1.27	< 10	< 1	0.12	10	0.19	50
AG-PR-2	205	294	< 5	< 0.2	2.33	5	60	< 0.5	< 2	0.04	< 0.5	9	97	31	6.64	< 10	< 1	0.34	20	1.05	405
AG-YR-1	205	294	< 5	< 0.2	1.43	< 5	50	< 0.5	8	0.07	< 0.5	6	106	21	2.74	< 10	< 1	0.25	10	0.73	125
AG-YR-2	205	294	< 5	< 0.2	0.34	< 5	40	< 0.5	4	0.01	< 0.5	1	137	5	0.72	< 10	< 1	0.15	10	0.01	15
AG-YR-3	205	294	< 5	< 0.2	0.78	< 5	30	< 0.5	< 2	0.04	< 0.5	1	31	40	6.18	< 10	< 1	0.13	50	0.12	95
AG-YR-4	205	294	< 5	< 0.2	2.62	< 5	180	< 0.5	8	0.25	< 0.5	16	120	70	4.18	< 10	< 1	1.28	20	1.52	320
AG-YR-5	205	294	< 5	< 0.2	1.44	< 5	370	< 0.5	< 2	5.36	< 0.5	28	81	80	5.53	10	< 1	0.05	10	2.33	840

CERTIFICATION: B. Cargill

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers

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Project : 9124
Comments: CC: GUINET MANAGEMENT INC.

Certificate Date: 23-SEP-91
Invoice No. : I9121872
P.O. Number :

CERTIFICATE OF ANALYSIS A9121872

SAMPLE DESCRIPTION	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
AG-PR-1	205	294	1	0.01	7	60	< 2	< 5	< 1	3	< 0.01	< 10	< 10	3	< 10	24
AG-PR-2	205	294	9	0.02	17	400	10	< 5	3	8	0.05	< 10	< 10	30	< 10	90
AG-YR-1	205	294	1	0.02	10	320	10	< 5	1	5	0.01	< 10	< 10	12	< 10	60
AG-YR-2	205	294	< 1	0.03	3	40	4	< 5	< 1	6	< 0.01	< 10	< 10	3	< 10	6
AG-YR-3	205	294	< 1	0.06	3	1050	6	< 5	4	19	< 0.01	< 10	< 10	8	< 10	38
AG-YR-4	205	294	14	0.05	31	390	18	< 5	6	14	0.20	< 10	< 10	97	< 10	58
AG-YR-5	205	294	< 1	0.04	60	1490	2	< 5	10	67	0.06	< 10	< 10	95	< 10	72

CERTIFICATION: B. Cargh

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MASS ANNEX

Certificate Date: 25-SEP-91
Invoice No. :I9121871
P.O. Number :

Project : 9124
Comments: CC: GUINET MANAGEMENT INC.

CERTIFICATE OF ANALYSIS A9121871

SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm
AG-SI-001	201	298	< 5	< 0.2	0.77	10	20	< 0.5	< 2	0.16	< 0.5	13	14	39	4.17	< 10	< 1	0.02	< 10	0.26	210
AG-SI-002	201	298	< 5	< 0.2	0.56	5	20	< 0.5	< 2	0.09	< 0.5	12	9	37	2.48	< 10	< 1	0.02	< 10	0.20	610
AG-SI-003	201	298	40	< 0.2	0.65	5	20	< 0.5	< 2	0.08	< 0.5	11	11	19	2.67	< 10	< 1	0.03	< 10	0.23	715
AG-SI-004	201	298	< 5	< 0.2	0.83	< 5	30	< 0.5	< 2	0.27	0.5	11	14	30	2.79	< 10	< 1	0.06	20	0.32	760
AG-SI-005	201	298	< 5	< 0.2	0.88	< 5	30	< 0.5	< 2	0.30	0.5	11	15	27	2.84	< 10	2	0.06	20	0.35	725
AG-SI-006	201	298	< 5	< 0.2	0.67	5	20	< 0.5	< 2	0.24	< 0.5	11	14	24	2.42	< 10	< 1	0.07	20	0.30	760
AG-SI-007	201	298	< 5	< 0.2	0.87	25	90	< 0.5	< 2	0.54	< 0.5	20	14	33	4.11	< 10	< 1	0.05	10	0.35	5590
AG-SI-008	201	298	< 5	< 0.2	0.60	5	30	< 0.5	< 2	0.21	< 0.5	11	11	25	2.68	< 10	< 1	0.02	10	0.24	1575
AG-SI-009	201	298	< 5	< 0.2	0.57	5	20	< 0.5	< 2	0.18	< 0.5	7	10	22	2.08	< 10	< 1	0.02	10	0.23	675
AG-SI-010	201	298	< 5	< 0.2	0.86	5	50	< 0.5	< 2	0.40	0.5	11	16	30	4.38	< 10	< 1	0.05	10	0.33	1115
AG-SI-011	201	298	< 5	< 0.2	0.53	< 5	20	< 0.5	< 2	0.12	0.5	9	12	20	2.05	< 10	< 1	0.03	10	0.20	585
AG-SI-012	201	298	< 5	< 0.2	0.66	< 5	30	< 0.5	< 2	0.19	< 0.5	9	15	16	2.14	< 10	< 1	0.05	20	0.28	950
AG-SI-013	201	298	< 5	< 0.2	0.52	10	30	< 0.5	< 2	0.15	< 0.5	8	13	15	1.95	< 10	< 1	0.04	20	0.23	525
AG-SI-014	201	298	< 5	< 0.2	0.56	< 5	20	< 0.5	< 2	0.19	< 0.5	6	11	14	1.57	< 10	< 1	0.05	10	0.26	415
AG-SI-015	201	298	< 5	< 0.2	0.79	< 5	30	< 0.5	< 2	0.28	0.5	7	15	18	1.92	< 10	1	0.09	10	0.35	445
AG-SI-016	201	298	< 5	< 0.2	0.70	5	10	< 0.5	< 2	0.35	< 0.5	8	15	22	2.04	< 10	< 1	0.06	20	0.31	445
AG-SI-017	201	298	< 5	< 0.2	0.70	< 5	30	< 0.5	< 2	0.26	0.5	10	13	22	2.57	< 10	< 1	0.06	10	0.28	1175
AG-SI-018	201	298	< 5	0.2	0.77	< 5	20	< 0.5	< 2	0.29	< 0.5	7	14	16	1.61	< 10	< 1	0.05	20	0.31	210
AG-SI-019	201	298	< 5	< 0.2	0.76	< 5	30	< 0.5	< 2	0.25	0.5	8	17	23	2.17	< 10	< 1	0.07	30	0.32	590
AG-SI-020	201	298	< 5	< 0.2	0.80	10	30	< 0.5	< 2	0.23	< 0.5	10	18	23	2.32	< 10	< 1	0.07	30	0.35	600
AG-SI-021	201	298	< 5	< 0.2	0.72	< 5	30	< 0.5	< 2	0.21	< 0.5	8	14	19	2.00	< 10	< 1	0.06	20	0.33	450
AG-SI-022	201	298	< 5	< 0.2	0.74	< 5	30	< 0.5	< 2	0.18	0.5	9	15	20	2.03	< 10	< 1	0.07	20	0.32	440
AG-SI-023	201	298	< 5	1.0	0.91	< 5	30	< 0.5	< 2	0.42	< 0.5	9	21	32	2.03	< 10	< 1	0.09	100	0.35	515
AG-SI-024	201	298	< 5	< 0.2	0.71	< 5	20	< 0.5	< 2	0.14	0.5	6	12	11	1.69	< 10	< 1	0.06	20	0.26	600
AG-SI-025	201	298	< 5	< 0.2	0.57	< 5	30	< 0.5	< 2	0.26	< 0.5	7	12	11	1.67	< 10	< 1	0.06	10	0.28	890
AG-SI-026	201	298	< 5	< 0.2	0.98	< 5	80	< 0.5	< 2	0.40	< 0.5	12	16	16	2.62	< 10	< 1	0.08	20	0.35	2890
AG-SI-027	201	298	< 5	< 0.2	0.61	5	30	< 0.5	< 2	0.16	< 0.5	7	12	17	1.63	< 10	< 1	0.07	10	0.26	505
AG-SI-028	201	298	< 5	< 0.2	0.82	< 5	40	< 0.5	< 2	0.28	< 0.5	9	15	16	2.03	< 10	< 1	0.06	30	0.34	815
AG-SI-029	201	298	< 5	< 0.2	0.97	5	40	< 0.5	< 2	0.25	< 0.5	10	23	28	2.68	< 10	< 1	0.09	20	0.46	590
AG-SI-030	201	298	< 5	< 0.2	0.88	< 5	20	< 0.5	< 2	0.17	< 0.5	12	16	28	2.63	< 10	< 1	0.06	20	0.41	390
AG-SI-031	201	298	< 5	< 0.2	0.71	< 5	20	< 0.5	< 2	0.20	0.5	8	13	18	1.86	< 10	< 1	0.05	10	0.31	425
AG-SI-032	201	298	< 5	< 0.2	1.08	5	40	< 0.5	< 2	0.25	< 0.5	10	17	29	2.64	< 10	< 1	0.07	20	0.44	610
AG-SI-033	201	298	< 5	< 0.2	0.87	< 5	50	< 0.5	< 2	0.39	< 0.5	12	16	23	2.49	< 10	< 1	0.07	10	0.36	1795
AG-SI-034	201	298	< 5	< 0.2	0.92	< 5	30	< 0.5	< 2	0.54	0.5	9	18	25	2.39	< 10	< 1	0.06	10	0.40	1190
AG-SI-035	201	298	< 5	< 0.2	1.17	5	50	< 0.5	< 2	0.35	< 0.5	13	20	33	3.14	< 10	< 1	0.09	20	0.51	1295
AG-SI-036	201	298	< 5	< 0.2	0.86	< 5	20	< 0.5	< 2	0.12	< 0.5	9	18	21	2.43	< 10	< 1	0.05	30	0.40	400
AG-SI-037	201	298	< 5	1.0	1.32	5	70	< 0.5	< 2	1.37	0.5	10	50	50	3.03	10	< 1	0.06	120	0.34	2370
AG-SI-038	201	298	< 5	< 0.2	0.75	5	20	< 0.5	< 2	0.18	< 0.5	7	15	16	3.51	< 10	< 1	0.05	20	0.28	315
AG-SI-039	201	298	< 5	< 0.2	0.57	5	10	< 0.5	< 2	0.18	< 0.5	6	11	14	1.71	< 10	2	0.04	20	0.26	215
AG-SI-040	201	298	< 5	< 0.2	1.16	< 5	50	< 0.5	< 2	0.40	< 0.5	11	20	33	2.90	< 10	< 1	0.09	20	0.52	755

CERTIFICATION: B. Cargh

Chemex Labs Ltd.
Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: RIO ALGOM EXPLORATION INC.
P.O. BOX 10335, PACIFIC CENTRE
1650 - 609 GRANVILLE ST.
VANCOUVER, BC
V7Y 1G5

Project : 9124
Comments: CC: GUINET MANAGEMENT INC.

Certificate Date: 25-SEP-91
Invoice No. : I9121871
P.O. Number :

CERTIFICATE OF ANALYSIS A9121871

SAMPLE DESCRIPTION	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
AG-SI-001	201	298	1	< 0.01	61	570	24	5	1	15	< 0.01	< 10	< 10	8	< 10	124
AG-SI-002	201	298	< 1	< 0.01	25	300	28	< 5	< 1	9	< 0.01	< 10	< 10	2	< 10	70
AG-SI-003	201	298	< 1	< 0.01	18	260	14	< 5	< 1	8	< 0.01	< 10	< 10	6	< 10	52
AG-SI-004	201	298	1	< 0.01	27	470	8	< 5	1	16	< 0.01	< 10	< 10	7	< 10	68
AG-SI-005	201	298	1	< 0.01	22	560	12	< 5	1	17	< 0.01	< 10	< 10	7	< 10	72
AG-SI-006	201	298	1	< 0.01	21	500	12	5	1	15	0.01	< 10	< 10	8	< 10	54
AG-SI-007	201	298	2	< 0.01	32	580	24	< 5	1	39	< 0.01	< 10	< 10	9	< 10	136
AG-SI-008	201	298	< 1	< 0.01	35	350	12	< 5	< 1	20	< 0.01	< 10	< 10	6	< 10	94
AG-SI-009	201	298	< 1	< 0.01	22	370	18	< 5	< 1	12	< 0.01	< 10	< 10	6	< 10	62
AG-SI-010	201	298	1	< 0.01	22	550	16	5	1	29	< 0.01	< 10	< 10	8	< 10	74
AG-SI-011	201	298	< 1	< 0.01	18	310	18	< 5	< 1	9	< 0.01	< 10	< 10	6	< 10	54
AG-SI-012	201	298	< 1	< 0.01	17	380	10	< 5	< 1	14	0.01	< 10	< 10	9	< 10	54
AG-SI-013	201	298	< 1	< 0.01	17	380	4	< 5	< 1	11	0.01	< 10	< 10	6	< 10	44
AG-SI-014	201	298	< 1	< 0.01	14	450	10	< 5	< 1	11	0.01	< 10	< 10	7	< 10	46
AG-SI-015	201	298	< 1	< 0.01	20	510	12	< 5	1	17	0.01	< 10	< 10	11	< 10	80
AG-SI-016	201	298	< 1	< 0.01	19	550	8	< 5	< 1	19	0.01	< 10	< 10	9	< 10	56
AG-SI-017	201	298	1	< 0.01	22	390	18	< 5	1	18	< 0.01	< 10	< 10	7	< 10	78
AG-SI-018	201	298	< 1	< 0.01	14	500	6	< 5	< 1	16	0.01	< 10	< 10	10	< 10	50
AG-SI-019	201	298	1	< 0.01	22	540	12	< 5	< 1	18	0.01	< 10	< 10	7	< 10	74
AG-SI-020	201	298	1	< 0.01	22	500	12	< 5	1	16	0.01	< 10	< 10	8	< 10	72
AG-SI-021	201	298	< 1	< 0.01	18	460	12	< 5	1	14	0.01	< 10	< 10	9	< 10	64
AG-SI-022	201	298	< 1	< 0.01	20	420	6	5	1	13	0.01	< 10	< 10	9	< 10	58
AG-SI-023	201	298	< 1	< 0.01	29	490	12	< 5	1	22	0.01	< 10	10	16	< 10	58
AG-SI-024	201	298	< 1	< 0.01	13	330	10	< 5	1	9	0.01	< 10	< 10	12	< 10	40
AG-SI-025	201	298	< 1	< 0.01	11	370	10	< 5	< 1	12	0.01	< 10	< 10	9	< 10	40
AG-SI-026	201	298	< 1	< 0.01	22	530	10	< 5	1	30	0.01	< 10	< 10	13	< 10	74
AG-SI-027	201	298	< 1	< 0.01	13	390	6	< 5	1	11	0.01	< 10	< 10	9	< 10	40
AG-SI-028	201	298	< 1	< 0.01	19	370	8	< 5	1	21	0.02	< 10	< 10	12	< 10	56
AG-SI-029	201	298	< 1	< 0.01	26	570	14	5	1	18	0.03	< 10	< 10	17	< 10	68
AG-SI-030	201	298	1	< 0.01	27	370	16	5	1	11	0.01	< 10	< 10	8	< 10	72
AG-SI-031	201	298	< 1	< 0.01	15	570	4	< 5	1	13	0.01	< 10	< 10	13	< 10	46
AG-SI-032	201	298	< 1	< 0.01	21	580	16	< 5	2	21	0.01	< 10	< 10	23	< 10	66
AG-SI-033	201	298	< 1	< 0.01	20	620	< 2	< 5	1	31	0.01	< 10	< 10	19	< 10	72
AG-SI-034	201	298	1	< 0.01	20	610	6	< 5	1	42	0.01	< 10	< 10	19	< 10	72
AG-SI-035	201	298	1	< 0.01	24	620	14	< 5	2	27	0.02	< 10	< 10	27	< 10	72
AG-SI-036	201	298	< 1	< 0.01	24	370	12	< 5	1	10	0.02	< 10	< 10	9	< 10	78
AG-SI-037	201	298	4	< 0.01	34	1340	18	5	1	76	0.02	< 10	60	11	< 10	90
AG-SI-038	201	298	1	< 0.01	15	340	2	< 5	1	14	0.01	< 10	< 10	11	< 10	50
AG-SI-039	201	298	< 1	< 0.01	13	580	8	< 5	1	11	0.02	< 10	< 10	12	< 10	32
AG-SI-040	201	298	< 1	< 0.01	25	570	12	5	2	26	0.03	< 10	< 10	21	< 10	62

CERTIFICATION:

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers

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To: RIO ALGOM EXPLORATION INC.
P.O. BOX 10335, PACIFIC CENTRE
1650 - 609 GRANVILLE ST.
VANCOUVER, BC
V7Y 1G5

Project : 9124
Comments: CC: GUINET MANAGEMENT INC.

Certificate Date: 25-SEP-91
Invoice No. : I9121871
P.O. Number :

CERTIFICATE OF ANALYSIS A9121871

SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm
AG-SI-041	201	298	< 5	< 0.2	0.94	< 5	30	< 0.5	< 2	0.35	< 0.5	10	14	25	2.66	< 10	< 1	0.04	30	0.34	485
AG-SI-042	201	298	< 5	< 0.2	0.81	5	20	< 0.5	< 2	0.27	< 0.5	11	19	26	2.32	< 10	< 1	0.06	30	0.35	620
AG-SI-043	201	298	< 5	< 0.2	0.83	< 5	20	< 0.5	2	0.12	< 0.5	10	15	20	2.22	< 10	< 1	0.05	30	0.37	380
AG-SI-044	217	298	< 5	0.6	1.91	5	200	< 0.5	< 2	0.80	2.0	20	254	38	4.80	< 10	< 1	0.08	50	0.35	3550
AG-SI-045	203	205	< 5	2.4	1.73	20	240	< 0.5	< 2	1.07	1.5	13	191	48	3.19	< 10	< 1	0.08	60	0.33	2430
AG-SI-046	203	205	< 5	< 0.2	1.81	< 5	140	< 0.5	< 2	0.27	0.5	17	97	30	3.92	< 10	< 1	0.11	20	0.81	355
AG-SI-047	201	298	< 5	< 0.2	1.05	5	30	< 0.5	< 2	0.34	< 0.5	11	18	30	2.71	< 10	2	0.05	20	0.49	640
AG-SI-101	203	205	< 5	< 0.2	0.09	< 5	160	< 0.5	< 2	0.38	0.5	139	7	12	>15.00	< 10	< 1	0.01	< 10	0.07	>10000
AG-SI-102	217	298	< 5	0.4	0.99	5	40	< 0.5	< 2	1.20	< 0.5	7	74	66	1.87	10	1	0.13	270	0.56	990
AG-SI-103	217	298	< 5	< 0.2	1.35	5	320	< 0.5	< 2	0.91	0.5	32	49	28	8.48	< 10	< 1	0.15	90	0.27	>10000
AG-SI-104	203	205	< 5	< 0.2	0.97	< 5	150	< 0.5	< 2	0.61	< 0.5	11	176	17	3.12	< 10	< 1	0.11	30	0.34	4090
AG-SI-105	217	298	< 5	< 0.2	1.73	< 5	180	< 0.5	< 2	0.78	1.0	37	67	25	6.64	< 10	< 1	0.19	90	0.42	7180
AG-SI-106	217	298	< 5	1.2	1.08	< 5	60	< 0.5	< 2	1.21	0.5	8	85	40	2.37	10	3	0.13	140	0.40	700
AG-SI-107	201	298	< 5	< 0.2	1.03	10	50	< 0.5	< 2	0.25	< 0.5	8	17	15	2.97	< 10	< 1	0.06	30	0.33	1845
AG-SI-108	201	298	< 5	< 0.2	1.11	5	70	< 0.5	< 2	0.53	< 0.5	14	20	24	2.97	< 10	< 1	0.10	30	0.55	2190
AG-SI-109	201	298	< 5	< 0.2	0.94	< 5	60	< 0.5	< 2	0.28	< 0.5	10	17	19	2.29	< 10	1	0.10	30	0.38	1240
AG-SO-001	201	298	< 5	< 0.2	0.74	10	20	< 0.5	< 2	0.13	< 0.5	10	17	22	2.72	< 10	< 1	0.03	10	0.32	400
AG-SO-002	201	298	< 5	< 0.2	0.53	< 5	10	< 0.5	< 2	0.12	< 0.5	9	12	14	2.01	< 10	< 1	0.02	10	0.23	290
AG-SO-003	201	298	< 5	< 0.2	0.61	5	10	< 0.5	< 2	0.11	< 0.5	7	12	15	2.04	< 10	1	0.02	10	0.27	245
AG-SO-004	201	298	< 5	< 0.2	0.79	< 5	20	< 0.5	< 2	0.24	0.5	5	17	16	1.78	< 10	1	0.03	20	0.35	145
AG-SO-005	201	298	< 5	< 0.2	1.08	< 5	30	< 0.5	< 2	0.17	0.5	14	21	24	3.22	< 10	2	0.04	30	0.47	585
AG-SO-006	201	298	< 5	< 0.2	0.54	< 5	40	< 0.5	< 2	0.04	< 0.5	3	9	5	1.38	< 10	2	0.03	10	0.11	70
AG-SO-007	203	205	< 5	0.4	0.47	5	40	< 0.5	< 2	0.21	< 0.5	3	122	9	1.76	< 10	2	0.04	10	0.07	150
AG-SO-008	201	298	< 5	< 0.2	0.55	5	30	< 0.5	< 2	0.30	< 0.5	7	13	17	1.78	< 10	< 1	0.04	10	0.32	390
AG-SO-009	201	298	< 5	< 0.2	0.76	5	20	< 0.5	< 2	0.10	< 0.5	5	14	13	2.67	< 10	< 1	0.03	10	0.21	90
AG-SO-010	203	205	< 5	< 0.2	1.38	< 5	80	< 0.5	< 2	0.18	< 0.5	11	128	17	3.46	< 10	< 1	0.07	10	0.36	835
AG-SO-011	203	205	< 5	< 0.2	1.11	5	80	< 0.5	< 2	0.91	0.5	10	103	41	2.74	< 10	< 1	0.07	20	0.26	1185
AG-SO-012	203	205	< 5	< 0.2	0.65	< 5	50	< 0.5	< 2	0.07	< 0.5	7	119	14	2.64	< 10	< 1	0.06	10	0.21	240
AG-SO-013	203	205	< 5	0.4	0.65	5	70	< 0.5	< 2	0.48	0.5	10	165	19	2.25	< 10	2	0.09	10	0.19	930
AG-SO-014	201	298	< 5	< 0.2	0.42	< 5	30	< 0.5	< 2	0.21	< 0.5	3	11	7	1.37	< 10	< 1	0.04	10	0.14	130
AG-SO-015	203	205	< 5	< 0.2	0.76	< 5	70	< 0.5	< 2	0.10	0.5	6	118	16	2.92	< 10	< 1	0.07	10	0.19	245
AG-SO-016	203	205	< 5	< 0.2	1.21	10	70	< 0.5	< 2	0.18	0.5	13	115	19	3.55	< 10	1	0.10	10	0.51	620
AG-SO-017	201	298	< 5	< 0.2	1.10	10	50	< 0.5	< 2	0.07	< 0.5	8	19	14	2.94	< 10	< 1	0.03	10	0.28	170
AG-SO-018	201	298	< 5	< 0.2	0.62	< 5	20	< 0.5	< 2	0.08	< 0.5	4	14	13	1.95	< 10	< 1	0.04	< 10	0.16	100
AG-SO-019	203	205	< 5	< 0.2	0.91	< 5	80	< 0.5	< 2	0.18	0.5	7	99	14	2.41	< 10	1	0.07	10	0.31	685
AG-SO-020	203	205	< 5	< 0.2	1.79	< 5	130	< 0.5	< 2	0.15	0.5	12	82	33	4.09	< 10	< 1	0.23	10	0.74	520
AG-SO-021	201	298	< 5	< 0.2	0.95	10	40	< 0.5	< 2	0.07	< 0.5	7	22	18	3.67	< 10	< 1	0.05	10	0.35	165

CERTIFICATION: B. Cargill

Chemex Labs Ltd.

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SAMPLE DESCRIPTION	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
AG-SI-041	201	298	< 1	< 0.01	20	630	12	< 5	1	26	0.01	< 10	< 10	15	< 10	68
AG-SI-042	201	298	1	< 0.01	24	490	8	< 5	< 1	21	< 0.01	< 10	< 10	6	< 10	74
AG-SI-043	201	298	1	< 0.01	20	380	6	< 5	< 1	9	0.01	< 10	< 10	8	< 10	66
AG-SI-044	217	298	3	0.02	65	1070	30	< 5	2	41	0.01	< 10	< 10	14	< 10	226
AG-SI-045	203	205	1	0.01	51	1960	38	5	2	75	< 0.01	< 10	10	15	< 10	168
AG-SI-046	203	205	2	< 0.01	39	650	18	< 5	1	23	< 0.01	< 10	< 10	7	< 10	96
AG-SI-047	201	298	< 1	< 0.01	19	760	16	< 5	1	26	0.01	< 10	< 10	23	< 10	68
AG-SI-101	203	205	8	< 0.01	217	30	10	10	1	52	< 0.01	< 10	10	< 1	< 10	358
AG-SI-102	217	298	3	0.01	72	660	14	< 5	< 1	59	0.01	10	70	7	< 10	104
AG-SI-103	217	298	2	< 0.01	59	1370	28	< 5	1	90	0.02	< 10	10	10	< 10	162
AG-SI-104	203	205	1	0.01	25	540	14	< 5	1	47	0.02	< 10	< 10	15	< 10	84
AG-SI-105	217	298	2	< 0.01	34	880	20	5	2	73	0.02	< 10	< 10	22	< 10	108
AG-SI-106	217	298	< 1	0.01	53	800	10	< 5	1	61	0.01	< 10	10	16	< 10	144
AG-SI-107	201	298	< 1	< 0.01	17	350	10	< 5	1	18	0.01	< 10	< 10	17	< 10	58
AG-SI-108	201	298	1	< 0.01	22	530	10	< 5	1	30	0.02	< 10	< 10	14	< 10	92
AG-SI-109	201	298	< 1	< 0.01	19	500	12	5	1	23	0.02	< 10	< 10	12	< 10	68
AG-SO-001	201	298	< 1	< 0.01	21	590	22	< 5	1	9	< 0.01	< 10	< 10	7	< 10	64
AG-SO-002	201	298	1	< 0.01	15	510	14	< 5	< 1	7	< 0.01	< 10	< 10	5	< 10	52
AG-SO-003	201	298	< 1	< 0.01	14	470	10	< 5	< 1	6	< 0.01	< 10	< 10	6	< 10	50
AG-SO-004	201	298	1	< 0.01	15	490	16	< 5	< 1	15	< 0.01	< 10	< 10	7	< 10	54
AG-SO-005	201	298	< 1	< 0.01	21	650	14	5	1	12	< 0.01	< 10	< 10	10	< 10	74
AG-SO-006	201	298	< 1	< 0.01	7	120	12	< 5	< 1	6	< 0.01	< 10	< 10	24	< 10	28
AG-SO-007	203	205	< 1	0.01	10	270	14	< 5	< 1	20	< 0.01	< 10	< 10	17	< 10	34
AG-SO-008	201	298	1	< 0.01	14	510	16	< 5	1	15	0.01	< 10	< 10	9	< 10	46
AG-SO-009	201	298	1	< 0.01	11	160	20	< 5	< 1	10	0.01	< 10	< 10	12	< 10	46
AG-SO-010	203	205	1	0.01	18	360	28	< 5	1	18	0.01	< 10	< 10	21	< 10	74
AG-SO-011	203	205	< 1	0.01	20	730	20	< 5	2	73	0.01	< 10	< 10	17	< 10	82
AG-SO-012	203	205	1	< 0.01	16	550	14	< 5	1	7	0.01	< 10	< 10	13	< 10	70
AG-SO-013	203	205	< 1	0.01	14	490	36	10	1	35	0.01	< 10	< 10	16	< 10	88
AG-SO-014	201	298	< 1	< 0.01	7	180	6	< 5	< 1	14	0.01	< 10	< 10	14	< 10	46
AG-SO-015	203	205	< 1	< 0.01	12	200	24	5	< 1	14	0.01	< 10	< 10	17	< 10	70
AG-SO-016	203	205	1	0.01	23	340	40	5	1	19	0.03	< 10	< 10	25	< 10	138
AG-SO-017	201	298	1	< 0.01	18	170	36	< 5	1	8	0.01	< 10	< 10	17	< 10	66
AG-SO-018	201	298	< 1	< 0.01	8	180	10	< 5	< 1	8	< 0.01	< 10	< 10	12	< 10	46
AG-SO-019	203	205	< 1	0.01	16	290	20	5	1	15	< 0.01	< 10	< 10	13	< 10	84
AG-SO-020	203	205	1	0.01	36	270	18	< 5	2	18	0.01	< 10	< 10	24	< 10	118
AG-SO-021	201	298	1	< 0.01	18	190	12	< 5	1	7	0.03	< 10	< 10	23	< 10	62

MASS 1

CERTIFICATION: B. Cargh

APPENDIX IV

AERODAT REPORT ON AIRBORNE SURVEY

REPORT ON A
COMBINED HELICOPTER-BORNE
MAGNETIC, ELECTROMAGNETIC RADIOMETRIC
AND VLF-EM SURVEY
MASS CLAIMS
LIKELY, BRITISH COLUMBIA
NTS 93 A/11, A/14

FOR

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October 24, 1991

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J9163

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LIST OF MAPS

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~~2.~~ 5 FLIGHT PATH MAP; photo-combination of the base map with flight lines, fiducials and EM anomaly symbols.

~~3.~~ 6 COMPILATION/INTERPRETATION MAP; with base map, flight path map and EM anomaly symbols with interpretation .

~~4.~~ 7 TOTAL FIELD MAGNETIC CONTOURS; with base map and flight lines.

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~~8D.~~ 14 TOTAL COUNT RADIOMETRIC CONTOURS; with digitized base map and flight lines and EM anomaly symbols.

not included in report

REPORT ON A
COMBINED HELICOPTER-BORNE
MAGNETIC, ELECTROMAGNETIC, RADIOMETRIC
AND VLF-EM SURVEY
MASS CLAIMS
LIKELY, BRITISH COLUMBIA

1. INTRODUCTION

This report describes an airborne geophysical survey carried out on behalf of Rio Algom Exploration Inc. by Aerodat Limited under a contract dated September 6, 1991. Principal geophysical sensors included a five frequency electromagnetic system, a high sensitivity cesium vapour magnetometer, a radiometric system and a two frequency VLF-EM system. Ancillary equipment included a colour video tracking camera, a radar altimeter, a power line monitor and a base station magnetometer.

The survey was carried out over an area of about 38.5 square kilometres. The survey area is located approximately 80 km northeast of Williams Lake, B.C. Total survey coverage was approximately 388 line kilometres (381 km traverse plus 7 km magnetic tie lines). The flight line spacing was 100 m. The Aerodat Job Number is J9163.

This report describes the survey, the data processing, data presentation and interpretation of the geophysical results. Electromagnetic anomalies have been identified and appear on selected map products as EM anomaly symbols with interpreted source characteristics. Conductive areas of interest are indicated on an interpretation map with designation number or letter. Prominent structural features interpreted from the magnetic results are also indicated. Recommendations concerning areas with favourable geophysical characteristics are made with reference to this compilation/interpretation map.

2. SURVEY AREA

The survey area is centred over latitude 52 degrees 45' and longitude 121 degrees 20'. The survey block flanks Cariboo Lake to the south and is approximately 20 km northeast of Likely B.C. Area topography is shown on the 1:50,000 scale NTS map sheets 93 A/11 and A/14.

Local relief is rugged with elevations ranging from 2,700 feet to 6,200 feet above mean sea level. The topography generally slopes northwest toward Cariboo Lake from Mount Borland, just outside the southeast part of the area.

The survey area is shown in the attached index map which includes local topography and latitude - longitude coordinates. This index map also appears on all black line map products.

The flight line direction is north 58 degrees east with a line spacing coverage of 100 m. Two magnetic tie lines were flown perpendicular to the flight lines in order assist in leveling the magnetic data.

3. SURVEY PROCEDURES

The survey was flown in the period from Sept. 14 to Sept. 17, 1991. Principal personnel are listed in Appendix IV. A total of five survey flights were required to complete the project.

The aircraft ground speed was maintained at approximately 60 knots (30 metres per second). The nominal EM sensor height was 30 metres, consistent with the safety of the aircraft and crew. The traverse lines were flown using visual navigation and maintaining aircraft headings as the area was too rugged for the use of transponders and an automatic navigation system. The operator also entered manual fiducials over prominent topographic features as seen on a topographic map. Survey lines which showed excessive deviation were re-flown.

Calibration lines are flown at the start, middle (if required) and end of every survey flight. These lines are flown outside of ground effects to record electromagnetic zero levels and radiometric base levels.

4. DELIVERABLES

The results of the survey are presented in a report plus maps. The report is presented in four copies. White print copies of all black line maps are folded and bound with the report. The colour and shadow maps are delivered in four copies. The colour and shadow maps are rolled and delivered in map tube(s).

The black line maps show topography, UTM grid coordinates and the survey boundary. A full list of all map types is given at the beginning of this report. A summary is given following:

MAP NO.	DESCRIPTION
	BLACK LINE
~~1~~ 4	Base Map
~~2~~ 5	Flight Path Map
~~3~~ 6	Compilation/Interpretation Map
~~4~~ 7	Total Field Magnetic Contours
~~5~~ 8	Vertical Magnetic Gradient Contours
~~6~~ 9	Apparent Resistivity Contours - 4,600 Hz
~~7~~ 10	VLF-EM Total Field Contours~~8A Uranium Count Radiometric Contours~~
~~8B~~ 11	Thorium Count Radiometric Contours
~~8C~~ 12	Potassium Count Radiometric Contours } not included in report
~~8D~~ 13	Total Count Radiometric Contours
	COLOUR (Not included in report)
1	Total Field Magnetics
2	Vertical Magnetic Gradient
3	Apparent Resistivity - 4,600 Hz
4	VLF-EM Total Field
5A	HEM Offset Profiles - 860 Hz and 935 Hz
5B	HEM Offset Profiles - 4,175 Hz and 4,600 Hz
5C	HEM Offset Profiles - 32,000 Hz
6	Total Field Magnetic Shadow
7	Multi Parameter Profiles

The processed digital data is organized on 9 track archive tape. Both the profile and the gridded data are saved on tape. A full description of the archive tape(s) is delivered with the tape(s).

All gridded data are also provided on diskettes suitable for displaying on IBM compatible 286 or 386 microcomputers using the Aerodat AXIS (Aerodat Extended Imaging System) or RTI (Real Time Imaging) software package supplied with the report.

All analog records, base station magnetometer records, flight path video tape and original map cronaflexes are delivered with the final presentation.

5. AIRCRAFT AND EQUIPMENT

5.1 Aircraft

A Lama helicopter, (GPUH), piloted by G. Charbonneau, owned and operated by Peace Helicopters Ltd., was used for the survey. S. Arstad of Aerodat acted as navigator and equipment operator. Installation of the geophysical and ancillary equipment was carried out by Aerodat. The survey aircraft was flown at a mean terrain clearance of 60 metres.

5.2 Electromagnetic System

The electromagnetic system was an Aerodat 5-frequency system. Two vertical coaxial coil pairs were operated at 935 Hz and 4,600 Hz and three horizontal coplanar coil pairs at 860, 4,175 and 32,000 Hz. The transmitter-receiver separation was 7 metres. Inphase and quadrature signals were measured simultaneously for the 5 frequencies with a time constant of 0.1 seconds. The HEM bird was towed 30 metres below the helicopter.

5.3 VLF-EM System

The VLF-EM System was a Herz Totem 2A. This instrument measures the total field and vertical quadrature components of two selected frequencies. The sensor was towed in a bird 10 metres below the helicopter.

VLF transmitters are designated "Line" and "Ortho". The line station is that which is in a direction from the survey area which is ideally normal to the flight line direction. This is the VLF station most often used because of optimal coupling with near vertical conductors running perpendicular to the flight line direction . The ortho station is ideally 90 degrees in azimuth away from the line station.

The transmitters used were:

NAA, Cutler, Maine broadcasting at 24.0 kHz. (ortho)

NPM, Laulaualei, Hawaii broadcasting at 23.4 kHz. (line)

5.4 Magnetometer

The magnetometer employed was a Scintrex H8 cesium, optically pumped magnetometer sensor. The sensitivity of this instrument is 0.001 nanoTesla at a 0.2 second sampling rate. The sensor was towed in a bird 15 metres below the helicopter.

5.5 Gamma-Ray Spectrometer

An Exploranium GR-256 spectrometer coupled to 1,024 cubic inches of crystal sensor was used to record four channels of radiometric data. Spectrum stabilization is based on the 662 KeV peak from Cesium sources planted on the crystals.

The four channels recorded and their energy windows were as follows:

Channel	Window
Total Count (TC)	0.83 to 3.00 MeV
Potassium (K)	1.37 to 1.87 MeV
Uranium (U)	1.66 to 1.87 MeV
Thorium (Th)	2.41 to 2.82 MeV

The four channels of radiometric data were recorded at a 1 second update rate (counts per second - cps). Digital recording resolution is 1 cps.

5.6 Ancillary Systems

Base Station Magnetometer

An IFG-2 proton precession magnetometer was operated at the base of operations (Likely, B.C.) to record diurnal variations of the earth's magnetic field. The clock of the base station was synchronized with that of the airborne system to facilitate later correlation. Recording resolution was 1 nT. The update rate was 4 seconds.

External magnetic field variations were recorded on a 3" wide paper chart and in digital form. The analog record shows the magnetic field trace plotted on a grid. Each division of the grid (0.25") is equivalent to 1 minute (chart speed) or 5 nT (vertical sensitivity). The date, time and current total field magnetic value are printed every 10 minutes.

Radar Altimeter

A King KRA-10 radar altimeter was used to record terrain clearance. The output from the instrument is a linear function of altitude.

Tracking Camera

A Panasonic colour video camera was used to record flightpath on VHS video tape. The camera was operated in continuous mode. The flight number, 24 hour clock time (to .01 second), and manual fiducial number are encoded on the video tape.

Analog Recorder

A RMS dot matrix recorder was used to display the data during the survey. Record contents are as follows:

Label	Contents	Scale
MAGF	Total Field Magnetics, Fine	2.5 nT/mm
MAGC	Total Field Magnetics, Course	25 nT/mm
VLT	VLF-EM, Total Field, Line Station	2.5% / mm
VLQ	VLF-EM, Vert. Quadrature, Line Station	2.5% / mm
VOT	VLF-EM, Total Field, Ortho Station	2.5% / mm
VOQ	VLF-EM, Vert. Quadrature, Ortho Station	2.5% / mm
CXI1	935 Hz, Coaxial, Inphase	2.5 ppm/mm
CXQ1	935 Hz, Coaxial, Quadrature	2.5 ppm/mm
CXI2	4,600 Hz, Coaxial, Inphase	2.5 ppm/mm
CXQ2	4,600 Hz, Coaxial, Quadrature	2.5 ppm/mm
CPI1	860 Hz, Coplanar, Inphase	10 ppm/mm
CPQ1	860 Hz, Coplanar, Quadrature	10 ppm/mm
CPI2	4,175 Hz, Coplanar, Inphase	10 ppm/mm
CPQ2	4,175 Hz, Coplanar, Quadrature	10 ppm/mm
CPI3	32,000 Hz, Coplanar, Inphase	20 ppm/mm
CPQ3	32,000 Hz, Coplanar, Quadrature	20 ppm/mm
TC	Total Count Radiometric	50 cps/mm
K	Potassium Count Radiometric	5 cps/mm
UR	Uranium Count Radiometric	5 cps/mm
TH	Thorium Count Radiometric	5 cps/mm
RALT	Radar Altimeter	10 ft/mmPWRL60 Hz
Power Line Monitor		-

Data is recorded with positive - up, negative - down. This does not apply to the VLF data as seen on the analog records which is inverted.

The analog zero of the radar altimeter is 5 cm from the top of the analog record. A helicopter terrain clearance of 60m (197 feet) should therefore be seen some 3 cm from the top of the analog record.

Chart speed is 2mm/second. The 24 hour clock time is printed every 20 seconds. The total magnetic field value is printed every 30 seconds. The ranges from the radar navigation system are printed every minute.

Vertical lines crossing the record are operator activated manual fiducial markers. The start of any survey line is identified by two closely spaced manual fiducials. The end of any survey line is identified by three closely spaced manual fiducials. Manual fiducials are numbered in order. Every tenth manual fiducial is indicated by its number, printed at the bottom of the record.

Calibration sequences are located at the start and end of each flight and at intermediate times where needed.

Digital Recorder

A DGR-33 data system recorded the digital survey data on magnetic media. Contents and update rates were as follows:

DATA TYPE	RECORDING INTERVAL	RECORDING RESOLUTION
Magnetometer	0.2 s	0.001 nT
VLF-EM (4 Channels)	0.2 s	0.03%
HEM (10 Channels)	0.1 s	
coaxial		0.03 ppm
coplanar-4,175/860 Hz		0.06 ppm
coplanar -32 kHz		0.125ppm
Position (2 Channels)	0.2 s	0.1 m
Altimeter	0.2 s	0.05 m
Power Line Monitor	0.2 s	-
Manual Fiducial		
Clock Time		

6. DATA PROCESSING AND PRESENTATION

6.1 Base Map

The base map is taken from a photographic enlargement of the NTS topographic maps. This included the UTM reference grid. (grid lines usually every kilometre) The survey area boundary was added.

After registration of the flight path to the topographic base map, topographic detail and the survey boundary are digitized. This digital image of the base map is used as the base for the colour and shadow maps.

6.2 Flight Path Map

The flight path is recovered using the continuous video record in conjunction with a photomosaic or topographic map. The manual fiducial points are located on the base map and a straight flight path is assumed between fiducials.

The manual fiducials are shown as a small circle and labelled by fiducial number. The 24 hour clock time is shown as a small square, plotted every 30 seconds. Small tick marks are plotted every 2 seconds. Larger tick marks are plotted every 10 seconds. The line and flight numbers are given at the start and end of each survey line.

The flight path map is merged with the base map by matching UTM coordinates from the base maps and the flight path record. The match is confirmed by checking the position of prominent topographic features as recorded by manual fiducial marks or as seen on the flight path video record.

6.3 Electromagnetic Survey Data

The electromagnetic data were recorded digitally at a sample rate of 10 per second with a time constant of 0.1 seconds. A two stage digital filtering process was carried out to reject major sferic events and the reduce system noise.

Local sferic activity can produce sharp, large amplitude events that cannot be removed by conventional filtering procedures. Smoothing or stacking will reduce their amplitude but leave a broader residual response that can be confused with geological phenomena. To avoid this possibility, a computer algorithm searches out and rejects the major sferic events.

The signal to noise ratio was further enhanced by the application of a low pass digital filter. This filter has zero phase shift which prevents any lag or peak displacement from occurring, and it suppresses only variations with a wavelength less than about 0.25 seconds. This low effective time constant gives minimal profile distortion.

Following the filtering process, a base level correction was made using EM zero levels determined during high altitude calibration sequences. The correction applied is a linear function of time that ensures the corrected amplitude of the various inphase and quadrature components is zero when no conductive or permeable source is present. The filtered and leveled data were used in the determination of apparent resistivity (see below).

6.4 Total Field Magnetics

The aeromagnetic data were corrected for diurnal variations by adjustment with the recorded base station magnetic values. Where needed, the magnetic tie line results were used to further level the magnetic data. No corrections for regional variations were applied. The corrected profile data were interpolated on to a regular grid using an Akima spline technique. The grid provided the basis for threading the presented contours. The minimum contour interval is 2 nT. A grid cell size of 25 m was used.

6.5 Vertical Magnetic Gradient

The vertical magnetic gradient was calculated from the gridded total field magnetic data. The calculation is based on a 17 x 17 point convolution in the space domain. The results are contoured using a minimum contour interval of 0.1 nT/m. Grid cell sizes are the same as those used in processing the total field data.

6.6 Apparent Resistivity

The apparent resistivity is calculated by assuming a 200 metre thick conductive layer over resistive bedrock. The computer determines the resistivity that would be consistent with the sensor elevation and recorded inphase and quadrature response amplitudes at the selected frequency. The apparent resistivity profile data were re-interpolated onto a regular grid at a 25 metres true scale interval using an Akima spline technique and contoured using logarithmically arranged contour intervals. The minimum contour interval is 0.1 log(ohm.m).

The highest measurable resistivity is approximately equal to the transmitter frequency. The lower limit on apparent resistivity is rarely reached.

6.7 VLF-EM

The VLF Total Field data from the Line Station is leveled such that a response of 0% is seen in non-anomalous regions. The corrected profile data are interpolated onto a regular grid using an Akima spline technique. The grid provided the basis for threading the presented contours. The minimum contour interval is 1%. Grid cell size is 25 m.

6.8 Radiometric Data

The four channels of radiometric data are subject to a four stage data correction process.

The stages are
- low pass filter (seven point Hanning)
- background removal
- terrain clearance correction
- compton stripping correction

The Compton stripping factors used were

alpha	- 0.26 (Th into U)
beta	- 0.46 (Th into K)
gamma	- 0.72 (U into K)
a	- 0.05 (U into Th)
b	- 0.04 (K into Th)
g	- 0.03 (K into U)

where alpha, beta and gamma are the forward stripping coefficients and a, b, g are the backward stripping coefficients. These coefficients are taken from a calibration test using portable radioactive pads with known concentrations of potassium, uranium and thorium.

The altitude attenuation coefficients used were 0.0072 (TC), 0.0085 (K), 0.0082 (U) and 0.0067 (Th). The units are metres $^{-1}$. These coefficients are taken from GSC publications for similar radiometric systems. Radiometric data were corrected to a mean terrain clearance of 60 m.

The corrected data were interpolated on a square grid (cell size 25m) using an Akima spline technique. The grids provided the basis for threading the presented contours. The minimum contour intervals are 10 cps (TC), 2 cps (K), 1 cps (U) and 1 cps (Th).

7. INTERPRETATION

7.1 Area Geology

The geology of the property was provided by Rio Algom in the form of two outcrop maps which covered most of the survey area. Argillaceous rocks predominate and consist of phyllite, schists, siltstone and mudstone intercalated with arenaceous grit, greywacke and quartzite. Intermediate volcanics, consisting of andesite tuffs and flows, are present in the southwest portion of the survey block. Quartz monzonite gneiss (Quesnel Lake Gneiss) has been mapped in the extreme southwest part of the area. Bedding dips are variable from about 30 to 60 degrees with strikes approximately northwest. Dip directions are predominantly northeast in the eastern two thirds of the area and southwest in the west.

The schists are variably graphitic. Regionally, copper, zinc, gold and silver mineralization is associated with the quartz vein systems which are ubiquitous to the region.

7.2 Magnetic Interpretation

The total field magnetic responses reflect major changes in the magnetite content of the underlying rock units. The amplitude of the magnetic responses relative to the regional background help to assist in identifying specific magnetic and non-magnetic units related to, for example, mafic flows or tuffs, mafic to ultramafic intrusives, felsic intrusives, felsic volcanics and/or sediments etc. Obviously, several geological sources can produce the same magnetic response. These ambiguities can be reduced considerably if basic geological information on the area is available to the geophysical interpreter.

In addition to amplitude variations, magnetic patterns related to the geometry of the particular rock unit also help in determining the probable source of the magnetic response. For instance, long narrow magnetic linears usually reflect mafic tuff or flow horizons while semi-circular features with complex magnetic amplitudes may be produced by local plug like intrusive sources.

The calculated vertical magnetic gradient assists considerably in mapping weaker magnetic linears that are partially masked by nearby higher amplitude magnetic features. The broad zones of higher magnetic amplitude, however, are severely attenuated in the vertical magnetic gradient results. These higher amplitude zones reflect rock units having magnetic susceptibility signatures. For this reason both the total and gradient magnetic data sets must be evaluated.

Theoretically the zero contour of the magnetic gradient map marks the contacts or limits of large magnetic sources. This applies to wide sources, greater than 50 metres, having simple slab geometries and shallow depth.(See discussion in Appendix I) Thus the gradient map also aids in the more accurate delineation of contacts between differing magnetic rock units.

The cross cutting structures shown on the interpretation map are, in part, based on interruptions and discontinuities in the magnetic trends. For this particular survey these structures are more easily identified from the patterns produced by the conductive trends.(see sections to follow) Sharp folding of magnetic and conductive units will produce a magnetic pattern indistinguishable from a fault break. Thus these structures have been designated as fold/fault features.

7.3 Magnetic Survey Results and Conclusions

To facilitate the following discussion of the magnetic results it is suggested that the interpretation map be compared with the total field and vertical gradient magnetic colour contour maps either as overlays or side by side.

The total range of magnetic response over the whole survey block is less than 200 nT from 57,640 nT in the extreme southwest to 57,820 nT in the northeast. Except for a few local anomalies in the southeast quarter of the block, the magnetic anomalies and gradients are gently varying. The transition from the low amplitude magnetic zone in the southwest to the higher amplitude responses in the northeast half of the block occurs as a uniform gradient of approximately 30 nT per kilometre from 57,710 to 57,780 nT.

The amplitude characteristics of the anomalies over the northeast area suggest that the source of the responses may be overlain by more than 200+ metres of non-magnetic cover. Arenaceous and argillaceous rocks, which are the major outcropping rock type, are generally non-magnetic. They may overly a sequence of intermediate to mafic volcanics which are probably the source of the magnetic anomalies seen in the northeast half of the area.

In the southwest, there are several anomalies that have steep gradients indicating the source of these responses is probably sub-cropping. Other local narrow magnetic linears are masked by the regional magnetic gradients and are only seen on the vertical magnetic gradient map but a few appear to have a spatial relationship to conductor trends and have been shown on the interpretation map. All of these anomalies are possibly associated with intermediate volcanic tuffs and flows.

The northeast fold/fault structures are interpreted originally from conductive trend displacements. The structures show some relationship to the magnetic trend interruptions. Good correlation can't be expected if the source of the conductors, the graphitic schists, (see following sections) form an appreciable rock cover over the underlying magnetic sources.

7.4 Electromagnetic Anomaly Selection/Interpretation

Two sets of stacked colour coded profile maps, at a scale of 1:10,000, of the 860 Hz/935 Hz (coplanar/coaxial) and 4,175 Hz/4,600 (coplanar/coaxial) inphase and quadrature responses were used to select conductive anomalies of interest.

Selection of anomalies is based on conductivity as indicated by the inphase to quadrature ratios of the 935 Hz and 4,600 Hz coaxial data, anomaly shape, and anomaly profile characteristics relative to coaxial and coplanar responses.(see discussion and figure in Appendix I) There appears to be very few responses attributable to surficial poor conductivity overburden. Poor conductivity bedrock conductors having low dips, however, will also exhibit responses that may be interpreted as surficial overburden conductors. In such cases, where the source of the conductive response appears to be ambiguous, the anomaly is still selected for plotting. In some situations the conductive response has line to line continuity and some magnetic association providing possible evidence that the response is related to a actual bedrock source.

The calculation of the depth to the conductive source and its conductivity is based on the 935 Hz data using a thin vertical sheet model. The amplitude of the inphase and quadrature responses are used for the calculations which are automatically determined by computer. These data are listed in Appendix II and the depth and conductivity values are shown with each plotted anomaly. Further detailed discussion and illustration of the determination of these values is contained in Appendix I.

The selected anomalies are automatically categorized according to their conductivity and amplitude. The calculation of the conductivity of low amplitude anomalies can be very inaccurate. Therefore, anomalies having amplitudes below a certain level and/or low conductivity value are given a zero rating with the category increasing for increasing conductivity values that are statistically reliable.

7.5 VLF Electromagnetic Survey

This high frequency type of survey, utilizing fixed government communication transmitter stations, tends to detect long strike length and/or surficial poor conductivity sources such as swamps, creeks and rivers. Conductors that are optimum coupled with the primary field will usually predominate over those with other strike directions. In some instances anomalies will be produced by variations in topographic relief.

7.6 Electromagnetic Survey Results and Conclusions

All the conductive responses detected by the survey are located in the southwestern half of the survey area. More than half of the anomaly intercepts have conductivity thickness products exceeding 2 siemens with many high conductivity values exceeding 8 siemens. Most of the conductive responses occur as zones of parallel multiple horizons. Within any one horizon the conductive trends are often discontinuous and/or folded. Line to line continuity of any one particular response is difficult to determine in many cases. Strike directions vary from north-south to east-west.

On the interpretation map an attempt has been made to show the conductive trends from line to line. This presentation produces a conductive structural map of the area. In the central part of the survey block there is a northwest to north trending conductive complex with conductivities in the range of 1 to 4 siemens. Graphitic argillaceous schist occurs in the area and probably is the major source of the conductivity responses.

Further to the southwest, a second but much larger conductive complex is present. Regionally, it appears as a semi-circular feature having a radius of 1.5 km. It is made up of several folded and faulted horizons containing numerous conductive trends.
Starting in the extreme western corner of the survey block, there is a large area containing numerous anomaly intercepts with a dimension of approximately 2.0 km by 0.7 km, parallel and perpendicular respectively, to the flight lines. Designated Fault 1 cuts southeast through the area. Conductor strikes in this area vary from northwest, (note the flat broad response on the tie line) to southwest. The latter direction parallels the flight lines and produces broad flat conductive responses as seen on the western end of lines 10010, 10020 and 10030.

Two main horizons, containing multiple conductors, trend eastwards, for about 2 km., from the conductor complex just described. These horizons then fold sharply south and then appear to be cut off. It appears that the faulted (Fault 2) continuation of these two horizons manifests itself further to the southeast as a cluster of anomalies that generally have strike directions parallel to sub-parallel to the survey lines. There is a suggestion that the conductors fold back on themselves near the southwest boundary of the survey block.

The apparent resistivity colour contour map of this area gives a more generalized picture of the conductive structures and the folding and faulting indicated on the interpretation map. Reference to the resistivity colour map is recommended for further clarification.

The general overall shape of the complex, including conformable narrow magnetic trends that occur within or flanking some of the horizons, suggests a synclinal structure may be present. Local geological information on an area just north of the east end of Fault 2, indicates that the conductive responses are probably related to locally graphitic siltstone and shale. The formational characteristics and sharp folding suggests that most of the other conductive effects in the region can be attributed to graphitic sediments.

The VLF electromagnetic results partially detected the five frequency EM data responses in some local areas. Additional conductive responses were observed throughout the area, but, on comparison with the topography map, the VLF anomalous zones appeared to be related to changes in elevation and drainage patterns. As was the case with the magnetic results, there was some spatial relationship to the interpreted fold/fault structures and the VLF anomaly patterns.

7.7 Radiometric Interpretation

The ability to detect natural occurring radiation, whether on the ground or from an airborne platform, depends on a number of factors listed as follows:

Count Time
Measurements or count rate statistics are more reliable the longer the detector is in position over a particular location. Therefore in airborne surveying, traverse speed is an important factor in detecting radiation sources. For this reason STOL aircraft and helicopters are a favoured platform for radiometric surveys.

Detector size
The detector crystal volume and thickness determine the sensitivity of the radiometric system to radiation. For accurate measurement and differentiation of higher energy levels of radiation, a large crystal volume is a pre-requisite.

Distance from Source (Altitude)
The attenuation or absorption of radiation in air, although not a significant factor in ground surveys, is a factor in airborne surveys. Normalization of the radiation amplitude data for altitude variations of the aircraft during the survey is necessary. The attenuation is not significant for large areal sources of radiation but is quite severe for localized point sources.

Overburden Cover
Radiation can be completely masked by one foot of rock or three feet of unconsolidated overburden.

Source Geometry
A large exposed outcrop of slightly radioactive material, such as granite which usually has a high potassium count, will be easily detectable from the air. A small outcrop of highly radioactive material, containing an appreciable amount of pitchblende for instance, may not be detectable unless the sensor passes directly over the outcrop and/or is quite close to it.

Source Characteristics
The type and percentage concentration of radioactive minerals present in the rock will determine radiation amplitudes and therefore the ability of the sensor to measure the radiation.

The above factors must be taken into consideration when evaluating and interpreting radiometric surveys. Variations in radiation amplitudes may only be a factor of overburden cover. As a result, an outcrop map of the survey area, and/or a resistivity map, is very useful for initial evaluation of radioactive element concentrations.

Shales and felsic intrusives tend to have high potassium and thorium levels. Mafic intrusives, sandstone and especially limestone have concentrations of one half to one tenth of the highest levels. Specific intrusives types, such as pegmatites, can have levels of potassium, uranium and thorium, in the order of three to four times the amounts normally present. Uranium ore can contain concentrations of radioactive minerals one to four orders of magnitude greater than normally encountered.

Thus, interpretation of the source of radioactive anomalies, even when the uranium, thorium and potassium thresholds are separated, can be difficult and ambiguous. In some geological environments, specific rock units have higher or lower uranium/thorium, uranium/potassium, or thorium/potassium ratios. Additional diagnostic information is sometimes available when such ratio maps are generated and compared to known geological parameters.
For this interpretation, amplitude characteristics for the various channels will be discussed relative to the features mapped by the magnetic and electromagnetic results.

7.8 Radiometric Survey Results and Conclusions

Background total count rates are approximately 100 cps to 150 cps near Cariboo Lake and in drainage areas. Over the higher elevation areas the count rate increases to about 50 to 100 cps above background. The higher amplitude values correspond approximately to areas of higher topography.

The elevated potassium count rates generally correspond to the higher amplitude total count rates suggesting the main source of radiation is potassium. The source of the elevated potassium is possibly associated with the sediments having thin overburden cover in the topographically higher portions of the property.

The uranium and thorium count maps (NOT PART OF REPORT) generally exhibit background amplitude levels throughout the area. One exception is a thorium anomaly located in the very central part of the survey block northeast of Frank Creek. The source of this anomaly is unknown.

The radiometric results do not appear to be mapping any specific lithology in the area.

8. RECOMMENDATIONS

Notwithstanding graphitic schists are probably the main source of the conductive responses on the property, the structures mapped by these conductors may be important for the emplacement or occurrence of base and precious metal mineralization. Areas of interest may be the axis of hinge folds, fault zones and conductive areas having association with magnetic responses. In addition, isolated higher conductivity anomalous zones may indicate areas of exploration interest.

As a guide to further exploration, several areas have been designated on the interpretation map for ground investigation. Note that many of the conductive complexes are parallel to sub- parallel to the flight lines. As a result the conductive trends are not defined in detail. Careful selection of grid line direction is required to maximize conductor response if an electromagnetic survey is contemplated. In areas of rough topography the horizontal shootback method is often preferred over more conventional horizontal loop electromagnetic systems and is recommended for this property.

A combination of geophysics, geology and/or geochemistry is recommended for followup exploration on the following areas:

Area A
Attributes: fold zone and high conductivity responses

Area B
Attributes: localized high conductivity responses

Area C
Attributes: fold zone, faulting and high conductivity responses

Area D
Attributes: localized high conductivity responses

Area E
Attributes: high conductivity responses

Area F
Attributes: fold zone and high conductivity responses

Area G
Attributes: high conductivity responses and magnetic association

No prioritization is assigned to any of the above areas.

Respectfully submitted,

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Consulting Geophysicist

for

AERODAT LIMITED

October 24, 1991
J9163

REGISTERED PROFESSIONAL ENGINEER
R. W. WOOLHAM
PROVINCE OF ONTARIO

APPENDIX I

GENERAL INTERPRETIVE CONSIDERATIONS

APPENDIX I

GENERAL INTERPRETIVE CONSIDERATIONS

Electromagnetic

The Aerodat four frequency system utilizes two different transmitter-receiver coil geometries. The traditional coaxial coil configuration is operated at two widely separated frequencies. The horizontal coplanar coil configuration is similarly operated at two different frequencies where at least one pair is approximately aligned with one of the coaxial frequencies.

The electromagnetic response measured by the helicopter system is a function of the "electrical" and "geometrical" properties of the conductor. The "electrical" property of a conductor is determined largely by its electrical conductivity, magnetic susceptibility and its size and shape; the "geometrical" property of the response is largely a function of the conductor's shape and orientation with respect to the measuring transmitter and receiver.

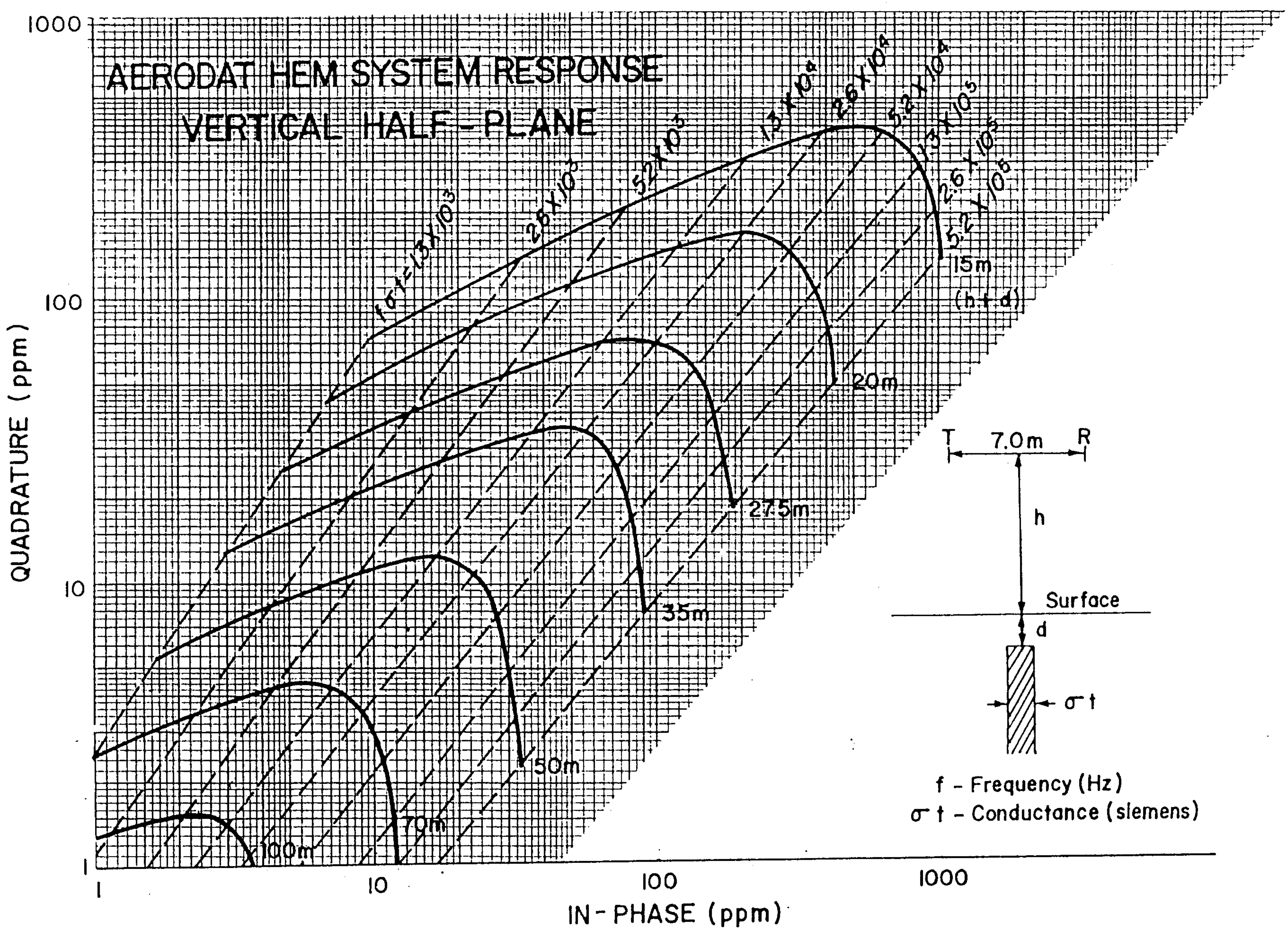
Electrical Considerations

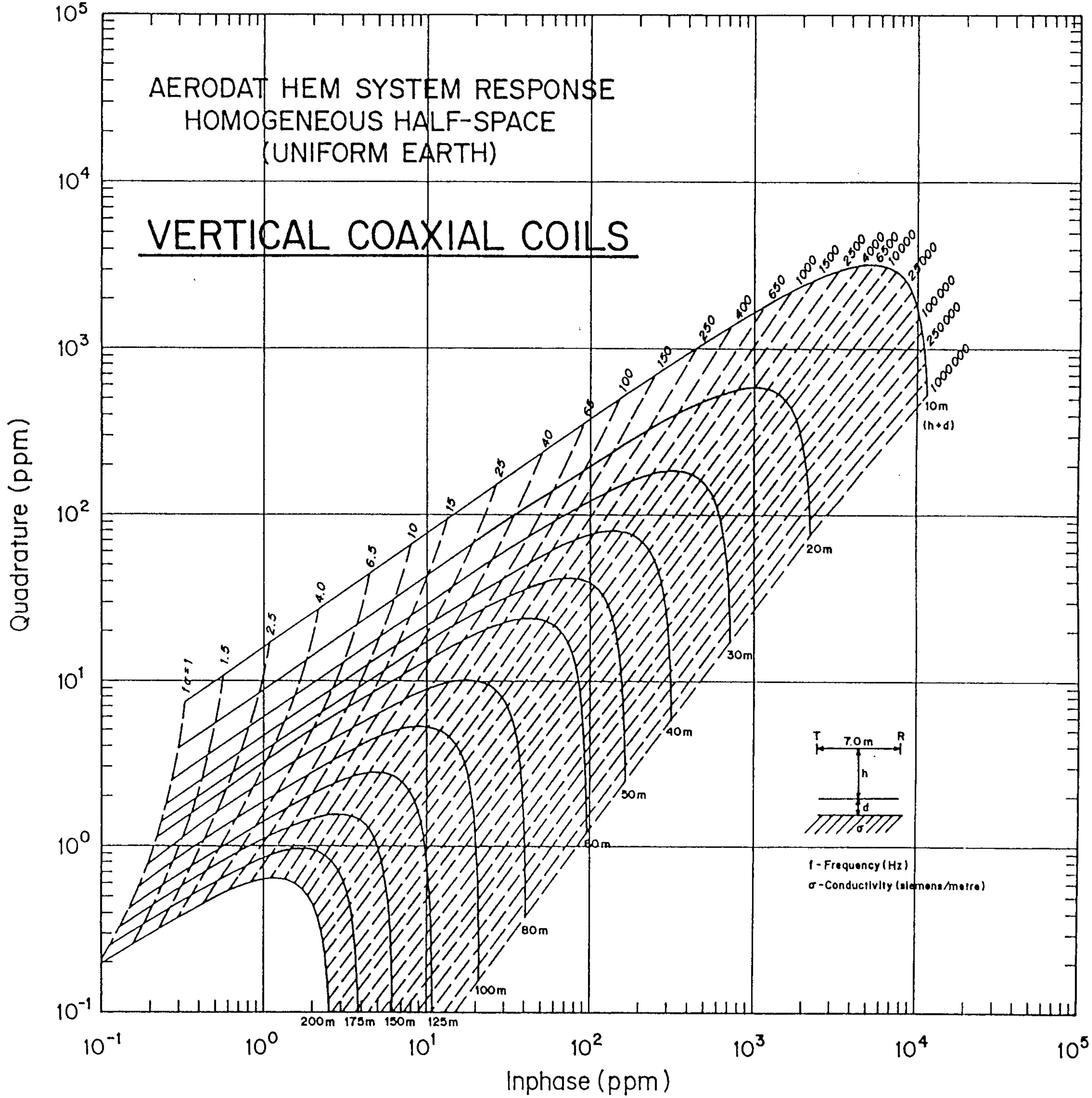
For a given conductive body the measure of its conductivity or conductance is closely related to the measured phase shift between the received and transmitted electromagnetic field. A small phase shift indicates a relatively high conductance, a large phase shift lower conductance. A small phase shift results in a large inphase to quadrature ratio and a large phase shift a low ratio. This relationship is shown quantitatively for non-magnetic vertical half-plane and half-space models on the accompanying phasor diagrams. Other physical models will show the same trend but different quantitative relationships.

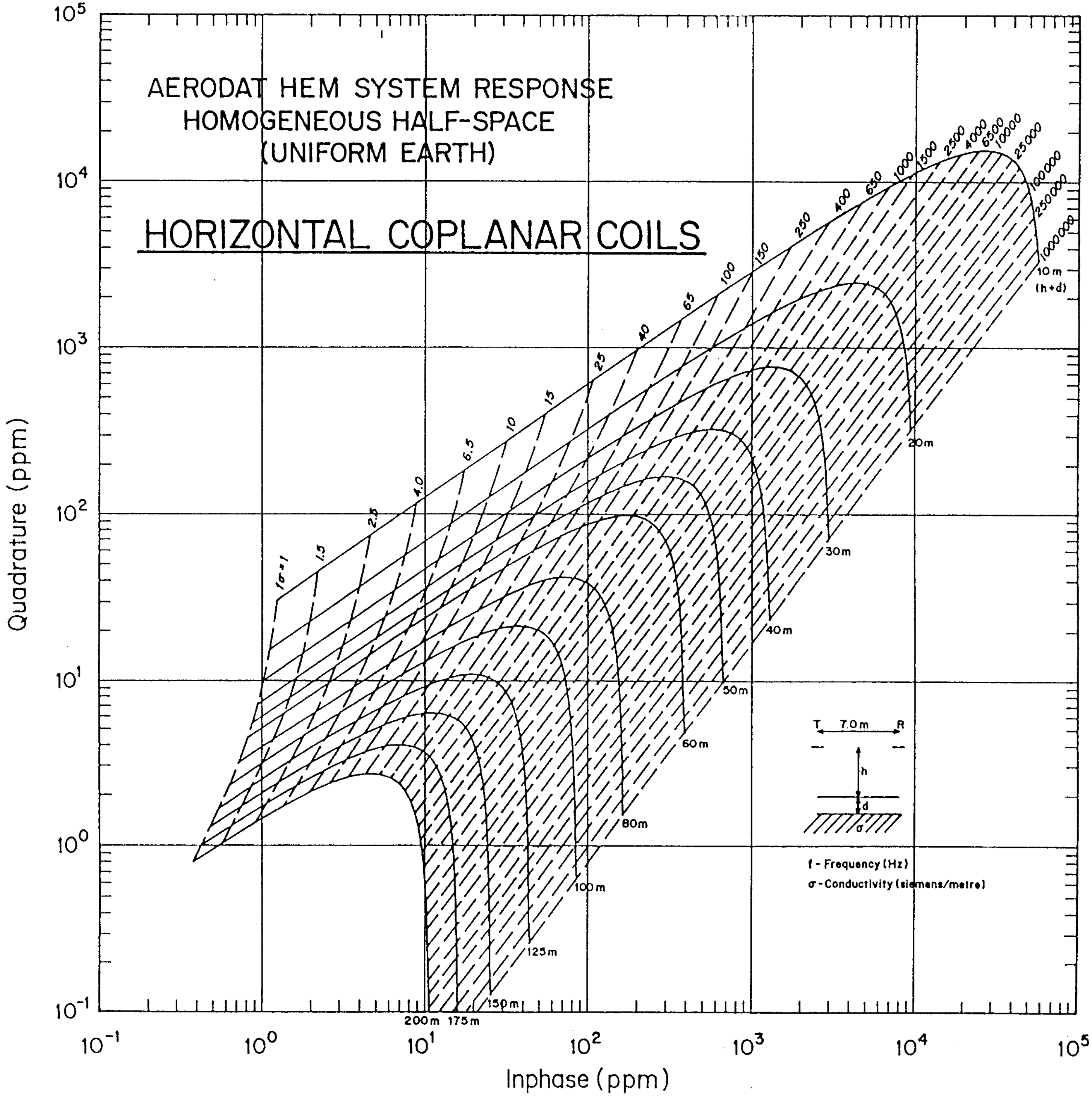
The phasor diagram for the vertical half-plane model, as presented, is for the coaxial coil configuration with the amplitudes in parts per million (ppm) of the primary field as measured at the response peak over the conductor. To assist the interpretation of the survey results the computer is used to identify the apparent conductance and depth of selected anomalies. The results of this calculation are presented in anomaly listings included in the survey report and the conductance and inphase amplitude are presented in symbolized form on the map presentation.

The conductance estimate is most reliable when anomaly amplitudes are large and background resistivities are high. Where the EM anomaly is of low amplitude and background resistivities are low, the conductance estimates are much less reliable. In such situations, the conductance estimate is often quite low regardless of the true nature of the conductor. This is due to the elevated background response levels in the quadrature channel. In an extreme case, the conductance estimate should be discounted and should not prejudice target selection.

The conductance and depth values as presented are correct only as far as the model approximates the real geological situation. The actual geological source may be of limited length, have significant dip, or may be strongly magnetic. Its conductivity and thickness may vary with depth


AERODAT HEM SYSTEM RESPONSE
VERTICAL HALF-PLANE
f σ t = 1.3 X 10³
2.6 X 10³
5.2 X 10³
1.3 X 10⁴
2.6 X 10⁴
5.2 X 10⁴
1.3 X 10⁵
2.6 X 10⁵
5.2 X 10⁵
15m
(h+d)
20m
27.5m
35m
50m
70m
100m
QUADRATURE (ppm)
IN-PHASE (ppm)
1000
100
10
1
T
7.0m
R
h
Surface
d
σ t
f - Frequency (Hz)
σ t - Conductance (siemens)


AERODAT HEM SYSTEM RESPONSE
HOMOGENEOUS HALF-SPACE
(UNIFORM EARTH)
VERTICAL COAXIAL COILS
Quadrature (ppm)
Inphase (ppm)
10m (h+d)
20m
30m
40m
50m
60m
80m
100m
200m 175m 150m 125m
T 7.0m R
h
d
σ
f - Frequency (Hz)
σ - Conductivity (siemens/metre)



AERODAT HEM SYSTEM RESPONSE
HOMOGENEOUS HALF-SPACE
(UNIFORM EARTH)
HORIZONTAL COPLANAR COILS
Quadrature (ppm)
Inphase (ppm)
10 m
(h+d)
20m
30m
40m
50m
60m
80m
100m
125m
150m
200m 175m
T 7.0m R
h
d
σ
f - Frequency (Hz)
σ - Conductivity (siemens/metre)

and/or strike and adjacent bodies and overburden may have modified the response. In general the conductance estimate is less affected by these limitations than is the depth estimate, but both should be considered as relative rather than absolute guides to the anomaly's properties.

Conductance in mhos is the reciprocal of resistance in ohms and in the case of narrow slab-like bodies is the product of electrical conductivity and thickness.

The higher ranges of conductance, greater than 2-4 mhos, indicate that a significant fraction of the electrical conduction is electronic rather than electrolytic in nature. Materials that conduct electronically are limited to certain metallic sulphides and to graphite. High conductance anomalies, roughly 10 mhos or greater, are generally limited to massive sulphides or graphites.

Sulphide minerals, with the exception of such ore minerals as sphalerite, cinnabar and stibnite, are good conductors. Sulphides may occur in a disseminated manner that inhibits electrical conduction through the rock mass. In this case the apparent conductance can seriously underrate the quality of the conductor in geological terms. In a similar sense the relatively non-conducting sulphide minerals noted above may be present in significant concentrations in association with minor conductive sulphides, and the electromagnetic response will only relate to the minor associated mineralization. Indicated conductance is also of little direct significance for the identification of gold mineralization. Although gold is highly conductive, it would not be expected to exist in sufficient quantity to create a recognizable anomaly. Minor accessory sulphide mineralization may however provide a useful indirect indication.

In summary, the estimated conductance of a conductor can provide a relatively positive identification of significant sulphide or graphite mineralization. A moderate to low conductance value does not rule out the possibility of significant economic mineralization.

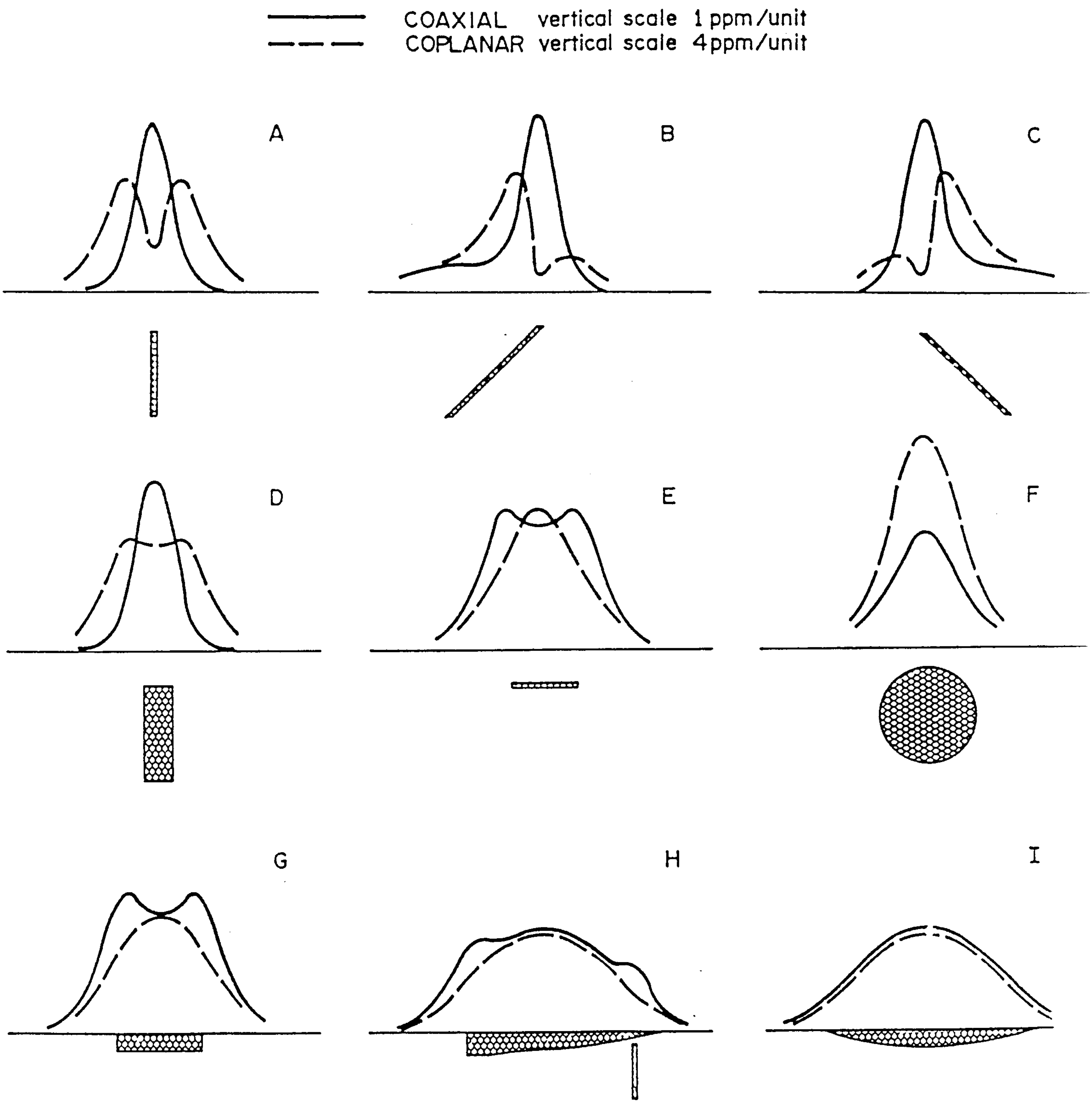
Geometrical Considerations

Geometrical information about the geologic conductor can often be interpreted from the profile shape of the anomaly. The change in shape is primarily related to the change in inductive coupling among the transmitter, the target, and the receiver. The accompanying figure shows a selection of HEM response profile shapes from nine idealized targets. Response profiles are labelled A through I. These labels are used in the discussion which follows.

In the case of a thin, steeply dipping, sheet-like conductor, the coaxial coil pair will yield a near symmetric peak over the conductor. On the other hand, the coplanar coil pair will pass through a null couple relationship and yield a minimum over the conductor, flanked by positive side lobes.(Profile A) As the dip of the conductor decrease from vertical, the coaxial anomaly shape changes only slightly, but in the case of the coplanar coil pair the side lobe on the down dip side strengthens relative to that on the up dip side.(Profiles B and C).

As the thickness of the conductor increases, induced current flow across the thickness of the

HEM RESPONSE PROFILE SHAPE AS AN INDICATOR OF CONDUCTOR GEOMETRY



conductor becomes relatively significant and complete null coupling with the coplanar coils is no longer possible.(Profile D) As a result, the apparent minimum of the coplanar response over the conductor diminishes with increasing thickness, and in the limiting case of a fully 3 dimensional body or a horizontal layer or half-space, the minimum disappears completely.

A horizontal conducting layer such as a horizontal thin sheet or overburden will produce a response in the coaxial and coplanar coils that is a function of altitude (and conductivity if not uniform). The profile shape will be similar in both coil configurations with an amplitude ratio (coplanar:coaxial) of about 4:1*.(Profiles E and G).

In the case of a spherical conductor, the induced currents are confined to the volume of the sphere, but not relatively restricted to any arbitrary plane as in the case of a sheet-like form. The response of the coplanar coil pair directly over the sphere may be up to 8* times greater than that of the coaxial pair.(Profile F)

In summary, a steeply dipping, sheet-like conductor will display a decrease in the coplanar response coincident with the peak of the coaxial response. The relative strength of this coplanar null is related inversely to the thickness of the conductor. A pronounced null indicates a relatively thin conductor. The dip of such a conductor can be inferred from the relative amplitudes of the side-lobes.

Massive conductors that could be approximated by a conducting sphere will display a simple single peak profile form on both coaxial and coplanar coils, with a ratio between the coplanar to coaxial response amplitudes as high as 8*.

Overburden anomalies often produce broad poorly defined anomaly profiles.(Profile I) In most cases, the response of the coplanar coils closely follows that of the coaxial coils with a relative amplitude ratio of 4*.

Occasionally, if the edge of an overburden zone is sharply defined with some significant depth extent, an edge effect will occur in the coaxial coils. In the case of a horizontal conductive ring or ribbon, the coaxial response will consist of two peaks, one over each edge; whereas the coplanar coil will yield a single peak.(Profile H)

* It should be noted at this point that Aerodat's definition of the measured ppm unit is related to the primary field sensed in the receiving coil without normalization to the maximum coupled (coaxial configuration). If such normalization were applied to the Aerodat units, the amplitude of the coplanar coil pair would be halved.

Magnetics

The Total Field Magnetic Map shows contours of the total magnetic field, uncorrected for regional variation. Whether an EM anomaly with a magnetic correlation is more likely to be caused by a sulphide deposit than one without depends on the type of mineralization. An apparent coincidence between an EM and a magnetic anomaly may be caused by a conductor which is also magnetic, or by a conductor which lies in close proximity to a magnetic body. The majority of conductors which are also magnetic are sulphides containing pyrrhotite and/or magnetite. Conductive and magnetic bodies in close association can be, and often are, graphite and magnetite. It is often very difficult to distinguish between these cases. If the conductor is also magnetic, it will usually produce an EM anomaly whose general pattern resembles that of the magnetics. Depending on the magnetic permeability of the conducting body, the amplitude of the inphase EM anomaly will be weakened, and if the conductivity is also weak, the inphase EM anomaly may even be reversed in sign.

The interpretation of contoured aeromagnetic data is a subject on its own involving an array of methods and attitudes. The interpretation of source characteristics for example from total field results is often based on some numerical modelling scheme. The vertical gradient data is more legible in some aspects however and useful inferences about source characteristics can often be read off the contoured VG map.

The zero contour lines in contoured VG data are often sited as a good approximation to the outline of the top of the magnetic source. This only applies to wide (relative to depth of burial) near vertical sources at high magnetic latitudes. It will give an incorrect interpretation in most other cases.

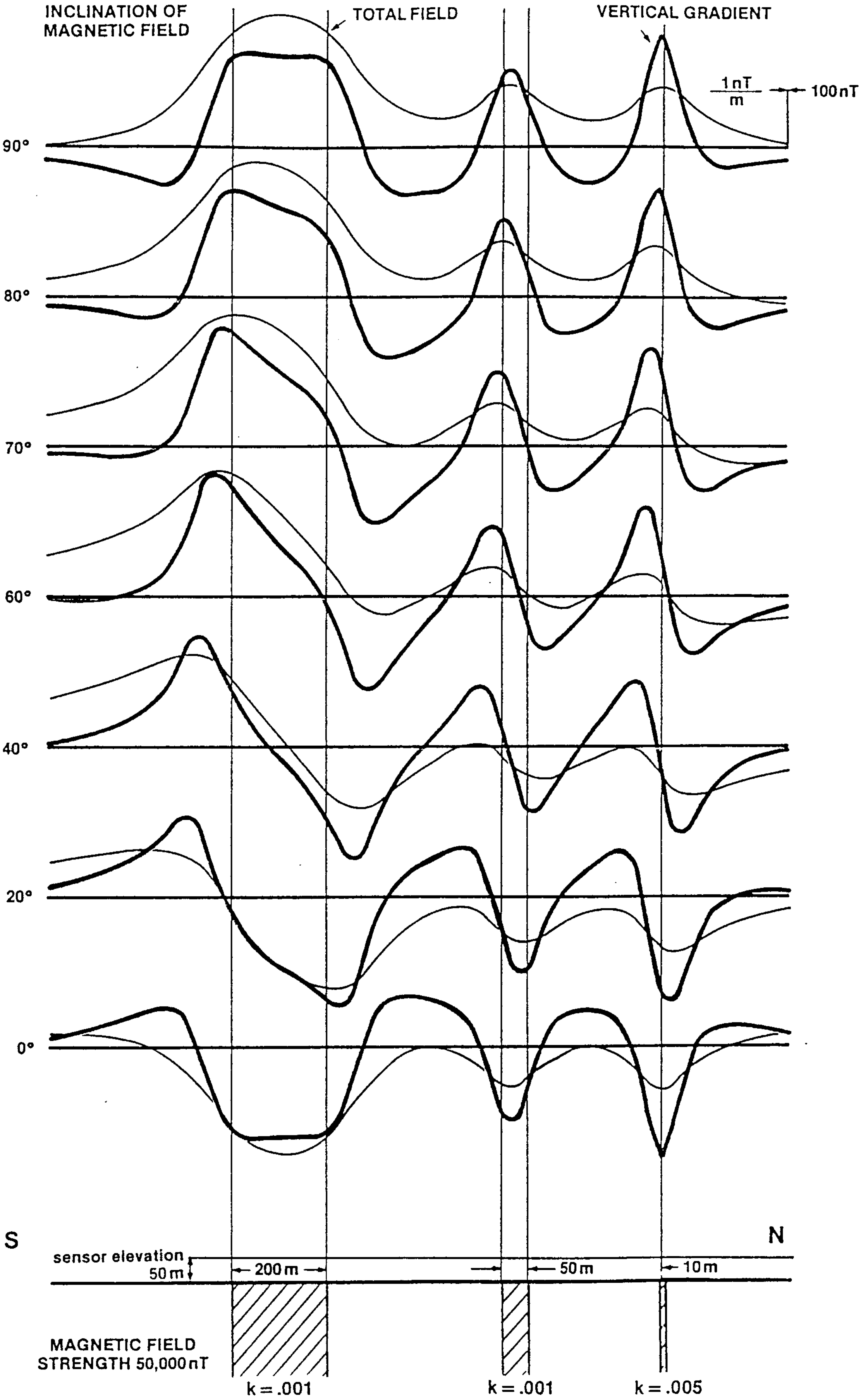
Theoretical profiles of total field and vertical gradient anomalies from tabular sources at a variety of magnetic inclinations are shown in the attached figure. Sources are 10, 50 and 200 m wide. The source-sensor separation is 50 m. The thin line is the total field profile. The thick line is the vertical gradient profile.

The following comments about source geometry apply to contoured vertical gradient data for magnetic inclinations of 70 to 80°.

Outline

Where the VG anomaly has a single sharp peak, the source may be a thin near-vertical tabular source. It may be represented as a magnetic axis or as a tabular source of measureable width - the choice is one of geological preference.

Where the VG anomaly has a broad, flat or inclined top, the source may be a thick tabular source. It may be represented as a thick body where the width is taken from the zero contour lines if the body dips to magnetic north. If the source appears to be dipping to the south (i.e. the VG anomaly is asymmetric), the zero contours are less reliable indicators of outline. The southern most zero contour line should be ignored and the outline taken from the northern zero contour line and the extent of the anomaly peak width.


INCLINATION OF MAGNETIC FIELD
TOTAL FIELD
VERTICAL GRADIENT
1nT/m
100nT
90°
80°
70°
60°
40°
20°
0°
S
N
sensor elevation 50 m
200 m
50 m
10 m
MAGNETIC FIELD STRENGTH 50,000 nT
k = .001
k = .001
k = .005

Dip

A symmetrical vertical gradient response is produced by a body dipping to magnetic north. An asymmetrical response is produced by a body which is vertical or dipping to the south. For southern dips, the southern most zero contour line may be several hundred meters south of the source.

Depth of Burial

The source-sensor separation is about equal to half of the distance between the zero contour lines for thin near-vertical sources. The estimated depth of burial for such sources is this separation minus 50 m. If a variety of VG anomaly widths are seen in an area, use the narrowest width seen to estimate local depths.

VLF Electromagnetics

The VLF-EM method employs the radiation from powerful military radio transmitters as the primary signals. The magnetic field associated with the primary field is locally horizontal and normal to a line pointing at the transmitter.

The Herz Totem uses three coils in the X, Y, Z configuration to measure the total field and vertical quadrature component from two VLF stations. These stations are designated Line and Ortho. The line station is ideally in a direction from the survey area at right angles to the flight line direction. Conductors normal to the flight line direction point at the line station and are therefore optimally coupled to VLF magnetic fields and in the best situation to gather secondary VLF currents. The ortho station is ideally 90 degrees in azimuth from the line station.

The relatively high frequency of VLF (15-25) kHz provides high response factors for bodies of low conductance. Relatively "disconnected" sulphide ores have been found to produce measurable VLF signals. For the same reason, poor conductors such as sheared contacts, breccia zones, narrow faults, alteration zones and porous flow tops normally produce VLF anomalies. The method can therefore be used effectively for geological mapping. The only relative disadvantage of the method lies in its sensitivity to conductive overburden. In conductive ground the depth of exploration is severely limited.

The effect of strike direction is important in the sense of the relation of the conductor axis relative to the energizing electromagnetic field. A conductor aligned along a radius drawn from a transmitting station will be in a maximum coupled orientation and thereby produce a stronger response than a similar conductor at a different strike angle. Theoretically, it would be possible for a conductor, oriented tangentially to the transmitter to produce no signal. The most obvious effect of the strike angle consideration is that conductors favourably oriented with respect to the transmitter location and also near perpendicular to the flight direction are most clearly rendered and usually dominate the map presentation.

The total field anomaly is an indicator of the existence and position of a conductor. The response will be a maximum over the conductor, without any special filtering, and strongly favour the upper edge of the conductor even in the case of a relatively shallow dip.

Conversely a negative total field anomaly is often seen over local resistivity highs. This is because the VLF field produces electrical currents which flow towards (or away from) the transmitter. These currents are gathered into a conductor and are taken from resistive bodies. The VLF system sees the currents gathered into the conductor as a total field high. It sees the relative absence of secondary currents in the resistor as a total field low.

As noted, VLF anomaly trends show a strong bias towards the VLF transmitter. Structure which is normal to this direction may have no associated VLF anomaly but may be seen as a break or interruption in VLF anomalies. If these structures are of particular interest, maps of the ortho station data may be worthwhile.

Conductive overburden will obscure VLF responses from bedrock sources and may produce low amplitude, broad anomalies which reflect variations in the resistivity or thickness of the overburden.

Extreme topographic relief will produce VLF anomalies which may bear no relationship to variations in electrical conductivity. Deep gullies which are too narrow to have been surveyed at a uniform sensor height often show up as VLF total field lows. Sharp ridges show up as total field highs.

The vertical quadrature component over steeply dipping sheet-like conductor will be a cross-over type response with the cross-over closely associated with the upper edge of the conductor.

The response is a cross-over type due to the fact that it is the vertical rather than total field quadrature component that is measured. The response shape is due largely to geometrical rather than conductivity considerations and the distance between the maximum and minimum on either side of the cross-over is related to target depth. For a given target geometry, the larger this distance the greater the depth.

The vertical quadrature component is rarely presented. Experience has shown the total field to be more sensitive to bedrock conductors and less affected by variations in conductive overburden.

AERODAT LIMITED
June, 1991.

APPENDIX II

ANOMALY LISTINGS

J9163

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
102	10010	A	2	24.0	18.6	2.0	93	-53
102	10010	B	1	21.0	17.7	1.7	96	-56
102	10010	C	2	17.6	12.4	2.0	100	-54
102	10010	D	2	18.7	10.5	2.8	100	-52
102	10010	E	2	15.6	9.6	2.3	105	-55
102	10010	F	0	12.0	1.2	25.8	130	-66
102	10010	G	5	15.4	2.4	15.1	125	-67
102	10010	H	1	20.3	22.0	1.2	110	-73
102	10010	J	1	29.7	32.1	1.4	106	-74
102	10010	K	2	33.3	26.3	2.2	109	-73
102	10010	M	0	9.1	16.0	0.4	109	-71
102	10010	N	0	26.6	37.9	0.9	90	-61
102	10010	O	0	27.0	42.4	0.8	87	-59
102	10010	P	0	25.3	39.9	0.8	88	-60
102	10010	Q	1	29.6	33.1	1.3	92	-60
102	10010	R	0	18.4	26.2	0.8	95	-62
102	10010	S	0	19.3	27.2	0.8	91	-58
102	10010	T	1	19.7	20.1	1.3	98	-59
102	10010	U	0	12.6	16.5	0.7	99	-59
102	10010	V	0	13.7	17.1	0.8	93	-53
102	10010	W	0	15.8	19.2	0.9	91	-53
102	10010	X	1	18.5	17.8	1.3	97	-57
102	10010	Y	1	21.3	19.6	1.5	96	-57
102	10010	Z	1	21.2	22.4	1.2	92	-55
102	10010	AA	1	19.0	21.1	1.1	91	-54
102	10010	AB	0	1.5	6.9	0.0	97	-59
102	10010	AC	0	0.6	8.7	0.0	84	-60
102	10020	A	0	10.2	12.1	0.8	105	-60
102	10020	B	0	10.2	12.0	0.8	104	-58
102	10020	C	1	8.4	7.5	1.1	107	-52
102	10020	D	1	9.6	6.4	1.8	119	-61
102	10020	E	1	11.8	8.2	1.8	113	-60
102	10020	F	1	10.6	8.5	1.4	113	-60
102	10020	G	2	13.2	8.8	2.0	114	-63
102	10020	H	0	12.0	14.0	0.9	104	-61
102	10020	J	0	18.0	29.0	0.6	92	-61
102	10020	K	0	18.0	29.6	0.6	94	-63
102	10020	M	4	31.0	8.5	8.7	118	-74
102	10020	N	4	30.2	8.7	8.1	117	-73
102	10020	O	4	33.7	6.3	14.9	115	-71
102	10020	P	0	20.5	0.8	108.6	118	-64
102	10020	Q	0	17.7	0.9	72.6	122	-65
102	10020	R	3	12.9	3.4	7.0	121	-61

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

J9163

FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
102	10020	S	4	20.8	5.4	8.3	105	-54
102	10020	T	4	17.8	4.5	8.2	103	-49
102	10020	U	3	12.1	3.9	5.2	115	-55
102	10020	V	3	12.0	2.9	7.7	116	-55
102	10030	A	5	19.5	2.1	26.8	82	-28
102	10030	B	5	22.7	3.7	15.9	77	-27
102	10030	C	4	18.0	3.2	13.3	81	-26
102	10030	D	4	17.3	3.2	12.4	87	-32
102	10030	E	0	16.0	1.9	22.2	89	-32
102	10030	F	0	13.8	0.7	68.0	114	-52
102	10030	G	5	18.0	2.3	20.8	109	-54
102	10030	H	4	17.6	2.9	14.6	108	-53
102	10030	J	4	11.4	2.4	9.2	126	-62
102	10030	K	5	20.0	3.0	17.2	111	-58
102	10030	M	4	18.2	3.3	12.9	113	-59
102	10030	N	1	15.6	11.1	1.9	92	-44
102	10030	O	1	16.4	11.7	1.9	90	-43
102	10030	P	2	22.1	10.4	3.8	95	-49
102	10030	Q	0	14.7	18.8	0.8	79	-40
102	10030	R	1	15.4	14.2	1.3	82	-38
102	10030	S	2	11.3	6.1	2.5	102	-45
102	10030	T	0	5.2	7.4	0.4	90	-38
102	10030	U	1	14.0	9.9	1.9	90	-41
102	10030	V	0	1.4	3.4	0.1	110	-50
102	10040	A	1	12.5	11.8	1.2	88	-42
102	10040	B	0	8.4	12.9	0.5	78	-36
102	10040	C	0	9.0	12.1	0.6	82	-38
102	10040	D	0	7.8	12.9	0.4	81	-40
102	10040	E	3	26.4	9.7	5.6	90	-44
102	10040	F	1	22.5	20.6	1.6	78	-39
102	10040	G	0	14.2	17.4	0.9	78	-38
102	10040	H	2	11.6	6.1	2.6	100	-44
102	10040	J	2	10.0	6.0	2.1	100	-42
102	10040	K	2	9.7	5.6	2.2	98	-39
102	10040	M	1	10.0	6.5	1.8	103	-46
102	10040	N	2	12.2	5.4	3.4	104	-46
102	10040	O	0	8.1	8.4	0.9	109	-57
102	10040	P	3	16.8	4.6	7.2	102	-48
102	10040	Q	4	19.5	4.3	10.1	98	-45
102	10040	R	4	18.2	3.0	14.7	102	-47
102	10040	S	5	31.8	5.5	16.2	95	-50
102	10040	T	5	24.0	2.7	26.8	99	-49
102	10040	U	4	42.0	12.7	8.3	76	-37

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
102	10040	V	5	63.4	11.1	19.4	70	-35
102	10040	W	6	64.5	7.5	33.6	68	-32
102	10040	X	6	42.1	4.3	35.6	68	-27
102	10040	Y	5	34.0	4.0	27.7	73	-28
102	10040	Z	4	18.1	4.0	9.9	74	-21
102	10050	A	3	25.5	8.6	6.2	54	-8
102	10050	B	3	35.1	11.4	7.2	49	-8
102	10050	C	3	30.8	10.6	6.4	51	-8
102	10050	D	5	25.7	3.8	18.8	69	-21
102	10050	E	5	69.6	12.5	19.2	58	-24
102	10050	F	5	79.2	17.4	15.3	58	-26
102	10050	G	5	71.5	11.3	23.0	61	-27
102	10050	H	5	65.9	12.9	16.9	67	-33
102	10050	J	3	25.9	12.2	4.0	84	-40
102	10050	K	2	5.8	2.8	2.3	122	-49
102	10050	M	4	20.8	4.8	9.7	109	-58
102	10050	N	4	29.9	7.1	10.4	99	-54
102	10050	O	3	23.0	9.4	4.6	107	-60
102	10050	P	4	41.0	11.3	9.4	90	-50
102	10050	Q	4	47.8	10.8	12.8	83	-44
102	10050	R	1	12.8	12.7	1.1	92	-47
102	10050	S	1	14.7	12.7	1.4	92	-47
102	10050	T	0	4.8	4.5	0.8	97	-33
102	10050	U	1	16.6	14.3	1.5	83	-39
102	10050	V	1	19.2	15.8	1.7	83	-40
102	10050	W	1	18.1	15.0	1.6	86	-43
102	10050	X	1	14.1	13.7	1.2	83	-39
102	10050	Y	3	51.7	17.8	7.5	71	-35
102	10050	Z	0	6.9	8.5	0.6	84	-33
102	10050	AA	0	8.5	14.3	0.4	70	-31
102	10060	A	0	9.0	10.4	0.8	89	-41
102	10060	B	0	10.8	14.5	0.7	83	-42
102	10060	C	4	46.2	12.9	9.5	82	-44
102	10060	D	1	17.8	16.6	1.4	85	-43
102	10060	E	1	14.9	11.0	1.8	98	-51
102	10060	F	1	17.2	13.4	1.8	93	-49
102	10060	G	1	13.9	12.1	1.4	94	-48
102	10060	H	1	5.8	4.1	1.3	109	-42
102	10060	J	0	4.5	1.0	6.3	132	-46
102	10060	K	2	16.7	7.8	3.5	102	-51
102	10060	M	2	16.6	8.1	3.3	103	-52
102	10060	N	4	27.4	5.6	12.4	100	-53
102	10060	O	4	35.5	7.5	12.8	95	-52

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
102	10060	P	4	29.4	7.8	8.9	99	-54
102	10060	Q	1	11.2	8.1	1.7	120	-66
102	10060	R	4	30.9	7.6	10.0	107	-63
102	10060	S	2	10.2	4.9	2.8	124	-63
102	10060	T	3	20.3	7.7	4.9	101	-51
102	10060	U	5	93.2	18.6	18.1	74	-44
102	10060	V	5	102.2	22.1	16.8	69	-40
102	10060	W	5	71.5	14.0	17.3	66	-32
102	10060	X	5	66.4	13.3	16.4	68	-34
102	10060	Y	4	80.5	24.0	10.3	66	-35
102	10060	Z	4	60.4	15.2	11.8	69	-34
102	10060	AA	3	17.0	4.9	6.8	78	-24
102	10060	AB	3	15.8	4.7	6.3	82	-26
102	10070	A	3	18.3	6.7	5.0	82	-31
102	10070	B	3	40.3	19.4	4.5	65	-27
102	10070	C	3	65.3	26.1	6.6	53	-20
102	10070	D	3	52.6	21.6	6.0	56	-21
102	10070	E	4	49.3	14.5	9.1	66	-28
102	10070	F	4	56.7	14.3	11.6	66	-29
102	10070	G	5	71.0	13.7	17.6	68	-34
102	10070	H	4	84.9	22.4	12.3	59	-27
102	10070	J	4	60.0	15.7	11.2	65	-30
102	10070	K	4	33.7	9.0	9.2	65	-22
102	10070	M	4	39.1	7.6	14.7	71	-30
102	10070	N	5	38.7	7.4	15.0	77	-36
102	10070	O	4	28.5	7.7	8.6	91	-45
102	10070	P	2	15.2	9.6	2.2	101	-52
102	10070	Q	4	23.4	5.4	10.1	112	-63
102	10070	R	0	9.9	10.8	0.9	109	-62
102	10070	S	1	10.8	11.1	1.0	112	-65
102	10070	T	4	32.4	8.6	9.2	95	-52
102	10070	U	2	15.7	8.0	3.0	105	-54
102	10070	V	3	21.3	9.6	4.0	102	-54
102	10070	W	0	8.3	11.4	0.6	96	-51
102	10070	X	2	7.6	3.1	3.2	121	-52
102	10070	Y	0	6.9	6.7	0.9	96	-40
102	10070	Z	0	7.2	9.7	0.6	86	-38
102	10070	AA	0	3.4	13.1	0.0	81	-49
102	10070	AB	0	8.7	14.7	0.4	90	-51
102	10070	AC	1	28.8	25.6	1.8	86	-50
102	10070	AD	2	25.0	17.0	2.4	92	-51
102	10070	AE	1	14.4	14.6	1.1	95	-52
102	10070	AF	2	19.8	11.6	2.7	93	-47
102	10080	A	0	2.2	6.8	0.0	88	-44

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
102	10080	B	0	10.7	15.3	0.6	85	-45
102	10080	C	0	9.9	11.8	0.8	92	-46
102	10080	D	2	24.0	15.3	2.6	96	-54
102	10080	E	1	15.8	14.5	1.4	98	-55
102	10080	F	0	8.6	10.6	0.7	101	-54
102	10080	G	2	21.0	14.9	2.1	99	-56
102	10080	H	1	23.1	20.7	1.6	90	-52
102	10080	J	0	7.6	14.2	0.3	87	-49
102	10080	K	0	3.1	11.2	0.0	82	-47
102	10080	M	0	2.3	9.3	0.0	79	-43
102	10080	N	0	10.1	14.5	0.6	75	-34
102	10080	O	1	11.9	11.8	1.1	79	-33
102	10080	P	0	5.3	1.5	4.8	135	-54
102	10080	Q	2	13.3	6.8	2.9	110	-55
102	10080	R	3	17.5	7.0	4.4	106	-55
102	10080	S	3	30.2	10.3	6.4	95	-51
102	10080	T	3	38.3	12.8	7.1	90	-50
102	10080	U	3	33.7	11.6	6.6	94	-52
102	10080	V	0	9.0	11.5	0.7	109	-64
102	10080	W	0	8.4	12.7	0.5	103	-61
102	10080	X	2	14.8	8.9	2.4	107	-56
102	10080	Y	3	16.0	6.7	4.0	110	-58
102	10080	Z	2	14.3	8.7	2.3	107	-56
102	10080	AA	2	13.7	8.3	2.3	103	-51
102	10080	AB	3	28.5	10.9	5.4	97	-53
102	10080	AC	4	40.9	9.1	12.4	85	-44
102	10080	AD	3	20.5	8.9	4.1	71	-22
102	10080	AE	4	37.4	9.7	9.9	78	-36
102	10080	AF	4	63.1	14.3	13.8	68	-33
102	10080	AG	5	68.8	14.4	15.7	68	-33
102	10080	AH	4	42.4	11.5	9.7	76	-36
102	10080	AJ	3	25.4	8.1	6.7	75	-28
102	10080	AK	3	22.7	7.9	5.7	84	-36
102	10090	A	3	16.3	5.1	6.0	88	-33
102	10090	B	3	15.5	5.0	5.6	87	-32
102	10090	C	2	14.5	9.6	2.1	72	-22
102	10090	D	4	39.5	8.5	12.9	77	-35
102	10090	E	5	66.3	13.7	15.8	68	-34
102	10090	F	4	54.2	17.0	8.6	69	-33
102	10090	G	4	23.5	4.1	14.7	78	-29
102	10090	H	4	26.4	7.3	8.2	85	-39
102	10090	J	3	18.3	7.0	4.7	100	-49
102	10090	K	2	13.9	6.6	3.2	108	-54
102	10090	M	2	17.0	10.5	2.4	105	-57

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
102	10090	N	3	31.9	11.9	5.8	97	-54
102	10090	O	3	41.4	13.3	7.7	88	-49
102	10090	P	3	32.2	11.5	6.2	87	-44
102	10090	Q	3	29.6	9.0	7.5	94	-49
102	10090	R	4	33.3	9.7	8.2	94	-51
102	10090	S	3	9.5	3.0	5.0	114	-48
102	10090	T	2	13.3	6.9	2.8	91	-37
102	10090	U	0	9.8	12.0	0.7	79	-34
102	10090	V	0	5.5	12.9	0.2	65	-27
102	10090	W	0	3.3	12.9	0.0	62	-29
102	10090	X	1	24.9	23.9	1.5	79	-42
102	10090	Y	1	28.7	27.2	1.6	78	-43
102	10090	Z	0	18.0	25.7	0.8	84	-50
102	10090	AA	1	19.4	21.1	1.2	83	-46
102	10090	AB	1	23.0	25.5	1.2	83	-48
102	10090	AC	2	30.8	16.9	3.4	89	-49
102	10090	AD	0	10.3	12.3	0.8	94	-49
102	10090	AE	0	12.8	19.4	0.6	80	-44
102	10100	A	0	9.3	14.8	0.5	82	-43
102	10100	B	0	8.4	12.1	0.5	90	-47
102	10100	C	2	24.1	18.6	2.0	83	-44
102	10100	D	1	23.8	29.2	1.1	78	-45
102	10100	E	1	15.4	13.8	1.4	87	-43
102	10100	F	1	13.3	10.3	1.6	93	-44
102	10100	G	1	14.5	11.9	1.5	84	-37
102	10100	H	1	12.5	10.5	1.4	83	-35
102	10100	J	0	3.3	10.2	0.1	59	-21
102	10100	K	2	7.1	4.0	2.0	104	-37
102	10100	M	2	10.9	4.7	3.4	110	-50
102	10100	N	1	17.3	12.5	1.9	95	-49
102	10100	O	3	35.2	15.3	4.9	89	-49
102	10100	P	4	45.0	13.0	9.1	88	-49
102	10100	Q	4	39.8	10.8	9.5	89	-48
102	10100	R	4	34.8	10.2	8.2	91	-48
102	10100	S	2	16.1	8.9	2.7	106	-56
102	10100	T	2	14.5	9.8	2.0	106	-56
102	10100	U	0	6.3	10.9	0.4	94	-51
102	10100	V	1	7.8	6.2	1.3	111	-53
102	10100	W	2	11.5	4.5	3.9	112	-52
102	10100	X	3	13.7	3.7	6.9	108	-50
102	10100	Y	4	17.1	4.3	8.2	101	-47
102	10100	Z	3	25.8	8.2	6.7	85	-39
102	10100	AA	4	30.5	7.1	10.8	79	-34
102	10100	AB	5	27.1	4.1	18.5	82	-34

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
102	10100	AC	5	22.9	3.5	17.4	88	-37
202	10110	A	4	38.1	9.5	10.5	59	-18
202	10110	B	4	37.2	10.9	8.4	57	-16
202	10110	C	3	22.0	6.6	6.9	70	-21
202	10110	D	3	14.6	5.2	4.8	53	2
202	10110	E	3	14.7	4.5	6.0	62	-5
202	10110	F	4	17.3	4.2	8.6	85	-31
202	10110	G	3	21.0	7.3	5.6	88	-39
202	10110	H	1	6.9	4.8	1.5	113	-49
202	10110	J	1	9.2	7.2	1.4	97	-42
202	10110	K	2	15.5	10.0	2.2	98	-48
202	10110	M	2	15.2	8.3	2.7	100	-48
202	10110	N	3	30.5	10.3	6.5	89	-45
202	10110	O	4	49.1	14.6	8.9	77	-40
202	10110	P	4	59.5	18.6	8.9	73	-38
202	10110	Q	2	17.2	12.1	2.0	86	-40
202	10110	R	1	10.5	8.8	1.3	92	-41
202	10110	S	3	12.1	4.5	4.3	100	-40
202	10110	T	1	9.3	7.9	1.2	82	-28
202	10110	U	0	4.6	12.1	0.1	53	-15
202	10110	V	1	14.9	15.4	1.1	58	-16
202	10110	W	1	17.6	17.2	1.3	55	-14
202	10110	X	2	32.1	17.3	3.6	60	-20
202	10110	Y	2	19.4	12.7	2.3	147	-102
202	10110	Z	0	11.9	13.9	0.9	208	-165
202	10110	AA	0	8.5	20.0	0.3	70	-38
202	10110	AB	0	7.8	17.9	0.2	69	-35
202	10110	AC	0	2.9	11.0	0.0	63	-28
202	10120	A	0	2.3	3.2	0.3	92	-23
202	10120	B	0	8.9	11.5	0.7	72	-27
202	10120	C	1	16.3	19.2	1.0	57	-19
202	10120	D	2	29.9	19.3	2.7	62	-22
202	10120	E	2	33.3	20.3	3.1	60	-22
202	10120	F	1	17.8	17.3	1.3	51	-11
202	10120	G	0	4.8	9.5	0.2	54	-10
202	10120	H	0	2.8	8.1	0.1	56	-14
202	10120	J	3	12.1	3.7	5.6	102	-41
202	10120	K	3	19.4	6.3	6.0	90	-39
202	10120	M	3	35.6	17.6	4.1	86	-47
202	10120	N	2	25.9	15.6	2.9	92	-50
202	10120	O	1	15.0	13.1	1.4	94	-49
202	10120	P	1	16.7	14.3	1.5	87	-43
202	10120	Q	2	23.8	11.1	3.9	83	-38

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
202	10120	R	3	21.1	8.0	5.0	89	-40
202	10120	S	3	21.4	6.9	6.2	89	-40
202	10120	T	3	20.4	6.3	6.5	87	-37
202	10120	U	3	21.7	8.0	5.2	79	-31
202	10120	V	3	15.6	5.7	4.8	70	-16
202	10120	W	0	4.1	11.6	0.1	30	6
202	10120	X	2	10.5	6.4	2.1	74	-17
202	10120	Y	2	11.7	6.6	2.4	69	-13
202	10120	Z	0	7.6	0.8	21.1	102	-27
202	10130	A	0	3.4	0.0	97.9	129	-29
202	10130	B	0	6.6	0.0	290.4	103	-22
202	10130	C	2	8.6	4.4	2.4	80	-17
202	10130	D	2	7.8	3.9	2.4	81	-15
202	10130	E	0	8.2	1.6	9.2	78	-7
202	10130	F	2	6.2	2.4	3.2	115	-41
202	10130	G	4	25.0	6.1	9.5	87	-40
202	10130	H	3	23.3	10.1	4.3	84	-38
202	10130	J	1	10.6	11.0	1.0	94	-47
202	10130	K	2	18.8	12.0	2.4	91	-44
202	10130	M	3	32.8	13.9	4.9	87	-46
202	10130	N	1	17.3	12.8	1.9	86	-41
202	10130	O	4	37.5	9.1	10.8	78	-36
202	10130	P	4	35.1	7.9	11.7	77	-34
202	10130	Q	3	21.2	6.6	6.5	85	-35
202	10130	R	0	2.4	4.3	0.2	72	-12
202	10130	S	0	2.8	5.0	0.2	69	-13
202	10130	T	1	15.6	14.0	1.4	54	-10
202	10130	U	2	32.7	21.7	2.7	44	-6
202	10130	V	2	26.0	16.3	2.7	54	-13
202	10130	W	0	8.0	10.3	0.6	63	-16
202	10130	X	0	8.5	11.9	0.6	68	-24
202	10130	Y	0	5.3	11.4	0.2	65	-25
202	10140	A	0	4.8	8.9	0.3	77	-31
202	10140	B	0	8.8	12.2	0.6	71	-27
202	10140	C	0	9.6	18.4	0.4	55	-19
202	10140	D	1	16.9	16.5	1.3	56	-15
202	10140	E	2	23.2	15.7	2.4	52	-10
202	10140	F	1	11.9	10.4	1.3	63	-14
202	10140	G	3	13.8	4.5	5.4	98	-40
202	10140	H	4	29.1	7.2	9.8	87	-42
202	10140	J	3	22.6	10.2	4.0	88	-41
202	10140	K	1	17.7	18.5	1.2	77	-37
202	10140	M	1	17.4	14.8	1.6	80	-37

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
202	10140	N	1	18.3	13.9	1.9	82	-38
202	10140	O	0	7.2	12.3	0.4	76	-34
202	10140	P	0	5.1	10.7	0.2	74	-33
202	10140	Q	1	15.9	11.8	1.8	90	-44
202	10140	R	2	19.7	13.5	2.2	82	-38
202	10140	S	2	23.4	14.5	2.7	80	-37
202	10140	T	3	16.2	5.9	4.8	94	-41
202	10140	U	2	8.3	3.6	3.0	83	-17
202	10140	V	1	15.0	10.5	1.9	71	-23
202	10140	W	2	16.6	11.7	2.0	66	-19
202	10140	X	0	16.8	1.9	24.0	85	-28
202	10150	A	6	50.9	3.9	55.4	63	-24
202	10150	B	6	59.7	4.1	67.1	59	-22
202	10150	C	1	10.7	10.3	1.1	70	-22
202	10150	D	0	3.0	8.7	0.1	71	-31
202	10150	E	1	6.6	4.3	1.6	72	-6
202	10150	F	2	13.8	6.1	3.5	89	-33
202	10150	G	2	14.5	7.2	3.1	89	-36
202	10150	H	0	11.8	13.4	0.9	81	-38
202	10150	J	0	2.8	8.5	0.1	82	-41
202	10150	K	0	8.6	13.7	0.5	74	-33
202	10150	M	1	11.9	10.6	1.3	88	-39
202	10150	N	1	14.7	11.4	1.7	85	-38
202	10150	O	0	11.1	15.3	0.7	78	-38
202	10150	P	3	29.5	12.5	4.8	81	-38
202	10150	Q	3	31.7	10.1	7.2	84	-41
202	10150	R	4	35.3	9.7	9.0	84	-41
202	10150	S	2	23.9	11.8	3.6	85	-40
202	10150	T	0	1.1	5.9	0.0	48	-9
202	10150	U	0	4.7	8.8	0.3	59	-13
202	10150	V	1	12.5	11.6	1.2	63	-16
202	10150	W	2	20.9	10.3	3.5	70	-22
202	10150	X	0	6.9	15.3	0.2	62	-26
202	10150	Y	0	7.3	11.4	0.4	72	-29
202	10160	A	0	6.0	6.4	0.7	77	-20
202	10160	B	0	6.2	13.7	0.2	59	-21
202	10160	C	0	5.9	12.4	0.2	61	-22
202	10160	D	2	24.3	12.5	3.5	53	-8
202	10160	E	0	5.2	8.0	0.4	55	-5
202	10160	F	1	14.7	10.2	1.9	84	-35
202	10160	G	4	43.8	12.7	8.9	70	-31
202	10160	H	3	34.7	13.6	5.6	63	-22
202	10160	J	1	12.7	11.3	1.3	74	-27

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
202	10160	K	0	4.1	9.4	0.2	71	-29
202	10160	M	0	1.0	4.7	0.0	80	-36
202	10160	N	2	21.3	12.4	2.8	81	-36
202	10160	O	3	39.4	16.5	5.3	66	-28
202	10160	P	0	10.3	11.7	0.8	68	-22
202	10160	Q	0	21.4	1.4	54.2	81	-28
202	10160	R	0	18.4	1.1	58.8	81	-25
202	10171	A	0	23.2	1.2	76.4	75	-24
202	10171	B	1	4.5	2.9	1.4	97	-21
202	10171	C	0	1.2	2.0	0.1	107	-29
202	10171	D	4	12.9	3.0	8.3	76	-15
202	10171	E	3	10.9	3.6	4.9	88	-26
202	10171	F	1	9.7	9.0	1.1	78	-27
202	10171	G	1	11.3	9.0	1.5	80	-29
202	10171	H	3	27.9	12.7	4.3	65	-22
202	10171	J	4	56.6	14.8	11.0	55	-19
202	10171	K	2	21.8	13.7	2.6	70	-26
202	10171	M	2	39.5	22.4	3.6	36	0
202	10171	N	0	8.0	9.2	0.7	67	-17
202	10171	O	0	7.1	9.7	0.5	65	-17
202	10180	A	0	7.1	11.1	0.4	55	-11
202	10180	B	2	23.9	17.5	2.1	28	12
202	10180	C	0	11.0	14.5	0.7	34	6
202	10180	D	2	29.1	17.0	3.1	63	-22
202	10180	E	3	48.8	18.1	6.7	56	-19
202	10180	F	4	36.0	10.5	8.4	65	-23
202	10180	G	0	7.4	10.3	0.5	67	-21
202	10180	H	0	7.7	8.1	0.8	72	-20
202	10180	J	0	2.5	3.2	0.4	87	-17
202	10180	K	3	42.5	13.6	7.8	53	-14
202	10180	M	3	47.0	16.7	7.0	39	-2
202	10180	N	0	14.9	1.8	21.2	85	-26
202	10180	O	0	17.3	1.5	34.8	83	-26
202	10190	A	0	3.3	1.0	3.7	125	-30
202	10190	B	2	10.0	4.7	2.9	79	-18
202	10190	C	3	10.1	3.2	5.0	83	-19
202	10190	D	2	11.3	7.0	2.1	81	-26
202	10190	E	0	4.6	7.3	0.3	68	-17
202	10190	F	1	14.7	12.7	1.4	62	-16
202	10190	G	3	44.9	17.1	6.3	35	2
202	10190	H	4	50.7	15.3	8.8	36	0
202	10190	J	4	50.2	15.5	8.6	38	-1

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
202	10190	K	2	26.0	17.7	2.4	50	-9
202	10190	M	0	5.3	7.1	0.5	69	-16
202	10190	N	3	36.0	12.1	6.9	66	-25
202	10190	O	3	52.6	17.9	7.6	59	-23
202	10190	P	1	15.1	15.7	1.1	37	3
202	10190	Q	0	6.4	13.8	0.2	42	-5
202	10190	R	0	6.4	13.4	0.3	45	-6
202	10200	A	0	2.0	2.2	0.4	95	-13
202	10200	B	0	5.5	8.8	0.4	46	0
202	10200	C	0	7.0	13.8	0.3	30	7
202	10200	D	0	7.5	11.3	0.5	31	12
202	10200	E	0	6.0	11.3	0.3	38	3
202	10200	F	0	5.4	10.2	0.3	43	0
202	10200	G	0	3.0	2.8	0.6	82	-6
202	10200	H	0	3.5	-0.8	0.0	28	-28
202	10200	J	3	54.8	20.4	6.9	54	-19
202	10200	K	3	54.6	21.9	6.2	53	-19
202	10200	M	0	10.1	14.5	0.6	52	-12
202	10200	N	0	8.4	12.5	0.5	54	-12
202	10200	O	0	2.6	5.1	0.2	74	-20
202	10200	P	2	42.9	28.3	3.0	44	-9
202	10200	Q	3	72.2	31.2	6.1	30	1
202	10200	R	4	116.4	45.3	8.1	23	3
202	10200	S	3	119.3	47.9	7.8	20	5
202	10200	T	3	78.3	37.3	5.6	24	5
202	10200	U	1	16.4	14.0	1.5	57	-13
202	10200	V	0	4.4	8.2	0.3	69	-22
202	10200	W	0	2.1	3.9	0.2	82	-22
202	10200	X	0	4.1	1.0	5.4	111	-22
202	10200	Y	2	7.6	3.0	3.4	87	-18
202	10200	Z	2	6.5	2.6	3.1	91	-19
3	10211	A	2	46.1	25.6	3.9	18	16
3	10211	B	3	46.3	21.3	4.9	2	33
3	10211	C	2	37.6	22.6	3.3	3	33
3	10211	D	0	11.2	27.9	0.3	25	2
3	10211	E	0	6.8	17.7	0.2	15	16
3	10211	F	2	30.7	16.1	3.6	31	9
3	10211	G	2	38.3	20.9	3.7	30	6
3	10211	H	0	5.2	0.8	11.2	88	-4
3	10211	J	0	6.9	15.3	0.2	8	27
3	10211	K	0	6.3	18.1	0.1	0	54
3	10211	M	0	5.0	8.3	0.3	6	41
3	10211	N	0	2.6	3.4	0.3	39	28

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
3	10221	A	0	5.7	14.3	0.2	6	28
3	10221	B	2	37.5	23.6	3.1	23	12
3	10221	C	0	6.6	19.1	0.1	2	28
3	10221	D	0	6.6	17.4	0.2	5	27
3	10221	E	0	16.5	28.5	0.6	0	30
3	10221	F	1	28.9	35.3	1.2	0	33
3	10221	G	1	49.1	56.5	1.5	0	47
3	10221	H	2	65.5	51.5	2.7	0	49
3	10221	J	3	78.9	43.5	4.6	0	51
3	10221	K	3	58.3	31.7	4.3	0	44
3	10221	M	1	18.2	21.5	1.0	15	20
3	10221	N	0	15.2	22.6	0.7	11	23
3	10221	O	0	3.2	1.2	2.7	88	4
3	10230	A	3	14.9	4.8	5.6	73	-17
3	10230	B	3	14.6	4.9	5.2	74	-18
3	10230	C	1	6.9	6.3	1.0	68	-11
3	10230	D	0	6.5	8.1	0.6	64	-12
3	10230	E	0	6.4	9.7	0.4	62	-16
3	10230	F	0	6.9	10.9	0.4	59	-15
3	10230	G	2	38.1	25.1	2.9	32	2
3	10230	H	2	47.6	35.8	2.6	23	8
3	10230	J	2	44.2	29.7	3.0	23	9
3	10230	K	3	43.8	20.4	4.8	28	8
3	10230	M	3	49.1	20.7	5.6	24	11
3	10230	N	0	8.6	13.7	0.5	42	-1
3	10230	O	1	12.8	10.5	1.5	54	-5
3	10230	P	2	18.8	11.1	2.6	53	-6
3	10230	Q	0	6.9	15.5	0.2	26	9
3	10241	A	0	4.3	8.0	0.3	43	3
3	10241	B	0	8.6	12.0	0.6	51	-7
3	10241	C	2	31.5	22.5	2.4	43	-5
3	10241	D	1	22.0	22.5	1.3	40	-4
3	10241	E	0	13.8	21.1	0.6	31	3
3	10241	F	2	56.2	36.4	3.4	15	16
3	10241	G	2	50.4	28.3	3.9	16	17
3	10241	H	2	46.9	35.2	2.6	16	15
3	10241	J	2	41.2	30.4	2.6	14	19
3	10241	K	1	27.0	24.1	1.7	31	4
3	10241	M	1	25.4	21.2	1.8	38	0
3	10241	N	1	21.2	19.3	1.5	43	-4
3	10241	O	0	4.0	8.3	0.2	47	-2
3	10241	P	3	13.0	5.2	4.0	68	-11

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
3	10241	Q	4	9.8	2.2	8.0	86	-19
3	10241	R	0	8.8	2.0	7.6	87	-19
3	10250	A	4	21.4	4.1	12.6	63	-12
3	10250	B	5	23.0	2.9	22.7	64	-13
3	10250	C	5	27.6	4.6	16.4	62	-15
3	10250	D	3	8.4	2.1	6.6	76	-7
3	10250	E	2	10.9	4.7	3.4	66	-5
3	10250	F	2	10.1	6.3	2.0	67	-10
3	10250	G	2	22.1	10.7	3.6	52	-6
3	10250	H	4	36.5	9.8	9.4	40	0
3	10250	J	3	29.6	10.4	6.2	44	-1
3	10250	K	1	13.6	9.7	1.8	48	1
3	10250	M	2	11.1	5.8	2.6	74	-16
3	10250	N	0	7.4	12.7	0.4	50	-9
3	10250	O	0	4.4	7.0	0.3	26	24
3	10260	A	2	20.2	14.9	2.0	66	-23
3	10260	B	0	13.3	22.8	0.5	39	-5
3	10260	C	2	41.7	30.6	2.6	40	-6
3	10260	D	3	55.0	28.5	4.5	37	-4
3	10260	E	3	54.2	19.5	7.2	40	-5
3	10260	F	2	27.7	15.0	3.4	54	-12
3	10260	G	2	36.1	27.1	2.4	41	-6
3	10260	H	2	32.0	20.9	2.8	41	-3
3	10260	J	1	17.9	13.9	1.8	52	-8
3	10260	K	2	19.8	10.2	3.2	53	-6
3	10260	M	0	14.4	1.9	18.6	79	-19
3	10260	N	5	17.1	2.7	15.3	72	-16
3	10260	O	5	18.2	2.2	22.5	70	-15
402	10270	A	0	3.4	1.5	2.1	96	-7
402	10270	B	3	23.6	6.8	7.5	58	-10
402	10270	C	5	29.4	4.4	19.3	59	-12
402	10270	D	6	28.9	2.8	34.5	61	-14
402	10270	E	5	28.9	3.4	26.5	60	-12
402	10270	F	3	26.9	11.1	4.8	45	0
402	10270	G	2	20.8	9.4	3.9	53	-5
402	10270	H	2	24.5	12.5	3.5	48	-3
402	10270	J	4	60.9	17.5	10.0	28	6
402	10270	K	3	40.6	14.5	6.6	32	6
402	10270	M	2	25.7	14.2	3.2	36	6
402	10270	N	2	10.3	4.8	3.0	80	-19
402	10270	O	1	7.6	5.3	1.5	112	-51
402	10280	A	1	7.6	6.1	1.2	92	-33

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
402	10280	B	0	11.2	20.0	0.4	59	-24
402	10280	C	2	31.7	26.7	2.0	60	-25
402	10280	D	2	50.1	31.0	3.4	57	-24
402	10280	E	0	5.4	20.4	0.1	43	-15
402	10280	F	3	116.9	70.2	4.7	33	-8
402	10280	G	3	84.6	53.2	4.0	33	-5
402	10280	H	3	76.9	42.8	4.5	34	-5
402	10280	J	3	37.6	18.3	4.3	44	-5
402	10280	K	1	16.1	12.1	1.8	54	-8
402	10280	M	2	19.7	12.4	2.5	50	-5
402	10280	N	4	27.8	6.9	9.6	46	0
402	10280	O	4	23.3	6.2	8.3	44	4
402	10280	P	3	21.1	7.0	6.0	53	-4
402	10280	Q	5	41.1	7.7	15.7	52	-11
402	10280	R	5	38.2	5.7	20.8	56	-13
402	10280	S	2	19.7	11.9	2.6	63	-17
402	10280	T	2	15.2	8.7	2.6	66	-15
402	10290	A	2	12.6	6.3	2.9	65	-9
402	10290	B	2	20.9	9.5	3.9	61	-13
402	10290	C	5	38.1	7.1	15.4	55	-13
402	10290	D	5	44.5	6.8	21.0	49	-9
402	10290	E	5	38.5	7.0	16.0	51	-9
402	10290	F	4	33.2	9.2	8.7	51	-8
402	10290	G	3	32.9	10.8	7.0	47	-5
402	10290	H	4	34.1	8.0	11.0	36	6
402	10290	J	3	31.1	9.4	7.6	37	6
402	10290	K	2	31.8	16.8	3.7	32	7
402	10290	M	2	35.7	21.5	3.2	30	6
402	10290	N	1	6.0	5.3	1.0	89	-28
402	10300	A	0	3.2	1.5	1.9	158	-68
402	10300	B	0	10.2	12.4	0.8	75	-31
402	10300	C	0	11.6	14.8	0.7	72	-30
402	10300	D	0	3.8	9.2	0.1	72	-29
402	10301	A	2	30.1	24.2	2.1	40	-3
402	10301	B	1	23.2	20.8	1.6	38	0
402	10301	C	3	23.2	10.0	4.3	49	-3
402	10301	D	4	42.0	11.9	9.1	41	-2
402	10301	E	4	73.4	20.7	10.8	40	-7
402	10301	F	4	75.6	24.4	9.1	41	-9
402	10301	G	5	83.5	12.7	25.2	44	-11
402	10301	H	5	94.8	18.0	19.5	43	-12
402	10301	J	5	75.9	16.6	15.2	43	-10

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FLIGHT	LINE	ANOMALY	CATEGORY	AMPLITUDE (PPM) INPHASE	QUAD.	CONDUCTOR CTP MHOS	DEPTH MTRS	BIRD HEIGHT MTRS
402	10301	K	3	33.0	12.5	5.8	58	-16
402	10301	M	4	34.4	8.2	10.8	61	-18
402	10301	N	4	33.2	6.7	13.3	62	-18
402	10310	A	2	13.8	8.6	2.2	69	-18
402	10310	B	3	42.5	22.3	4.0	62	-26
402	10310	C	3	51.3	27.5	4.2	57	-23
402	10310	D	3	68.0	31.9	5.4	54	-22
402	10310	E	3	63.1	29.2	5.4	52	-20
402	10310	F	2	34.3	25.9	2.3	54	-19
402	10310	G	2	11.7	7.1	2.1	77	-22
402	10310	H	2	7.9	3.4	3.0	96	-29
402	10320	A	2	6.0	2.9	2.3	94	-22
402	10320	B	0	8.3	11.5	0.6	74	-29
402	10320	C	0	10.6	14.1	0.7	70	-28
402	10320	D	1	13.0	11.2	1.4	80	-33
5	8050	A	4	34.9	10.5	8.0	36	5
5	8050	B	4	63.8	17.0	11.1	24	9
5	8050	C	5	87.8	15.3	21.3	20	10
5	8050	D	5	71.1	11.7	21.7	22	11
5	10330	A	0	5.1	9.8	0.3	57	-13
5	10330	B	0	3.3	9.6	0.1	48	-9
5	10330	C	0	8.3	11.1	0.6	43	2
5	10330	D	2	6.7	2.8	3.0	73	-1
5	10330	E	0	2.2	3.8	0.2	60	1
5	10340	A	0	1.0	8.8	0.0	27	1
5	10340	B	0	2.3	12.6	0.0	18	10
5	10340	C	0	8.2	10.8	0.6	50	-4
5	10350	A	0	4.4	6.7	0.4	75	-23
5	10360	A	0	4.9	9.5	0.3	69	-25
5	10360	B	0	4.8	6.2	0.5	75	-19
5	10360	C	0	3.0	4.5	0.3	88	-28
5	10370	A	0	1.5	3.1	0.1	96	-32
5	10370	B	0	2.7	8.4	0.1	58	-18

Estimated depth may be unreliable because the stronger part of the conductor may be deeper or to one side of the flight line, or because of a shallow dip or overburden effects.

APPENDIX III

CERTIFICATE OF QUALIFICATION

I, Roderick W. Woolham of the town of Pickering, Province of Ontario, do hereby certify that:-

1. I am a geophysicist and reside at 1463 Fieldlight Blvd., Pickering, Ontario, L1V 2S3

2. I graduated from the University of Toronto in 1961 with a degree of Bachelor of Applied Science, Engineering Physics, Geophysics Option. I have been practising my profession since graduation.

3. I am a member in good standing of the following organizations: The Association of Professional Engineers of the Province of Ontario (Mining Branch); Society of Exploration Geophysicists; South African Geophysical Association.

4. I have not received, nor do I expect to receive, any interest, directly or indirectly, in the properties or securities of Rio Algom Exploration Inc. or any affiliate.

5. The statements contained in this report and the conclusions reached are based upon evaluation and review of maps and information supplied by Aerodat.

6. I consent to the use of this report in submissions for assessment credits or similar regulatory requirements.

R. W. Woolham, P.Eng.

REGISTERED PROFESSIONAL ENGINEER
R. W. WOOLHAM
PROVINCE OF ONTARIO

Pickering, Ontario

October 24, 1991

APPENDIX IV

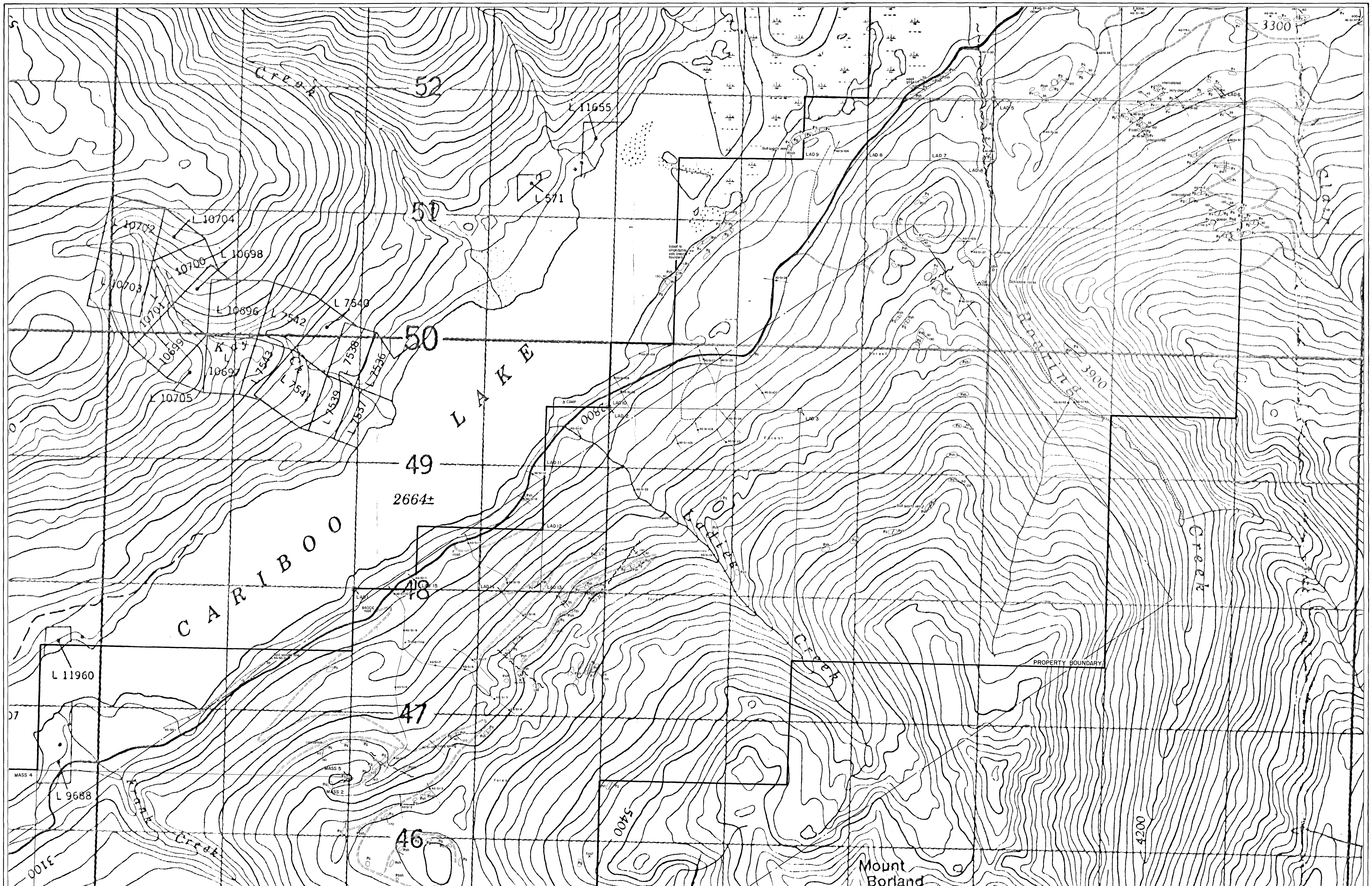
PERSONNEL

FIELD

Flown	Sept. 14 to Sept 17, 1991
Pilot(s)	G. Charbonneau
Operator(s)	S. Arstad

OFFICE

Processing	Doug Oneschuk George McDonald
Report	R. W. Woolham



LEGEND :

Tdi	Mafic dyke, diorite dyke : Recent intrusions
UM	Peridotite : Green and pale green, serpentinized and talcose. Orange brown weathering where calcaeous. Siderite and limonite alteration. Local fuchsite and minor disseminated magnetite and pyrite.
Ɍsh	Schist, phyllite : Light & dark green, quartz-chlorite-sericite. Lesser schistose chloritic masses
Ɍbsh	Black schist : Argillaceous, variably graphitic
Ɍg	Grit, siltstone, mudstone, greywacke : Grey to olive green, dull brownish. Occasionally calcaeous. Usually schistose or fissile.
Ɍq	Quartzite : White to buff tan, light & dark grey to black. Includes minor granule quartzite conglomerate, micaceous quartzite, calcaeous quartzite & feldspathic quartzite. Generally very thick bedded.
Ɍm	Marble : Light buff tan to light grey. Brown weathering pelitic marble.
Ɍv	Tuff, volcanic schist, meta andesite : Light green andesitic tuff & tuffaceous phyllite. Medium green volcanic schist with random metacrysts. Minor green meta andesite.

Outcrop
Geological contact
Fault
130/25 Bedding attitude
25 Schistosity
Fold axis orientation
AG-SI-11 Stream sediment sample location & Nº.
X AG-YR-1 Rock sample location & Nº.

Accessible road
Overgrown road or trail
Stream
Claim post
Area flown (airborne geophysics)

N

N.T.S. 93A - 14
SCALE 1:10,000
200 100 0 200 400 600 800 Metres

Rio Algom Exploration Inc.

MASS CLAIMS

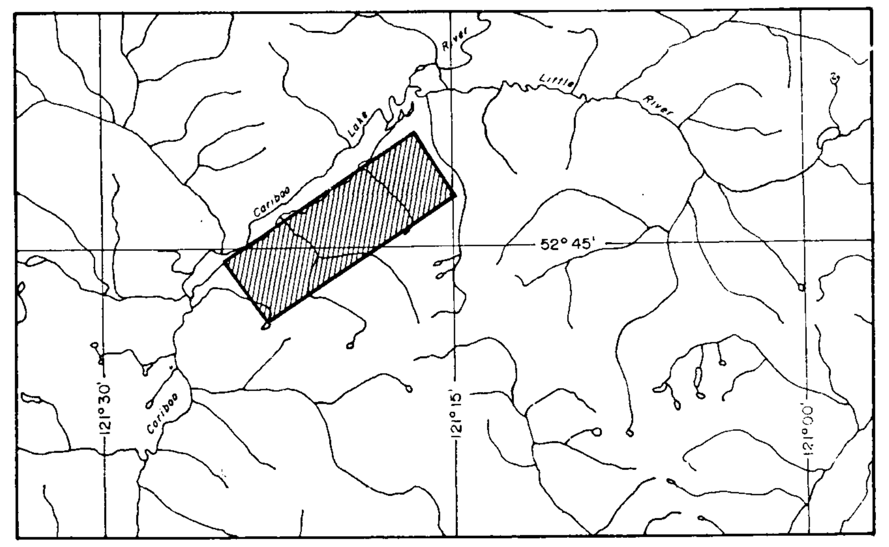
GEOLOGY

CARIBOO M.D., B.C.

DATE	DRAWN BY	DWG.
OCT. 1991	J.A.M. / Chong	Mlr 2

GEOLOGICAL BRANCH
ASSESSMENT REPORT

21,930



GEOLOGICAL BRANCH
ASSESSMENT REPORT

21,930

RIO ALGOM EXPLORATION INC.

BASE MAP

MASS CLAIMS

Likely, B.C.

SCALE 1:10,000

AERODAT LIMITED

DATE: SEPT. 1991

NTS No: 93A/11,14

MAP No: X 4 J9163

Flight Path

Flight path recovery from VHS video tape.

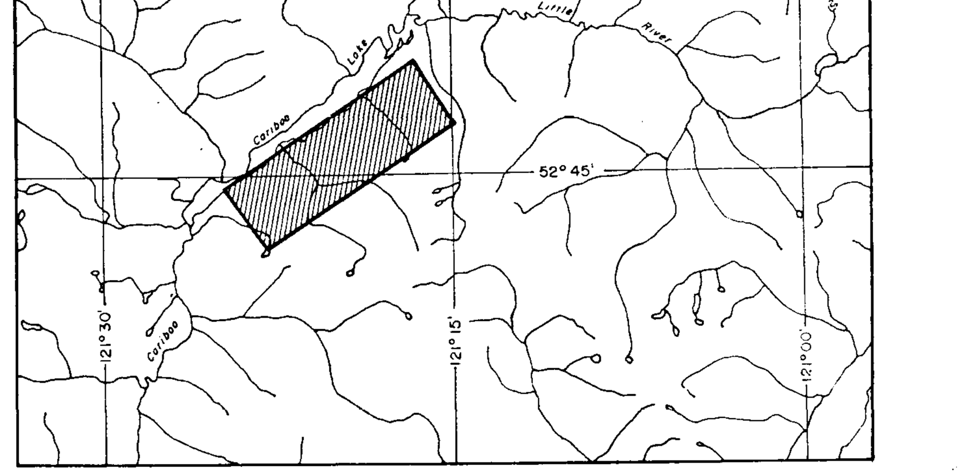
Average terrain clearance 60m
Average line spacing 100m

EM Anomalies

Conductivity Thickness (mhos)

- 0 - 1
- 1 - 2
- 2 - 4
- 4 - 8
- 8 - 15
- 15 - 30
- > 30

EM Anomaly A, 4600 Hz inphase amplitude 7 ppm. Conductivity thickness 1-2 mhos (see code).



RIO ALGOM EXPLORATION INC.

FLIGHT PATH

MASS CLAIMS

Likely, B.C.

SCALE 1:10,000

0 330 660 1320 2640 Feet

0 100 200 500 1000 Metres

AERODAT LIMITED

DATE:	SEPT. 1991
NTS No:	93A/11,14
MAP No:	25 J9163

21,930

Flight Path

Flight path recovery from VHS video tape.

Average terrain clearance 60m
Average line spacing 100m

EM Anomalies

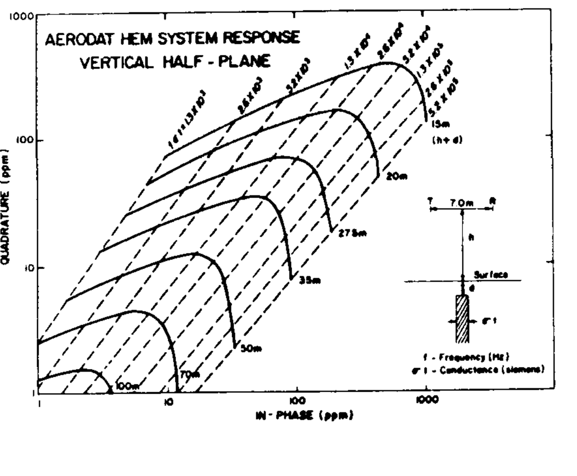
Conductivity Thickness (mhos)

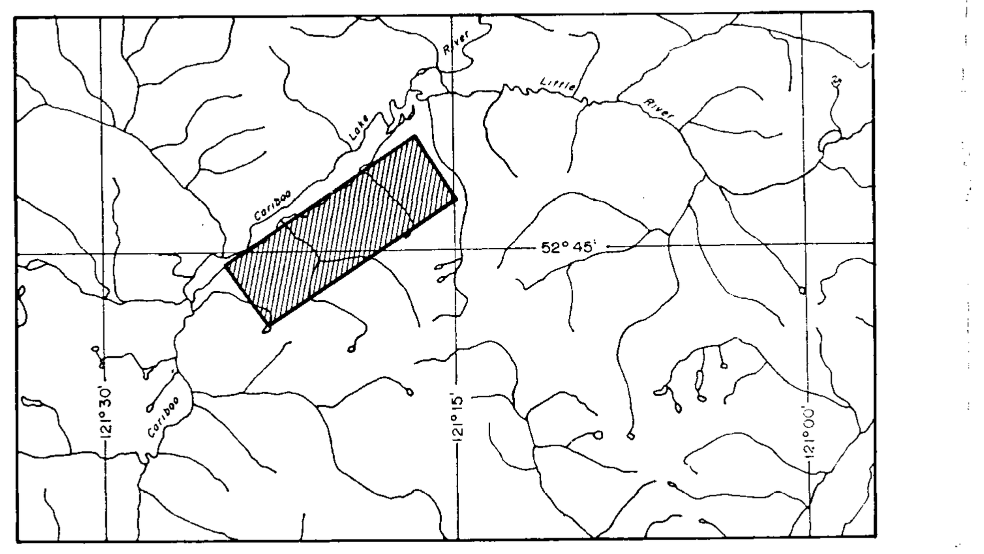
- 0 - 1
- 1 - 2
- 2 - 4
- 4 - 8
- 8 - 15
- 15 - 30
- > 30

EM Anomaly A, 4600 Hz inphase amplitude 7 ppm. Conductivity thickness 1-2 mhos (see code).

INTERPRETATION LEGEND

- Interpreted Conductive Trend
- Magnetic Trend Associated with Conductors
- Fold/Fault Structure
- D Area Recommanded for Further Exploration





RIO ALGOM EXPLORATION INC.

INTERPRETATION

MASS CLAIMS

Likely, B.C.

SCALE 1:10,000

0 330 660 1320 2640 Feet

0 100 200 500 1000 Metres

AERODAT LIMITED

DATE:	SEPT. 1991
NTS No:	93A/11,14
MAP No:	~~8~~ 6 J9163

21,930

GEOLOGICAL BRANCH
ASSESSMENT REPORT

N

Flight Path

Flight path recovery from VHS video tape.

Average terrain clearance 60m
Average line spacing 100m

Magnetics

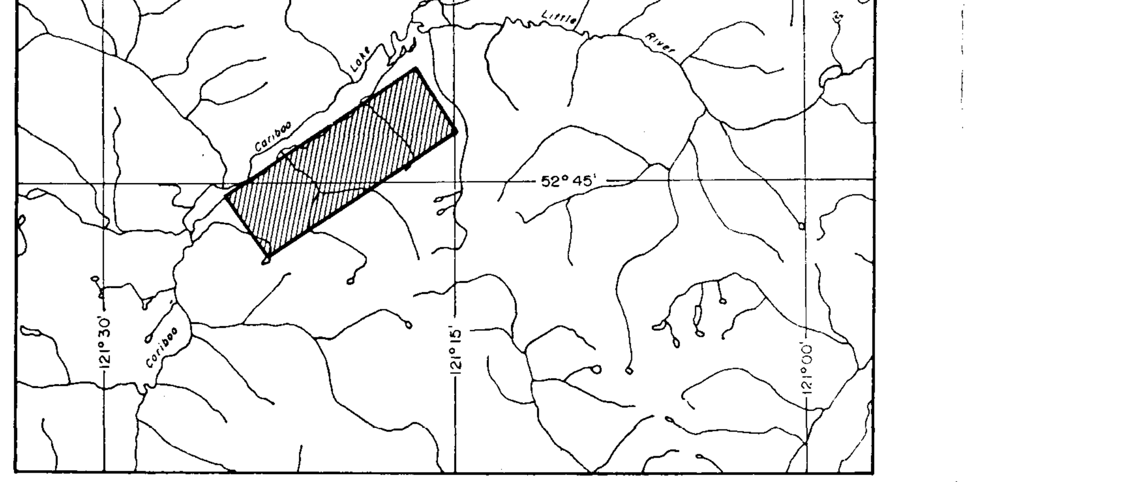
Total Field Magnetic Intensity Contours in nT.

High sensitivity cesium magnetometer.

Sensor elevation 45m

Map contours are multiples of those listed below

2 nT
10 nT
50 nT
250 nT
1000 nT



RIO ALGOM EXPLORATION INC.

TOTAL FIELD MAGNETIC CONTOURS

MASS CLAIMS

Likely, B.C.

SCALE 1:10,000

0 330 660 1320 2640 Feet

0 100 200 500 1000 Metres

AERODAT LIMITED

DATE: SEPT. 1991

NTS No: 93A/11,14

MAP No: A7 J9163

21,930

GEOLOGICAL BRANCH
ASSESSMENT REPORT

Flight Path

Flight path recovery from VHS video tape.

Average terrain clearance 60m
Average line spacing 100m

Vertical Gradient

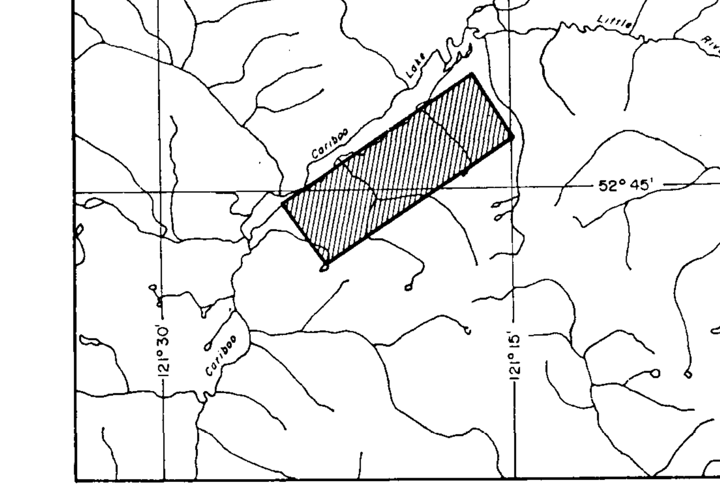
Vertical Magnetic Gradient calculated from the total field magnetic intensity in nT/m.

Cesium high sensitivity magnetometer.

Sensor elevation 45m

Map contours are multiples of those listed below

0.1 nT/m
0.5 nT/m
2.0 nT/m
10 nT/m
50 nT/m



RIO ALGOM EXPLORATION INC.

CALCULATED VERTICAL MAGNETIC GRADIENT

MASS CLAIMS

Likely, B.C.

SCALE 1:10,000

0 330 660 1320 2640 Feet

0 100 200 500 1000 Metres

AERODAT LIMITED

DATE: SEPT. 199

NTS No: 93A/11,14

MAP No: 8 J9163

21,930

GEOLOGICAL BRANCH
ASSESSMENT REPORT

Flight Path

Flight path recovery from VHS video tape.

Average terrain clearance 60m
Average line spacing 100m

Apparent Resistivity

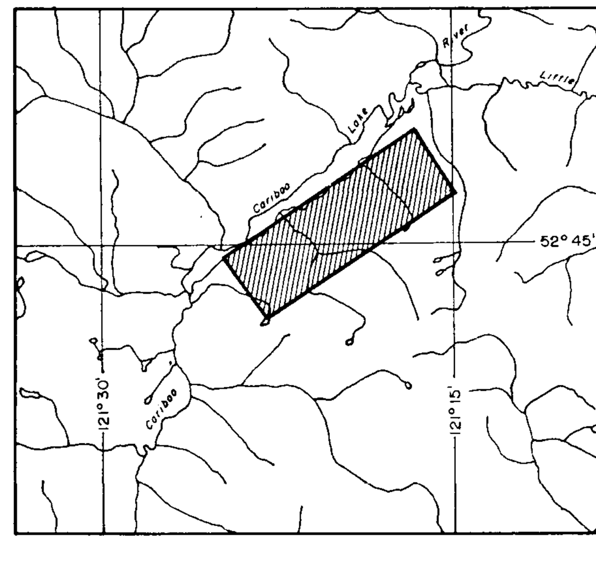
Calculated from 4600 Hz coaxial EM response assuming a 200 m conductive layer.

Contouring in ohm*m at logarithmic intervals.

Sensor elevation 30m

Map contours are multiples of those listed below

0.1 log(ohm*m)
0.5 log(ohm*m)
2.0 log(ohm*m)



RIO ALGOM EXPLORATION INC.

APPARENT RESISTIVITY CONTOURS

MASS CLAIMS

Likely, B.C.

SCALE 1:10,000

0 330 660 1320 2640 Feet

0 100 200 500 1000 Metres

AERODAT LIMITED

DATE:	SEPT. 1991
NTS No:	93A/11,14
MAP No:	89 J9163

N

Flight Path

Flight path recovery from VHS video tape.

Average terrain clearance 60m
Average line spacing 100m

VLF-EM

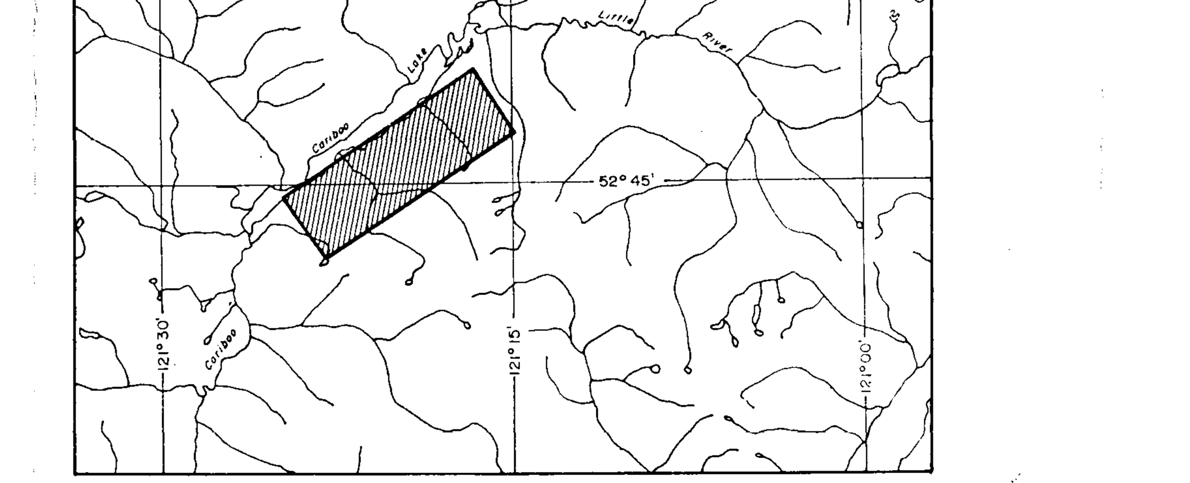
VLF-EM Total Field Intensity in percent.

Station: NPM
Lualualei, Hawaii
23.4 kHz

Sensor elevation 45m

Map contours are multiples of those listed below

1 %
5 %
25 %



RIO ALGOM EXPLORATION INC.

VLF-EM TOTAL FIELD CONTOURS

MASS CLAIMS

Likely, B.C.

SCALE 1:10,000

0 330 660 1320 2640 Feet

0 100 200 500 1000 Metres

AERODAT LIMITED

DATE:	SEPT. 1991
NTS No:	93A/11,14
MAP No:	10 J9163