ROBERTSON RESEARCH (AUSTRALIA) PTY. LIMITED

REPORT NO. 550

PROJECT NO. 1052

EXPLORATION LICENCE NO. 1599
ELIZABETH DOWNS, NORTHERN TERRITORY

REPORT FOR YEAR ENDED 7TH AUGUST, 1979

by

R.E. Cotton, B.Sc., M.Aus.I.M.M.

Prepared for:

Mobil Energy Minerals Australia Inc.,
2 City Road,
MELBOURNE, 3205.

August, 1979

SUMMARY

Following an airborne radiometric survey five radiometric features were assessed geologically and radiometrically. As none of these justified further work, an exploration programme was planned which would test beneath the extensive radiometrically opaque cover. A ground magnetics phase commenced in July to locate magnetic lithologies as a basis for later auger or percussion drill testing.

CONTENTS

PLATES

1. TITLE

Exploration Licence No. 1599 was granted by the Deputy of the Administrator to Suttons Motors (Arncliffe) Pty. Ltd. for one year from 8th August, 1977. The Minister for Mines and Energy granted renewal of the whole area for a further year from 8th August,1978 to 7th August, 1979. Suttons Motors (Arncliffe) Pty. Ltd. is a member of the Sutton Group of Companies which signed a joint venture agreement with Mobil Energy Minerals Australia Inc. on 25th August, 1978. This report is compiled by Robertson Research (Australia) Pty. Ltd. for Mobil as operator of the joint venture.

The licence area is L-shaped, being bounded on the west side by 130°30' longitude and on the south side by 13°45' latitude. Its width is two minutes of longitude in the northern sector and two minutes of latitude in the southern section. The northern and eastern boundaries approximate to those of the southwestern section of the Daly River Agricultural Reserve. The area of the E.L. is 35.92 square miles (93.03 square kilometres). The first reduction, being 50 percent of the original area, came into effect on the 8th August, 1979. In the normal course of events, the licence will expire on 7th August, 1982 after two more 50 percent reductions (refer Plate 1).

2. PREVIOUS WORK

The term of the licence commenced on 8th August, 1977. Between 4th October, 1977 and 9th October, 1977 an airborne spectrometer survey of approximately 110 line kilometres was flown which covered the total licence area of 93 square kilometres. This was part of a broader programme undertaken by Suttons which spanned a number of exploration licence areas. Similarly, the photogeology of the licence area was compiled by J. Jeppe of Loxton Hunting as part of the photogeology of a broader area, co-extensive with the airborne survey. This was supplemented by reconnaissance photo-based traverses.

Using this information, five radiometric anomalies were selected for subsequent field checking. The above work is described in the Annual Report submitted by Suttons to the Northern Territory Mines Branch for that year, and has been reviewed in a report to Mobil Energy Minerals dated 21st March, 1978 by M.J. Binns of Robertson Research Australia.

A search of Northern Territory Department of Mines and Energy open file records has not identified any previous exploration of the title area, although in 1973 Australian Development Ltd. explored E.L. 677, the northern boundary of which coincides with the southern boundary of E.L. 1599.

3. PHYSIOGRAPHIC AND GEOLOGIC SETTING

Approximately one-third of the licence area is in the left bank flood plain of the Daly River, and is water covered for much of each year. A chain of perennial lagoons across the northern half of the 'L' cuts the most northerly sector off from any access except by wide-tracked vehicles. This area is occupied by heavy black soils vegetated by grass and reeds only, with no timber. Deep dessication cracks open in the soil when drying takes place during September-October.

Low undulating knolls project out of the flood plain and occupy the southern two-thirds of the licence area. There is very little outcrop and the geology is somewhat conjectural. Quartzitic and pegmatitic surficial rubble is widespread. The float derives from linear developments of quartzite and quartz breccia along fault zones. These cut across the observed northwest-southeast photo trends. The pegmatitic developments consist of quartz, potassic felspar and coarse muscovite plates, and indicate late stage pneumatolytic activity related to intrusive phases within the Litchfield Granite Complex.

Much of the licence area is traversed by well-defined linear magnetic bodies. In one or two instances, we have been able to relate these to outcrop or sub-outcrop of meta-basic lithologies, after dolerite or gabbro.

The surface expression of the amphibolite Litchfield Complex rocks is limited to the pegmatite developments noted above. Some outcrops of a fairly fine grained, moderately well foliated quartz, felspar, and biotite or muscovite gneiss, together with two occurrences of granulite facies metamorphic rocks including biotite-kyanite schists have been ascribed to the Hermit Creek Metamorphics of possible Archaean age.

The presence of Cambrian cover in the area is conjectural, but could well be the case in the flood plain area. The abundance of Proterozoic (?Archaean) rubble over the balance of the area militates against significant developments of Cambrian cover rocks related to the Cambro-Ordovician Daly River Basin away from the flood plain.

4. EXPLORATION 8TH AUGUST 1978-7TH AUGUST 1979

Ground follow-up of air radiometrics.

The first phase of exploration for the second licence year was the ground assessment of radiometric features which evolved from examination of the airborne analog data.

The parameters of the airborne survey which are important for placing the results of the ground assessment phase in context are:

(a) The nominal line spacing was a half mile (880 metres). In general, this was achieved reasonably well, although in two instances there are gaps extending to 1.3 kilometres between flight lines.

(b) The nominal terrain clearance was 300 feet or 90 metres. Altitude corrections have not been made, although in this area the effects of differential atmospheric attenuation in the K, U and Th channels have remained virtually constant, as in this low topographic relief good control of terrain clearance has been achieved.

(c) The track recovery was made using a 35 mm continuous strip film camera. This record has been particularly useful during the ground checks.

(d) Inter-channel corrections using stripping ratios, necessitated by the Compton scatter effect, have not been applied to the data. Background correction was made in the radiation channels by setting the zeros at 2,000 feet (600 metres) altitude. This implies that backgrounds for the survey are somewhat high due to the lesser atmospheric absorption of cosmic radiation at that altitude.

(e) Early flights suffered from problems with the energy settings on the spectrometer. These were cleared after run 91W and do not affect the data for the licence area.

The above limitations in the data would become critical if one is being fairly selective in nominating radiometric features for follow-up, especially on the basis of U/Th ratios, but in this instance, as most features of possible interest were included in the ground survey, the raw analog data were considered adequate.

Each radiometric feature was visited using either vehicle or helicopter between 9th and 11th December, 1978. The initial location of the anomaly position was obtained by making a print of the relevant section of the tracking film, identifying the photo characteristics of the anomaly fiducial position and transferring the photo location to the 1:87,000 RC9 photograph. Navigation using the RC9 brought the field crew to within 100-200 metres of the theoretical position of the anomaly. The anomaly positions are shown on Plate 2. They are numbered according to minutes longitude/minutes latitude.

The final ground positioning was obtained by detailed photo location using the tracking print. This base point was marked with a steel picket, and a radiometric traverse was developed from it parallel to the flight line, usually along magnetic east-west. North-south cross-lines were then set off according to the findings of the initial profile, supplemented by scintillometer prospecting, bearing in mind that the airborne crystal was effectively inspecting a strip approximately 200 metres wide. The findings of the ground survey are summarised in Table 1. In general, the ground 'anomalies' could be classified as follows:

(a) Clay pan and drainage flood plain anomalies, presumably due to the absorption of uranium daughter elements on clays in local depressions where later evaporation has taken place.

(b) Anomalies generated by outcrop effect, in particular that of felspathic rocks, for example gneiss and pegmatite.

Of the five anomalies examined, there were none which showed sufficient potential to justify further work.

5. MAGNETIC SURVEYS

In view of the high percentage of radiometrically opaque cover within the licence, it was considered necessary to supplement the airborne radiometric approach with techniques which would test beneath the eluvial and alluvial cover. The magnetic data acquired during the airborne survey suggest that contacts exist between a lithology with a low magnetic intensity background and an assemblage of intercalated linear, high and low magnetic intensities. It is proposed to test the contact zone between these two assemblages by auger and/or percussion drilling. This will be guided by the results of a ground magnetics programme currently being carried out on a grid base.

The base line for the grid runs north-south and approximately bisects the western sector of the licence area. Cross lines are being run for approximately 2 kilometres east and west of the base lines. Readings are being taken at 25 metre intervals on all lines. The base line profile is shown as Figure 1.

SUTTONS MOTORS MANAGEMENT

114 BOURKE STREET, EAST SYDNEY, 2011

AUSTRALIA

TELEPHONE
357 1777
TELEX AA22856

CABLES & TELEGRAMS
"SUTSYD" POTTS POINT

The Secretary,
Department of Mines and Energy,
Mines Division,
P.O. Box 2901,
DARWIN N.T. 5794

5th November, 1979

Dear Sir,

Yearly Reports

Enclosed please find review of activities during the year ended 7th August 1979 for the following Exploration Licenses:-

E. L. No.	Holder	Expenditure Undertaken	Actual Expenditure
1355	Suttons Motors (Darwin) Pty. Ltd.	20,000	22,000
1356	Suttons Motors (Arncliffe) Pty. Ltd.	20,000	86,000
1357	Sydney Motor Auctions Pty. Ltd.	20,000	22,000
1358	Autopool Pty. Ltd.	12,000	4,000
1359	Gilbert & Roach Pty. Ltd.	20,000	84,000
1597	Autopool Pty. Ltd.	6,000	8,000
1598	Autopool Pty. Ltd	3,000	3,000
1599	Suttons Motors (Arncliffe) Pty. Ltd.	12,000	9,000
		$113,000	$238,000

Yours faithfully,
SUTTONS MOTORS MANAGEMENT

F. P. Coyne
PROPERTY MANAGER

OPEN FILE

TABLE 1

EL. 1599

AIRBORNE ANOMALY CHARACTERISTICS AND GROUND ASSESSMENT RESULTS

79/167

Run No.	Flt. No.	Fiducials of E.L. Boundaries		Date Flown	Anom. No.	Fiducial of Anom. Centre	Chart Characteristics	Date of Ground Assessmt.	Results of Ground Assessment	Fiducials of Magnetic Features
		West	East							
420W	32	22712.4	22704.7	9-10-77	-	-				22713.0-12.7
430W	32	22357.7	22365.7	9-10-77	-	-				22357.2-57.7 22359.7-60.1 22362.4-62.7
440W	32	22312.6	22304.3	9-10-77	30/38	22311.5	U, Th, Tc, mag blips	9-11-78	Claypan anomaly U = 1.3.x Bcg	22311.6-11.4 22310.9-10.6 22309.6-09.2 22307.7-07.1 22305.0-04.0
450E	30	20901.0	20908.9	5-10-77	-	-				20901.3-1.7 20904.2-4.5
461W	30	20844.7	20837.2	5-10-77	-	-				
470E	30	20442.5	20450.0	5-10-77	-	-				20443.0-44.2 20445.0-45.5
480W	30	20385.4	20377.9	5-10-77	-	-				20382-83 20384-4.7
490E	30	20011.7	20020.0	5-10-77	-	-				20020.1-20.6 20015.4-16.3 20011.7-11.3
500W	30	19947.0	19938.7	5-10-77	-	-				19564.4-64.9 19566.0-66.4
510E	29	19562.6	19570.6	4-10-77	30/41	19562.8	U blip, weak Tc, Th, K.	9-11-78	Clay pan anomaly U = 1.6 x Bcg	19568.0-68.7
520W	29	19505.0	19496.8	4-10-77	-	-				19500.3-500.9
530E	29	19164.4	19172.0	4-10-77		19176.6	U blip		Outside EL	19163.2-64.2 19166.4-66.7 19167.5-67.7
540W	29	19102.0	19071.3	4-10-77		19099.8	Tc blip between two mag. peaks.		Surficial	19080.1-079.5 19090.1-090.4 19098.9-99.4 19100.3-100.8
550E	29	18741.0	18772.0	4-10-77		18752.1	U, Th blip		Surficial	18744.1-44.5 18745.8-46.3 18756.2-56.6 18765.5-66.6
560W	29	18682.0	18650.8	4-10-77		18653.3	U blip		Surficial	18656.8-57.2 18676.0-76.6
570E	29	18315.8	18346.8	4-10-77		18315.1	U blip		Outside E.L.	18341.6-342.0

Exploration Licence No. 1599 (Elizabeth Downs):

7-1-K

1979 Program

Hole	Standing water Level
EP.1 to 3	dry
EP.4	8.0M
EP.5	dry
EP.6	10.0M
EP.7 to 15	dry
EP.16	18.0M
EP.17 to 20	dry
EP.21	19.0M
EP.22	dry
EP.23	26.0M
EP.24/25	dry
EP.26	14.0M
EP.27	12.0M
EP.28 to 30	drilled with water - SWL unknown
EP.31 to 33	dry
EP.34	drilled with water - SWL unknown

EXPLORATION LICENCE BOUNDARIES (JANUARY 1978)
Enclosure 2

AOG 1409 (appln)
AOG 1408 (appln.)
CRA 971
MINAD 1296
MINAD 1297
MINAD 1298
CRA 1239
AOG 1563
MINAD 1295
1618 URANERZ
IMC 1181
1756, 1757
Vac.
CRA 610
IMC 1219
PURICH
MAGNUM 739
MAGNUM 995
OPTIMAL 1653
DESTINY PROSPECTING 1344
KOBERSTEIN 1140
GEOPEKO, NORD, DAMPIER, CRA
N CEMENT 1490
N. CEMENT 1373
N. CEMENT 1426
SUTTON 1356
NORD 1600
SUTTON 1826 (application)
SUTTON 1359
SUTTON applications 1827, 1828, 1830
SUTTON 1599
SUTTON 1829 (application)
SUTTON 1357
SUTTON 1355
AOG 1405
AOG 1404 (Appln.)
PLACER 1236
PLACER 1340
AOG 1403 (Appln)
SUTTON 1597
SUTTON 1598
KAY, DAY 1281
KAY 1135
SUTTON 1358
Vac.
A

13°00' 13°30' 14°00' 14°30' 15' 131°00'

EXPLORATION LICENCE AREAS (BOTH GRANTED AND UNDER APPLICATION)
AND SUTTONS GROUP PASTORAL LEASE BOUNDARY
Enclosure 2

SCALE 1:250,000

NOTE: OVELAY TO ENCLOSURE 1

Plan prepared by
ROBERTSON RESEARCH(AUST) PTY. LTD.
Moss Vale Rd
Bowral, 2576, NSW

Date: 12.3.78 — Drwg. No. 663

LEGEND

SUTTON 1599 — EXPLORATION LICENCE HOLDER (ABBREVIATED) & TITLE NUMBER

A — AREA APPLIED FOR — APPLICANT UNKNOWN

Vac. — AREA VACANT

GOVERNMENT RESERVE

TIPPERARY PASTORAL LEASE BOUNDARY

505

ELIZABETH DOWNS E.L.1599

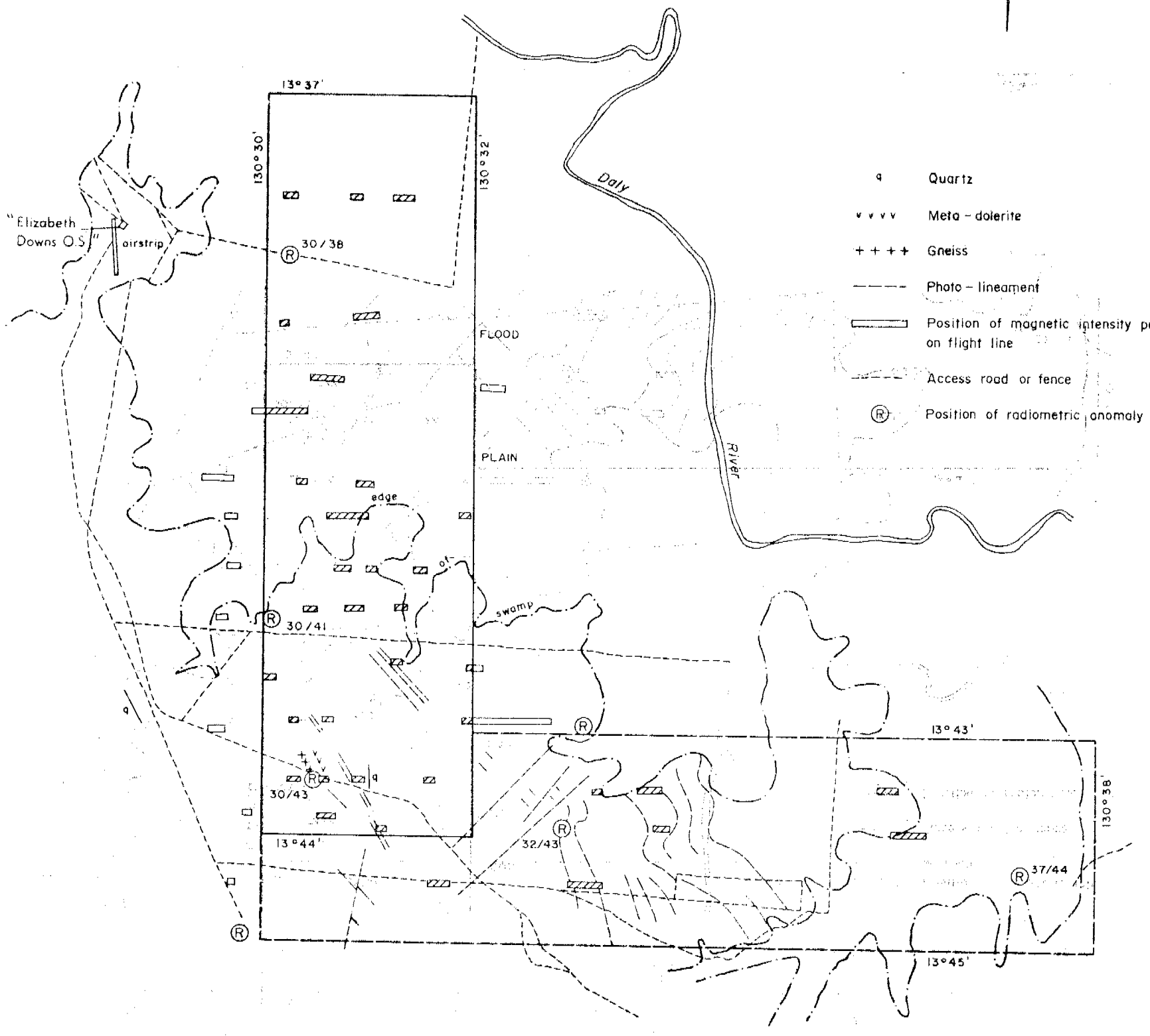
SCALE 1:88,400

0 1 2 4 6 km

T.N.

M.N.

3°14'



- q — Quartz
- v v v v — Meta – dolerite
- + + + + — Gneiss
- ———— Photo – lineament
- Position of magnetic intensity peak on flight line
- ———— Access road or fence
- Ⓡ Position of radiometric anomaly

DWG. No. 1663

MOBIL ENERGY MINERALS AUSTRALIA

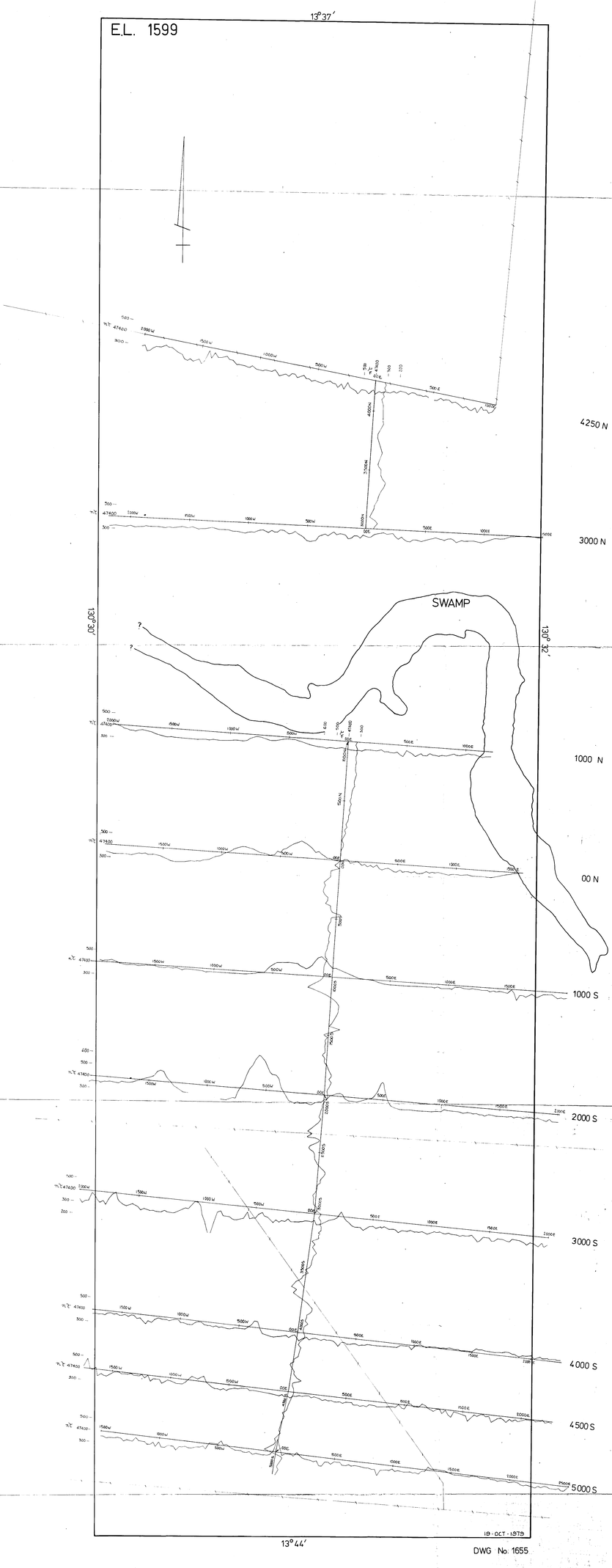
E.L. 1599 (ELIZABETH DOWNS)

1979 MAGNETIC SURVEY

0 4 8 MILES

0 4 8 12 KILOMETRES

SCALE 1 : 10 000



19 - OCT - 1979

DWG No. 1655

PLATE 3