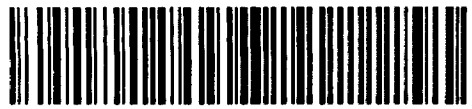

REPORT ON AN AIRBORNE RADIOMETRIC AND MAGNETIC SURVEY OF PART OF PALMERSTON TOWNSHIP, ONTARIO FOR GEOPHYSICAL ENGINEERING LTD.

FLOWN & COMPILED BY
GEOTERREX LIMITED

INTRODUCTION

Geoterrex Ltd. was contracted by Geophysical Engineering to perform an airborne geophysical survey over claims owned or held by Geophysical Engineering in Palmerston Township, County of Frontenac.

The survey utilized four channel spectrometric and magnetic survey equipment owned and operated by Geoterrex and described in Appendix B to this report.

SURVEY PROCEDURES

The survey was conducted by flying parallel lines at one-eighth mile spacing in a direction parallel to the range lines. Approximately 14 line miles of survey was completed over the claims.

The survey was conducted on July 4th and 5th, 1976, using the Geoterrex Otter registration CF-AYR, based at Ottawa.

The cost of the survey was $1,430.00.

DON M. WAGG, P.ENG.

OTTAWA, ONTARIO
OCTOBER 9 1976

geoterrex ltd.

PERSONNEL

The personnel involved in this survey were as follows:

Joe Broeders	Pilot	Manotick, Ontario
Alvin Tolley	Navigator	Maniwaki, Quebec
Bob Innes	Aircraft Mechanic	Kingston, Ontario
Jean Tarin	Electronics Operator	Ottawa, Ontario
Frank Kiss	Data Reductionist	Ottawa, Ontario
Peter Tallyhoe	Compilation Chief	Ottawa, Ontario
Bob Schingh	Drafting Chief	Ottawa, Ontario
Don Wagg	Geophysicist	Ottawa, Ontario
Roman Wasylechko	Geophysicist	Ottawa, Ontario.

The survey was supervised by Don M. Wagg, a registered Professional Engineer in the Province of Ontario, previously accredited by the Ontario Ministry of Natural Resources.

CLAIMS COVERED

The claims covered by this survey were as follows:

Claims No. 430528 to 430539 inclusive	12 claims
430950 and 430951	2 claims
413648 to 413655 inclusive	8 claims
Total	22 claims

RESULTS

Accompanying this report is a plan map on photo-mosaic base at a scale of 1 inch equals 1320 feet, showing the locations of the claims and the flight lines covering the area. Radiometric anomalies have been chosen and listed in Appendix A to this report, and have been plotted on the base map.

Anomalies were chosen and graded on the basis of anomaly amplitude over background, uranium to thorium ratio, and anomaly shape.

Grading used was as follows:

1 - Good amplitude and/or high uranium to thorium ratio

2 - Weak to fair amplitude and/or low uranium to thorium ratio.

A - Good shape - appropriate to finite geometry of source

B - Broad shape and/or poor statistical correlation between channel responses.

Symbols used for the above grades are shown on the plan map.

A magnetic contour map from the survey results over these claims, also at a scale of 1 inch equals 1320 feet, has been prepared and accompanies this report.

GENERAL CONCLUSIONS

Anomalous radioactive anomalies are plentiful in the area, many of which are conformal with country rock strike (namely N to NNE) implying formational occurrence of the radioactive sources. Variations along strike are, no doubt, due to both variation of radioactive content and variation of thickness of shielding cover. In any case the area covered by the claims is sufficiently anomalous to warrant ground investigation at least in those areas where 1-A grade anomalies occur.

Respectfully submitted,

Don M. Wagg

Don M. Wagg, P.Eng.

APPENDIX A

RADIOMETRIC ANOMALY LISTING

GEOPHYSICAL ENGINEERING LTD.

Anom	Fids	Center	Tot	K	UR	Th	Alt	Rate	Remarks
19A	217.65/.85	217.75	950	90	55	-	180	2A	
20A	225.82/ 226.28	225.93 226.15	1040	125	125	.50?	140	1B	Two sources
21A	238.36/.95	238.65	800	100	30	30	180	2B	
22A	244.92/245	244.46	520	60	37	15	150	2A	
B	245.12/.50	245.30	500	60	30	22	145	1B	
C	245.80/ 246.20	246.05	800	95	48	16	148	1B	
D	246.85/ 247.05	246.95	400	55	34	14	146	2A	
23A	260.27/.57	260.42	480	70	20	30	185	2B	
B	259.87/ 260.2	260.05	720	130	38	50	160	2B	
C	259.34/.56	259.45	1040	120	24	26	180	2A	
D	258.82/.97	258.9	800	70	45	10	180	1A	
24A	266.1/.35	266.2	800	100	32	32	230	2A	
B	267.0/.68	267.4	2160	300+	50+	50+	140	1B	Dual
C	268.35/.60	268.50	1760	170	45+	23	150	1A	
25A	281.35/.95	281.5	2400+	300+	60+	42	150	1B	
B	280.95/ 281.2	281.1	560	112	24	20	185	2A	
C	280.35/.75	280.55	1200	145	50+	26	150	1B	
D	279.35/ 280.15	279.75	1840	150	30+	26	180	2B	
26A	294.24/.66	294.4	2000	150	50+	40	140	2A	
B	295.37/ 296.6	295.57 295.90 296.34	1840	190	50+	45	175	2A	3 sources
27A	309.36/.80	309.61	1440	80	70	26	200	2A	
28A	314.78/ 315.08	314.93	500	120	14	15	170	2B	
B	315.29/.87	315.68	1500	150	70+	15	145	1B	Dual

geoterrex ltd.

OTTER RADIOMETRIC SYSTEM - EQUIPMENT AND PROCEDURES

EQUIPMENT

The equipment used in this survey is installed in a DeHavilland DHC-3 Otter aircraft, Canadian registration C-FAYR. It comprises the following units:

A. Exploranium DiGRS-3001, 4-channel digital output spectrometer.

Window settings are:

Total count	- 0.4 to 2.82 Mev.
K-40	- 1.36 to 1.56 Mev (Potassium)
Bi-214	- 1.66 to 1.86 Mev (Uranium)
TL-208	- 2.42 to 2.82 Mev (Thorium)

B. Crystal Detectors - 11 - Harshaw 6"x4" Sodium Iodide plus 1 - 8"x4" crystals, total volume 1444 cubic inches (temperature controlled).

C. Geometrics Model 704 Digital acquisition system with Cipher Model 70 magnetic tape recorder.

D. Geometrics G-803 Proton resonance magnetometer.

E. Gulton TR-888, eight channel hot-pen analogue recorder.

F. Moseley 7100-B Dual 10" analogue recorder

G. Sperry Radar Altimeter Model RT-220

H. Hulcher 35 mm strip film path recovery camera

I. Geoterrex Intervalometer, solid state, controlled by the magnetometer.

EQUIPMENT OPERATION

The system is controlled by a command signal from the proton resonance magnetometer, which synchronizes magnetometer and spectrometer sample times, and fiducial system for identifying digital and analogue recorder and camera times. The usual time used is one second intervals, with fiducial numbers each 20 seconds indicated by a wide fiducial marker on the analogue recorders.

The 4 channels of radiometric data are recorded on the TR-888, along with aircraft altitude and magnetometer results. Analogue scales are chosen as appropriate for the area flown. Commonly these are 0-1000 cps for Total count with a multiplier of 4 - 0-500 cps for Potassium (multiplier 1), 0-100 cps for Uranium (multiplier 1), and 0-100 cps for Thorium (multiplier 1).

Altimeter scale is commonly 100 feet to 400 feet and magnetic scale 0-500 gammas.

The magnetometer results are also recorded on the 10 inch Moseley recorder, usually with scales of 0-500 gammas and 0-5000 gammas.

Digital data is recorded on 7 track magnetic tape in incremental mode at 200 bpi. Scan time is usually one scan per second of 40 characters, with 20 cans per block. Language is ASCII.

Tape format is as follows;

2 characters	manual entry - flight number
3 characters	manual entry - line number or test identification
5 characters	fiducial number (each 20 readings)
5 characters	magnetic value in gammas (total field)
4 characters	altitude in relative numbers
4 characters	total count (c.p.s.)
2 characters	total count multiplier
4 characters	potassium count (c.p.s.)
1 character	potassium multiplier
4 characters	uranium count (c.p.s.)
1 character	uranium multiplier
4 characters	thorium count
1 character	thorium multiplier

Recording of spectrometer results both analogue and digital, is normally made with no Compton scatter correction, although such correction is available on the analogue data if desired.

SURVEY PROCEDURES

Normal speed of the Otter is 100 mph (147 ft/sec) and normal terrain clearance is 150 to 200 feet.

Spectrometer stability is achieved by close temperature control of the enclosed and insulated sodium iodide crystals

and photomultipliers on a 24 hour continuous basis. In addition high voltage supplies are oversized and highly regulated.

Tests for stability are performed daily as follows:

Prior to the first flight each day and after the last flight of the day;

a) Analogue chart zero and full scale positions are checked and adjusted if necessary.

b) System calibration is checked by placing sample sources of uranium and thorium respectively in fixed positions relative to the detectors, as well as recording background count for each channel. Values of uranium count less background and thorium count less background, should remain constant within ±10% to indicate system stability.

c) A test line covering water (if feasible) and outcrop area, flown at survey elevation is established and repeated as accurately as possible. A distance of some 3-4 miles is used. Repeatability of results is an indication of system stability.

d) Radar altimeter checks are made while flying over water, usually at 100 feet and 400 feet.

An in-flight oscilloscope displaying digital values is monitored for verification of digital data being recorded.

DATA TREATMENT

The following presentation of data is available at the discretion of the contracting party;

A. Magnetic - Contour maps at contour intervals and plan scales as desired.

- Magnetic profile maps with scales as desired.

B. Radiometric - For rapid exploration and prospecting purposes anomalies may be picked and plotted on a plan map. These would be chosen and graded manually or by computer according to amplitude over background, curve shape and distribution, and ratio of uranium to thorium.

For more complete compilation used in mapping and thorough areal assessment, machine treatment of data is desirable.

In this case raw data is corrected for background, aircraft altitude and Compton scatter according to practises set out by the Canadian Government (Department of Energy, Mines and Resources). Corrected data is then used for any of the following:

- Contour maps of any of the spectrometer channel results or ratios of any two channels.
- Profile maps of any of the channels or ratios.
- Stacked profiles of all originally recorded fields plus ratios as required.

The foregoing are normally computer treated and machine plotted, so that versatility in special data treatment is easily accomplished.

Don M Wagg

July, 1976. Don M. Wagg, P.Eng.

2.2253

2.2253

MINING RECORDS OFFICE TORONTO

Ontario

Ministry of

GEOPHYSICAL – GEO TECHNICAL

31C15NW0045 2.2253 PALMERSTON

900

TO BE ATTACHED AS AN APPENDIX TO TECHNICAL REPORT
FACTS SHOWN HERE NEED NOT BE REPEATED IN REPORT
TECHNICAL REPORT MUST CONTAIN INTERPRETATION, CONCLUSIONS ETC.

Type of Survey(s) Airborne magnetic

Township ~~XXXXXXX~~ Palmerston

Claim Holder(s) R.J. Wright

RECEIVED
NOV 24 1976
PROJECTS UNIT

Survey Company

Author of Report Don M. Wagg (P. Eng)

Address of Author Ottawa, Ontario

Covering Dates of Survey July 4 - October 1, 1976
(linecutting to office)

Total Miles of Line Cut

SPECIAL PROVISIONS CREDITS REQUESTED

ENTER 40 days (includes line cutting) for first survey.

ENTER 20 days for each additional survey using same grid.

DAYS per claim

Geophysical
--Electromagnetic
--Magnetometer
--Radiometric
--Other
Geological
Geochemical

AIRBORNE CREDITS (Special provision credits do not apply to airborne surveys)

Magnetometer ~~40~~ 25.4 Electromagnetic Radiometric ~~40~~ 25.4
(enter days per claim)

DATE: Nov. 18/76 SIGNATURE: D.M. Wagg
~~Author of Report~~ or Agent

L. D.

Res. Geol. Qualifications 63. 1050

Previous Surveys

File No.	Type	Date	Claim Holder
63.2442	ground magnetometer		

OFFICE USE ONLY

MINING CLAIMS TRAVERSED
List numerically

(prefix)	(number)
EO	430528
EO	430529
EO	430530
EO	430531
EO	430532
EO	430533
EO	430534
EO	430535
EO	430536
EO	430537
EO	430538
EO	430539
EO	430950
EO	430951
EO	413648
EO	413649
EO	413650
EO	413651
EO	413652
EO	413653
EO	413654
EO	413655

TOTAL CLAIMS 22

If space insufficient, attach list

GEOPHYSICAL TECHNICAL DATA

GROUND SURVEYS – If more than one survey, specify data for each type of survey

Number of Stations _____ Number of Readings _____

Station interval _____ Line spacing _____

Profile scale _____

Contour interval _____

MAGNETIC

Instrument _____

Accuracy – Scale constant _____

Diurnal correction method _____

Base Station check-in interval (hours) _____

Base Station location and value _____

_____

ELECTROMAGNETIC

Instrument _____

Coil configuration _____

Coil separation _____

Accuracy _____

Method: ☐ Fixed transmitter ☐ Shoot back ☐ In line ☐ Parallel line

Frequency _____
(specify V.L.F. station)

Parameters measured _____

GRAVITY

Instrument _____

Scale constant _____

Corrections made _____

_____

Base station value and location _____

_____

Elevation accuracy _____

INDUCED POLARIZATION
RESISTIVITY

Instrument _____

Method ☐ Time Domain ☐ Frequency Domain

Parameters – On time _____ Frequency _____

– Off time _____ Range _____

– Delay time _____

– Integration time _____

Power _____

Electrode array _____

Electrode spacing _____

Type of electrode _____

SELF POTENTIAL

Instrument _____ Range _____

Survey Method _____

Corrections made _____

RADIOMETRIC

Instrument _____

Values measured _____

Energy windows (levels) _____

Height of instrument _____ Background Count _____

Size of detector _____

Overburden _____

(type, depth – include outcrop map)

OTHERS (SEISMIC, DRILL WELL LOGGING ETC.)

Type of survey _____

Instrument _____

Accuracy _____

Parameters measured _____

Additional information (for understanding results) _____

AIRBORNE SURVEYS

Type of survey(s) Magnetic, Radiometric

Instrument(s) See report
(specify for each type of survey)

Accuracy See report
(specify for each type of survey)

Aircraft used De Havilland DHC-2 Otter

Sensor altitude 150 to 250 feet

Navigation and flight path recovery method See report

Aircraft altitude 150 to 250 feet Line Spacing 1/4 mile

Miles flown over total area 21 Over claims only 14

GEOCHEMICAL SURVEY – PROCEDURE RECORD

Numbers of claims from which samples taken _____

_____

_____

Total Number of Samples _____

Type of Sample _____
(Nature of Material)

Average Sample Weight _____

Method of Collection _____

_____

Soil Horizon Sampled _____

Horizon Development _____

Sample Depth _____

Terrain _____

_____

Drainage Development _____

Estimated Range of Overburden Thickness _____

_____

_____

SAMPLE PREPARATION
(Includes drying, screening, crushing, ashing)

Mesh size of fraction used for analysis _____

_____

_____

_____

General _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

ANALYTICAL METHODS

Values expressed in: per cent ☐
p. p. m. ☐
p. p. b. ☐

Cu, Pb, Zn, Ni, Co, Ag, Mo, As,-(circle)

Others _____

Field Analysis (_____ tests)

Extraction Method _____

Analytical Method _____

Reagents Used _____

Field Laboratory Analysis

No. (_____ tests)

Extraction Method _____

Analytical Method _____

Reagents Used _____

Commercial Laboratory (_____ tests)

Name of Laboratory _____

Extraction Method _____

Analytical Method _____

Reagents Used _____

General _____

_____

_____

_____

_____

_____

_____

_____

_____

South Canonto Twp. (M.68)

Clarendon Twp.(M.77)

Lavant Twp.(M. 112)

Sherbrooke Twp.

n Twp.(M. 136)

Oso Twp (M.138)

THE TOWNSHIP OF 2.2253 PALMERSTON

COUNTY OF FRONTENAC

EASTERN ONTARIO MINING DIVISION

SCALE: 1-INCH = 40 CHAINS

LEGEND

PATENTED LAND	P
CROWN LAND SALE	C. S.
LEASES	L
LOCATED LAND	Loc.
LICENSE OF OCCUPATION	L.O.
MINING RIGHTS ONLY	M.R.O.
SURFACE RIGHTS ONLY	S.R.O
ROADS	
IMPROVED ROADS	
KING'S HIGHWAYS	
RAILWAYS	
POWER LINES	
MARSH OR MUSKEG	M
MINES	
CANCELLED	C.
PATENTED S.R.O.	

NOTES

This Map Is Not To Be Used FOR SURVEY PURPOSES.

Lot And Concession Lines Shown Hereon Are Projected From The Best Information Available. But Their True Position Is Not Guaranteed. For Official Survey Purposes Consult The Original Survey Plans And Field Notes Of Records In the Ministry of Natural Resources

400' surface rights reservation along the shores of all lakes and rivers

The Acreages Shown Are The Amount That Were Patented And Do Not Necessarily Represent The True Surveyed Area Of The Parcel.

Flooding Rights to 1110.5 elevation of Cross Lake. File 126113

RESERVES

(R) S.R.O. Reserved for public use. File 51910

(M) M N R Reserve

(R) SRO. Reserved sect 39(1) of Mining Act (R.S.O'60)

PLAN NO.- M.139

ONTARIO
MINISTRY OF NATURAL RESOURCES
SURVEYS AND MAPPING BRANCH

200