

DKSG

702001

73-929

MICROFILMED

GEOPHYSICS

REPORT ON
DRILL HOLE TEST SURVEYS
SOUTH COMET PROSPECT
E. DUNDAS NORTH WEST TASMANIA

by

SEIGEL ASSOCIATES AUSTRALASIA PTY. LTD.

702002

REPORT ON
DRILL HOLE TEST SURVEYS
SOUTH COMET PROSPECT
MT. DUNDAS NORTH WEST TASMANIA
ON BEHALF OF
GEOPHOTO RESOURCES CONSULTANTS

702003

PRIVATE AND CONFIDENTIAL

REPORT ON
DRILL HOLE TEST SURVEYS
SOUTH COMET PROSPECT
MT. DUNDAS NORTH WEST TASMANIA
ON BEHALF OF
GEOPHOTO RESOURCES CONSULTANTS

BY

A.W. HOWLAND-ROSE
M.Sc., DIC, AMAusIMM, FGS.
GEOPHYSICIST

SYDNEY, N.S.W.

JANUARY, 1973

TAS - 011

C O N T E N T S

Summary	
Introduction	Page 1
Previous Geophysical Work	Page 2
The Methods	Page 2
Discussion of Results	Page 4
Conclusions	Page 7
Recommendations	Page 8

Figure 1 - Locality Plan

Plate 1 - Data Profiles

SEIGEL ASSOCIATES AUSTRALASIA PTY. LTD.

GEOPHYSICAL CONSULTANTS AND CONTRACTORS

S U M M A R Y

In marked contrast to core tests carried out on South Comet ore in November, 1972, diamond drill hole resistivity methods and further core tests at South Comet indicate the galena ore to be conductive. Down hole and surface applied potential methods are strongly recommended as an aid to the exploration and evaluation of this, and like deposits in the area.

REPORT ON
DRILL HOLE TEST SURVEYS
SOUTH COMET PROSPECT
MT. DUNDAS NORTH WEST TASMANIA
ON BEHALF OF
GEOPHOTO RESOURCES CONSULTANTS

INTRODUCTION

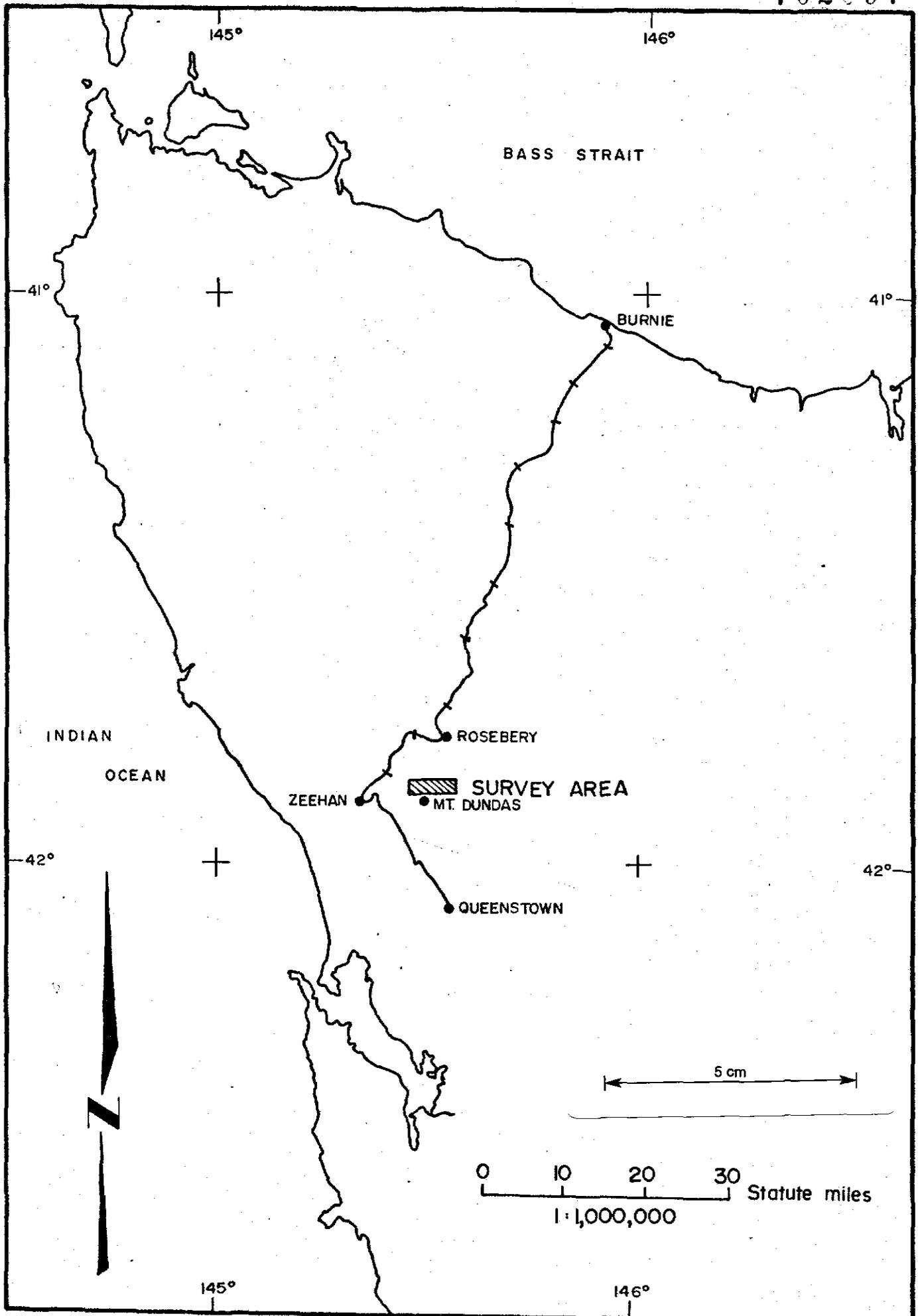
On the 12th January, 1973, Seigel Associates Australasia Pty. Ltd. executed induced polarization and resistivity down hole surveys and applied potential surveys at South Comet prospect, Mt. Dundas, near Zeehan, Tasmania. These surveys were performed at the request of Dr. J.D. Juillard Projects Manager for Geophoto Resources Consultants. The field work was under the immediate direction of Mr. E. Hope with local assistants being provided by Geophoto. Technical supervision of the project was provided by Mr. A.W. Howland-Rose.

The objects of the survey were:

- 1 - To log the induced polarization and resistivity characteristics of mineralised zones and the enclosing host rock.
- 2 - To test the electrical continuity of sulphide ore, sulphide shear fillings and graphite zones between intersections in the various diamond drill holes.

SOUTH COMET PROSPECT, MT. DUNDAS AREA
LOCALITY PLAN, TAS. OIL

702007



Page -- two

3 - To demonstrate, test and evaluate the potentiality of drill hole techniques to assist in a more rapid, meaningful and economic evaluation of the South Comet deposits.

PREVIOUS GEOPHYSICAL WORK

Core tests on certain diamond drill cores from South Comet were carried out by Seigel Associates Australasia Pty. Ltd. in October, 1972 and reported on by A.W. Howland-Rose in Report TAS-007.

THE METHODS

In the present survey two down hole techniques were applied. The following very brief and simplified comments are made on these methods.

1 - Three Array Logging: This method was used to ascertain conductivity (resistivity) and induced polarization characteristics of the ore zones, fault zones and host rocks.

In this case the logging tool used consisted of a current (pole) electrode and two potential (dipole) electrodes down hole with a further current electrode at infinity. The current pole and potential dipole electrodes were equi-spaced at 1.52 m intervals in this application, which

003
Page - - three

sums information for a diameter of approximately $1\frac{1}{2}$ m around the hole. A diagrammatic representation of the tool together with the current flow lines and equipotential surfaces are shown in Plate 1.

In addition, multi-spaced three arrays can be used to seek near misses, ascertain the distance from the hole of near misses located as part of Applied Potential surveys, or ascertain the significance of minor intersections away from the hole.

2 - Applied Potential (Mise-a-la-Masse): Once the sulphides making up the zone of interest have been proved to be conductive relative to the enclosing host rocks and to the overburden, a current electrode is placed in the sulphide zone with further current electrodes placed at a distance from the body to approximate an infinite. The sulphide zone in effect becomes a pole source of the conducting sulphides, and therefore the equipotential surfaces will parallel the shape of this conductor. A potential dipole is used on surface to trace out the projection of the conductive sulphides on the surface. In practice, however, the distant electrode cannot act as an infinite and the gradient of the potential field on the distant electrode side will be steeper

Page - four

than on the reverse side. A multiplicity of distant electrodes will give the same results as a true infinite. This technique however, was not thought to be necessary in this case.

In the present circumstances large potential differences spanning three orders of magnitude were recorded and therefore it was not necessary to correct the results for distance from the potential. The potential of a pole source within a medium is given by the relation:

$$V_p = \frac{\rho I}{2\pi r}$$

V_p = voltage ρ = resistivity I = current
 r = distance to source

DISCUSSION OF RESULTS

Drill Hole Log - South Comet 14

Induced polarization and resistivity drill hole logs were carried out down hole SC-14 which intersected two zones carrying heavy sulphide mineralisation, including galena, of the order of 15%. The hole was logged using a 1.52 m (5 ft.) three array logger with stations at 1.52 m (5 ft.) intervals. The data is displayed on Plate 1 at the down hole scale of 1:100, with a chargeability scale of 1 cm = 5 milliseconds and the resistivity (conductivity) is presented on a 5 cm log cycle.

010
Page - five

Meaningful resistivity and chargeability data was obtained from 18 m to a depth of 62 m where the hole was blocked. Resistivity through the host rocks varied from 500 ohm-meters to 1000 ohm-meters with minimal background chargeability. Two quite distinct conductive zones centred at approximately 45 m and 56 m, having a width of the order of 2 m to 2.5 m were recorded coincident with intersections running over 15% galena. These zones, designated Zone 1 and Zone 2 respectively on Plate 1, show conductivities of the order of 1 mho/meter and are therefore some 500 to 1000 times more conductive than the enclosing host rocks. In addition, both zones show distinct chargeability highs coincident with the conductive zones. The area between the holes is resistive but exhibits higher than background chargeabilities indicating the presence of disseminated sulphides.

The apparent DC conductivity width products of these two zones are of the order of 2 - 3 mhos, which, due to mass effect, is considered to be an under estimate.

The geological log recorded massive galena between 53 m and 55.7 m and the electromagnetic conductivities of this zone and the wall rocks are presented in Table I. These confirm a higher conductivity width product of the order of 25 to 50 mhos, indicating mineralisation of this type to be

011
Page - six

capable of detection by the Turam or Turair technique, providing significant strike and depth extent are present.

As each of the above zones gave significant conductivity relative to the enclosing host rocks, and since there is excellent correlation between the conductive chargeable response and the significant mineralisation it is concluded that these intersections, if geophysically typical of the South Comet lodes, present an ideal environment for the applied potential method.

Down Hole Applied Potential Surveys - SC-15

Zones 1 and 2 in SC-14 were energised and drill hole SC-15 logged using a single potential in order to establish if any mineralisation in SC-15 was electrically continuous with either Zones 1 or 2 in SC-14, or to establish if any "near miss" situation existed, and if so, where.

The data for the two logs is presented on Plate 1 at a down hole scale of 1:100. Potential (Vp) was plotted using a 5 cm log scale, and the chargeability utilised a scale of 1 cm = 5 milliseconds.

When Zone 1 was energised the only significant response was

012
Page - seven

recorded centred at 59.5 m. No other mineralisation in this hole had any connection with Zone 1. When Zone 2 was energised the sulphide mineralisation in the lower section of the hole again showed no response indicating no electrical continuity between it and Zone 2.

Unfortunately time did not permit further work.

CONCLUSIONS

- 1 - The contrast in resistivities encountered in SC-14 between the mineralisation and the host rocks are in excess of 1:500.
- 2 - Correlation between the conductive zones and the high galena mineralisation is excellent in hole SC-14.
- 3 - Very high resistivities were recorded in the host rocks.
- 4 - The electromagnetic conductivity width products infer the mineralisation to be capable of detection by the Turam and Turair methods, providing depth and strike extent is present.

It is therefore concluded that should the two galena intersections be considered to be geophysically characteristic of the ore sought at South Comet, both surface and down hole

013
Page - eight

equipotential surveys can be carried out to yield diagnostic data as to the surface projection and between hole deposition of these deposits.

RECOMMENDATIONS

It is therefore recommended that the applied potential method be utilised as an integral part of the programme to delineate and define the lode system at South Comet by both surface and down hole surveys. The recommended procedure being as follows:

- 1 - Significant intersections should be energised and their surface manifestations should be mapped by a detailed potential survey along grid lines. These lines should be at 2/3 of the expected strike length of the bodies, and stations should be read at 12.5 m intervals.
- 2 - Where possible, down hole logs should be carried out to ascertain electrical continuity between intersections and to test for "near miss" situations.
- 3 - Where "near miss" situations are indicated, multi-spaced three array surveys could, where necessary, be carried out in the vicinity of the anomaly only to define the distance of the "near miss" from the hole.

01A
Page - nine

4 - Using the above data, equipotential maps and sections should be plotted in order to unambiguously define the bodies and therefore assist the drilling programme on a progressive basis.

In addition to the arrays demonstrated in the present one day test survey, there are a myriad of others which fulfil particular requirements. It is therefore essential that prior to the commencement of drill hole work the precise objectives of the programme are communicated to the geophysicist.

Finally, it should be understood that tests carried out over one day only cannot be considered to produce sufficient data from which to make concrete conclusions. However, the results obtained in the present survey are highly encouraging. An extension of the test work discussed in this report is strongly recommended to verify the conclusions reached above.

Respectfully submitted on behalf of:

SEIGEL ASSOCIATES AUSTRALASIA PTY. LTD.



A.W. HOWLAND-ROSE, M.Sc., DIC, AMAusIMM, FGS.

GEOPHYSICIST

015

702016

CONDUCTIVITY TESTS SC-14

Wall Rock: Three samples from 58.5 m to 58.9 m

- a) 2 mhos/meter
- b) 3.5 mhos/meter
- c) 2 mhos/meter

Sample from 51 m

2 mhos/meter

Ore Samples: 53 m to 55.7 m (massive galena)

As small chips were analysed, results should be regarded qualitatively only. The order of magnitude will, however, be accurate.

- a) 10.5 mhos/meter
- b) 25.6 mhos/meter
- c) 14.1 mhos/meter
- d) 11.4 mhos/meter

TABLE I

702017

Position (meters)	Susceptibility ($\times 10^{-6}$)	% Magnetite	Position (meters)	Susceptibility ($\times 10^{-6}$)	% Magnetite
50.2	20	Ø	54.7	110	0.09
50.5	22	Ø	54.9	100	0.08
50.7	22	Ø	55.0	46	Ø
51.0	22	Ø	55.2	38	Ø
51.3	28	Ø	55.4	46	Ø
51.5	27	Ø	55.7	42	Ø
51.8	28	Ø	55.9	31	Ø
52.0	27	Ø	56.1	42	Ø
52.3	27	Ø	56.4	70	Ø
52.6	27	Ø	56.6	64	Ø
53.0	29	Ø	56.8	42	Ø
53.3	38	Ø	57.0	31	Ø
53.6	60	Ø	57.3	42	Ø
53.9	90	Ø	57.6	38	Ø
54.1	140	0.115	57.9	60	Ø
54.3	130	0.108	58.1	31	Ø
54.5	82	Ø	58.3	38	Ø
			58.4	38	Ø

Heavy galena mineralisation - 53.0 to 55.7 meters

Ø - negligible

SOUTH COMET 15
 Energised from Zone 1
 South Comet 14

25 metres

30

35

40

45

50

55

60

65

70

75

80

85

90

95

100 metres

surface

20 metres

25

30

35

40

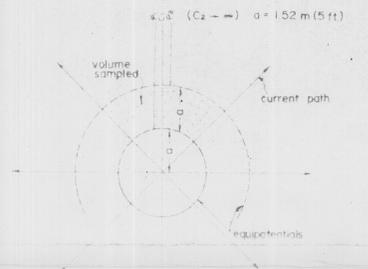
45

50

55

60 metres

THREE ARRAY LOGGER



ZONE 1

ZONE 2

Chargeability in milliseconds

RC A 60 40 30 20 10 0

DATE

Conductivity mhos/metre

1000 500 100 50 10 5

Resistivity ohm-metre

SOUTH COMET 15

Energised from Zone 2
 South Comet 14

GEOFOTO RESOURCES CONSULTANTS

LEGEND

CHARGEABILITY SCALE 1 cm = 5 milliseconds

SYMBOL

RESISTIVITY SCALE 5 cm = 1 Logarithmic cycle

SYMBOL

Vp SCALE 5 cm = 1 Logarithmic cycle

SYMBOL

SCALE 1:100

SOUTH COMET PROSPECT
 MT. DUNDAS
 N.W. TASMANIA

DRILL HOLE TEST SURVEY
 DATA PROFILES

SURVEYED AND COMPILED BY
 SEIGEL ASSOCIATES AUSTRALASIA PTY LTD.

JANUARY 1973



2 0 2 5
 Scale in metres

JOB No. TAS 011 SHEET 1 of 1 PLATE 1

017
 73-929

Chargeability in milliseconds
 30 25 20 15 10

Primary voltage (vp) in millivolts
 20 10 5 1 5

Chargeability in milliseconds
 25 20 15 10
 Primary voltage (vp) in millivolts
 40 30 20 10