ROMULUS RESOURCES LTD.

ASSESSMENT REPORT - 1992 EXPLORATION PROGRAM

PINE PROPERTY

OMINECA MINING DIVISION BRITISH COLUMBIA CANADA

VOLUME III

A GEOPHYSICAL REPORT ON AN INDUCED POLARIZATION SURVEY ON THE PINE PROPERTY

BY

Daniel A. Klit, B.Sc. and John Lloyd, M.Sc., P. Eng. GEOLOGICAL BRANCH ASSESSMENT REPORT

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PART_ S OF



APRIL 1993

A GEOPHYSICAL REPORT ON AN INDUCED POLARIZATION SURVEY ON THE PINE PROPERTY OMINECA MINING DIVISION BRITISH COLUMBIA

> LATITUDE 57°14'N LONGITUDE 126°45'W N.T.S. 94E/2

> > FOR

ROMULUS RESOURCES LTD.

BY

Daniel A. Klit, B.Sc. and John Lloyd, M.Sc., P.Eng. LLOYD GEOPHYSICS INC.

NOVEMBER, 1992



SUMMARY

During the period August 2 to September 2, 1992, Lloyd Geophysics Inc. carried out a time domain Induced Polarization (IP) survey over parts of the PINE Property in north-central British Columbia for Romulus Resources Ltd.

The IP survey outlined what has been interpreted as a large sulphide system which has been divided into 5 distinct zones, two of which have not been closed off by the IP survey.

Zone 1 is the largest and is recommended for a systematic drill programme in conjunction with a more detailed IP survey on lines 100 metres apart to assist in spotting drill holes in overburden covered areas.

In addition to Zone 1 drilling a total of 1650 metres in 13 holes has been recommended to test Zones 2,3,4 and 5. Additional IP has also been recommended to close off Zone 3 to the north-east and Zone 5 to the south-west.



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1.0 INTRODUCTION

During the period August 2 to September 2, 1992, Lloyd Geophysics Inc. carried out a time domain Induced Polarization (IP) survey on the Pine Property in north-central British Columbia for Romulus Resources Ltd.

The IP survey was designed as an extension of a previous survey carried out by the author in 1990. Its purpose was to further delineate a large sulphide system and to locate and identify additional IP responses associated with a copper-gold porphyry system.

2.0 PROPERTY LOCATION AND ACCESS

The Pine Property is located approximately 250 kilometres northwest of Germansen Landing, British Columbia along the Finlay River. The claims are centred on latitude 57°14'N, longitude 126°45'W in the Omineca Mining Division (Figure 1), N.T.S. 94E/2.

Access to the property is by truck from Windy Point or Fort St. James, B.C. via logging roads following signs to the Cheni Mine Road. The turnoff to the property is at kilometre 52 on the Cheni Road. From here the property is approximately 21 kilometres by road. Access by air is via the Sturdee Valley Airstrip at kilometre 74 on the Cheni Road and then by truck.

3.0 PROPERTY STATUS AND CLAIM HOLDINGS

The Pine Property is comprised of 38 contiguous mineral claims totalling 439 units. Pertinent claim information as provided by Romulus Resources Ltd. is listed in Table 1. The claims





and their relative locations are shown in Figure 2.

4.0 REGIONAL GEOLOGY

The Pine Property lies in an assemblage of volcanic and sedimentary rocks characteristic of those found elsewhere within the Quesnel Trough. The volcanics are alkaline to subalkaline and have been intruded by monzonite and other plutonic systems. This assemblage is known for its large copper-gold porphyry systems such as the Mt. Milligan deposit and the nearby Kemess deposits.

5.0 INSTRUMENT SPECIFICATIONS

The equipment used to carry out this survey was a time domain measuring system consisting of a Wagner Leland/Onan motor generator set and a Mark II transmitter manufactured by Huntec Limited, Toronto, Canada and a 6 channel IP-6 receiver manufactured by BRGM Instruments, Orleans, France.

The Wagner Leland/Onan motor generator supplies in excess of 7.5 kilowatts of 3 phase power to the ground at 400 hertz via the Mark II transmitter.

The transmitter was operated with a cycle time of 8 seconds and the duty cycle ratio: [(time on)/(time on + time off)] was 0.5. This means the cycling sequence of the transmitter was 2 seconds current "on" and 2 seconds current "off" with consecutive pulses reversed in polarity.



TABLE 1 CLAIMS DATA

ROMULUS RESOURCES LTD. PINE PROPERTY

NTS 94E/2, 94E/7

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Omineca Mining Division 15-Oct-92					
Claim	Record	Tenure	Units	Record	Expiry
Name	Number	Number		Date	Date
Fin 3	3064	238305	1	31-Jui-80	31-Jul-99
Fin 11	9663	240089	20	11-Aug-88	11-Aug-99
Fin 12	9664	240090	20	11-Aug-88	11-Aug-99
Fin 14	9665	240091	20	11-Aug-88	11-Aug-99
Fin 16	9666	240092	Ó	11-Aug-88	11-Aug-99
Fin 17	9667	240093	8	11-Aug-88	11-Aug-99
Fin 18	9668	240094	12	11-Aug-88	11-Aug-99
Fin 19	9669	240095	6	11-Aug-88	11-Aug-99
Fin 20	11441	241595	20	13-Feb-90	13-Feb-99
Fin 21	11442	241596	16	13-Feb-90	13-Feb-99
Easter 1	11765	241918	16	16-Apr-90	16-Apr-99
Easter 2	11766	241919	12	16-Apr-90	16-Apr-99
Easter 3	11767	241920	20	16-Apr-90	16-Apr-99
Easter 4	11768	241921	20	17-Apr-90	17-Apr-99
Easter Seal	303156	303156	20	08-Aug-91	08-Aug-93
Fin 21	308119	308119	20	14-Mar-92	14-Mar-93
Fin 22	308120	308120	20	14-Mar-92	14-Mar-93
Fin 23	308121	308121	20	14-Mar-92	14-Mar-93
Fin 24	308122	308122	20	14-Mar-92	14-Mar-93
Fin 25	308123	308123	20	14-Mar-92	14-Mar-93
Fin 26	308124	308124	20	14-Mar-92	14-Mar-93
Song 1	310079	310079	20	29-May-92	29-May-93
Song 2	310064	310064	20	30-May-92	30-May-93
Egg 1	310065	310065	15	29-May-92	29-May-93
Egg 2	310066	310066	15	29-May-92	29-May-93
Song 3	310038	310038	1	31-May-92	31-May-93
Song 4	310039	310039	1	31-May-92	31-May-93
Song 5	310040	310040	1	31-May-92	31-May-93
Song 6	310041	310041	1	31-May-92	31-May-93
Song 7	310042	310042	1	31-May-92	31-May-93
Song 8	310043	310043	1	31-May-92	31-May-93
Song 9	310044	310044	1	31-May-92	31-May-93
Song 10	310045	310045	1	31-May-92	31-May-93
Ly 1	310081	310081	20	30-May-92	30-May-93
Ly 2	310060	310060	1	30-May-92	30-May-93
Ly 3	310061	310061	1	30-May-92	30-May-93
Ly 4	310062	310062	1	30-May-92	30-May-93
Ly 5	310080	310080	1	30-May-92	30-May-93

TOTAL # CLAIMS TOTAL # UNITS

Lloyd Geophysics



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The IP-6 receiver can read up to 6 dipoles simultaneously. It is microprocessor controlled, featuring automatic calibration, gain setting, SP cancellation and fault diagnosis. To accommodate a wide range of geological conditions, the delay time, the window widths and hence the total integration time is programmable via the keypad. Measurements are calculated automatically every 2 to 4 seconds from the averaged waveform which is accumulated in memory.

The window widths of the IP-6 receiver can be programmed arithmetically or logarithmically. For this particular survey the instrument was programmed arithmetically into 10 equal window widths or channels, Ch_0 , Ch_1 , Ch_2 , Ch_3 , Ch_4 , Ch_5 , Ch_6 , Ch_7 , Ch_8 , Ch_9 (see Figure 2). These may be recorded individually and summed up automatically to obtain the total chargeability. Similarly the resistivity (ρ_a) in ohm-metres is also calculated automatically.

The instrument parameters chosen for this survey were as follows:

Cycle Time (T _c)	= 8 seconds
Ratio (Time On) (Time Off)	= 1:1
Duty Cycle Ratio	
(Time On) (Time On)+(Time Off)	= 0.5
Delay Time (T _D)	= 120 milliseconds
Window Width (t_p)	= 90 milliseconds
Total Integrating Time (T _p)	= 900 milliseconds





BRGM IP-6 RECEIVER PARAMETERS

Figure 3



 $\tau = m_{1}^{2} \tau$

6.0 SURVEY SPECIFICATIONS

The configuration of the POLE-DIPOLE array employed on this survey is shown below:



x = 50 metres n = 1, 2, 3 and 4 (with n = 5 and 6 in some areas)

On the Pine Property, the current electrode C_1 , was EAST of the potential measuring dipole P_1P_2 . Here the measurements were taken for x = 50 metres and n = 1, 2, 3, 4 and in some areas n=6 on lines 300 metres apart. The dipole length (x) is the distance between P_1 and P_2 and determines mainly the sensitivity of the array. The electrode separation (nx) is the distance between C_1 and P_1 and determines mainly the depth of penetration of the array.

7.0 DATA PROCESSING

At the end of each survey day the data was processed and plotted in the field for a quick review of anomalies, data integrity checks and inspection by the client's representative.

In the office the data was transferred to a Compaq 386 and merged with the 1990 data for preparation of final pseudo-sections and contour plan maps on mylar.



8.0 DATA PRESENTATION

The data described in this report are presented on 39 pseudo-sections and 2 contour plan maps as follows:

Pseudo-Sections

Line No.	Dwg. No.	Line No.	Dwg. No.
7600N	92335-01	12100N	92335-21
7900N	92335-02	12200N	92335-22
8200N	92335-03	12400N East & West	92335-23
8500N	92335-04	12600N	92335-24
8800N	92335-05	12700N	92335-25
9100N	92335-06	12800N	92335-26
9400N	92335-07	13000N East & West	92335-27
9700N	92335-08	13200N	92335-28
10000N East & West	92335-09	13400N	92335-29
10300N	92335-10	13600N	92335-30
10600N	92335-11	13800N	92335-31
10800N	92335-12	14000N	92335-32
10900N	92335-13	14200N	92335-33
11000N	92335-14	14600N	92335-34
11200N East & West	92335-15	15000N	92335-35
11400N	92335-16	14800N	92335-36
11500N	92335-17	15100N	92335-37
11600N	92335-18	15400N	92335-38
11800N East & West	92335-19	15700N	92335-39
12000N	92335-20		



<u>Plan Maps</u>	Dug Na
Chargeability Triangular Filter Map	92335-40
Resistivity Triangular Filter Map	92335-41

9.0 DISCUSSION OF RESULTS

An IP response depends largely on the following factors:

- 1. The volume content of sulphide minerals
- 2. The number of pore paths that are blocked by sulphide grains
- 3. The number of sulphide faces that are available for polarization
- 4. The absolute size and shape of the sulphide grains and the relationship of their size and shape to the size and shape of the available pore paths
- 5. The electrode array employed
- 6. The width, depth, thickness and strike length of the mineralized body and its location relative to the array
- 7. The resistivity contrast between the mineralized body and the unmineralized host rock



The sulphide content of the underlying rocks is one of the critical factors that we would like to determine from field measurements. Experience has shown that this is both difficult and unreliable because of the large number of variables, described above, which contribute to an IP response. The problem is further complicated by the fact that rocks containing magnetite, graphite, clay minerals and variably altered rocks produce IP responses of varying amplitudes.

A detailed study has been made of the pseudo-sections which accompany this report. These pseudo-sections are not sections of the electrical properties of the sub-surface strata and cannot be treated as such when determining the depth, width and thickness of a zone which produces an anomalous pattern.

From this study the anomalies selected are shown on the individual pseudo-sections and are classified into 4 groups. These are definite, probable and possible anomalies and anomalies which have a deeper source.

This classification is based partly on the relative amplitudes of the chargeability and to a lesser degree on the resistivity response. Of equal importance in this classification is the overall anomaly pattern and the degree to which this pattern may be correlated from line to line, provided of course that the correlation is not so extensive along strike so as to most probably represent only the subcrop of a geological formation.

The IP survey detected 5 distinct zones of increased chargeability indicating the presence of a large sulphide system. For quick reference the chargeability plan map is presented as Figure 4. The 5 zones are shown in Figure 5 where the 15 millisecond contour was used as a rough guide for the boundary of the zones.

ZONE 1 is approximately 3000 metres long, up to 1200 metres wide and is centred on grid coordinates 11200N, 10200E. Chargeability values within this zone range from 15







milliseconds to over 40 milliseconds with background values in the immediate vicinity in the 6 to 11 millisecond range. The chargeability anomaly is cut by a roughly north-south dyke which trends from approximately 11500E on line 12000N to about 9750E on line 13000N. The portion of Zone 1 to the east of this dyke occurs within a resistivity low. Resistivities to the east of the dyke and immediately outside of this portion of Zone 1 are high and may be representing what has been mapped as a mineral poor granodiorite intrusion. Limited drilling in this area has produced Cu-Mo minerals with no gold credits.

About 80% of Zone 1 is to the west of the large dyke and to date has been tested by only a small number of drill holes. Results from initial drilling were encouraging in that the existence of a gold-copper mineralized porphyry system was confirmed. Furthermore a nearly 1:1 correlation of the south-eastern boundary (grid east) of Zone 1 and what has been mapped as the boundary of phyllic alteration and the transition to propylitic alteration adds credibility to the chargeability anomaly representing a porphyry system of considerable extent. This anomaly remains open to further systematic drilling over its entire length to test for continuity of its gold-copper mineralization.

The IP response over the large scale dykes on the property showed low chargeability and high resistivity. As dykes are pervasive on the Pine property it is suggested that detailed IP over the anomalous zone on 100 metre lines may be useful in delineating dykes in overburden covered areas. This would be extremely useful in making intelligent decisions with respect to locating drill holes.

ZONE 2 is to the north-east (grid-north) of Zone 1 and is centred on line 13600N at about 11200E. Chargeability values are mostly from 15 to 25 milliseconds within the zone with some values as high as 43 milliseconds on line 13600N. Resistivity values are moderately low, in the 1000 to 1200 ohm-metre range, as in most of Zone 1. A strong resistivity high separates Zone 2 from Zone 1 and may be related to the granodiorite or another large north-south trending dyke. Despite a less well defined chargeability response than that of



Zone 1 this zone has characteristics which are similar to those of Zone 1 and should not be discounted as a potential drill target.

ZONE 3 is to the north-west of Zone 1 and is centered on line 12100N at about 8400E. The higher chargeability values, 20 milliseconds and up, are coincident with a moderate resistivity low. Resistivities elsewhere within the zone are high and roughly equivalent to the surrounding background resistivity values. This anomaly remains open towards the north-east (grid north) and requires additional IP surveying to close it off providing favourable geology and encouraging results from geochemistry exist. Though the overall response of this zone is not as well defined as that of Zone 1 the area of higher chargeability values is comsidered a porphyry target and merits further exploration by drilling.

ZONE 4 is centred on line 11200N at about 8200E. It is roughly circular in shape with a diameter of about 600 metres. A distinct chargeability low separates zones 3 and 4 which may indicate a large dyke between the two zones. The chargeability response in Zone 4 is well defined and is worthy of a few test holes.

ZONE 5 is located near the south-east corner if the grid. There is a moderately strong near- surface chargeability response centred at about 11550E on line 7900N. To the west of this point anomalous values occur only on the third and fourth separations indicating a deeper source. Zone 5 remains open towards grid south and requires further IP surveying in order to close off the anomaly and to determine its lateral extent. Also if favourable geology exists at the near-surface feature then one or two drill holes are recommended to test the anomalous source at depth.



10.0 CONCLUSIONS AND RECOMMENDATIONS

The IP survey described in this report detected 5 zones of increased chargeability which are considered worthy targets for further exploration by drilling.

Zone 1

Zone 1 is the primary target on the PINE Property and to date has been tested by only a small number of drill holes. As most of this anomaly remains untested a systematic drill programme is recommended to adequately determine the true size and extent of the gold-copper mineralization. Further detail IP surveying is recommended over Zone 1 on lines 100 metres apart in an effort to delineate any large scale dykes and assist in making intelligent decisions with respect to locating drill holes.

In addition to drilling Zone 1 a total of 1650 metres in 13 holes has been recommended as initial tests of Zones 2, 3, 4 and 5.

Zone 2

To test Zone 2 the following 3 drill holes are recommended

Hole	Line No.	Station No.	Dip	Length (metres)
1	13600N	11200E	Vertical	135
2	13600N	11050E	Vertical	135
3	13600N	11300E	Vertical	135



Zone 3

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To test this Zone the following holes are recommended:

Hole	Line No.	Station No.	Dip	Length (metres)
4	12100N	8300E	Vertical	135
5	12100N	8400E	Vertical	135
6	12100N	8200E	Vertical	135
7	12400N	8300E	Vertical	135
8	12400N	8400E	Vertical	135

This zone remains open to the north east. If favourable geology exists then additional IP is recommended to close off the anomaly and determine its extent.

Zone 4

Zone 4 exhibits a well defined anomaly and merits the following test holes:

Hole	Line No.	Station No.	Dip	Length (metres)
9	11200N	8200E	Vertical	100
10	11200N	8300E	Vertical	100
11	11200N	8100E	Vertical	100

If encouraging results are obtained in these initial test holes then step out drilling towards grid south on 100 metre centres is recommended.



Zone 5

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Chargeabilities here for the most part indicate a source at depth. Based on the IP data the following holes are recommended to test the near surface anomaly:

Hole	Line No.	Station No.	Dip	Length (metres)
12	7900N	11600E	Vertical	135
13	7900N	11500E	Vertical	135

If favourable results are obtained from these test holes then step out drilling is recommended to test the deeper target as well as additional IP surveying to close off the anomaly towards grid south.

> Respectfully Submitted, LLOYD GEOPHYSICS INC.

Dim hloyd

John Lloyd, M.Sc., P.Eng. Geophysicist

Daniel a Kt

Daniel A. Klit, B.Sc. Geophysicist



APPENDICES

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APPENDIX A

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Personnel Employed on Survey

Name	Occupation	Address	Dates
J Lloyd	Geophysicist	1503-1166 Alberni Street Vancouver, B.C. V6E 3Z3	Nov 13/92
D Klit	Geophysicist	ff	Aug 2-Sept 2/92 Nov 9-12/92
H Martin	Helper	u	Aug 2-11/92
R Wheater	Helper	n	Aug 2-25/92
I Campbell	Helper	n	Aug 2-25/92
K Wright	Helper	n	Aug 2-25/92
J Perry	Helper	T	Aug 11-Sept 2/92
C Bilquist	Geophysical Technician	n	Aug 25-Sept 2/92
J Twomey	Helper	n	Aug 25-Sept 2/92



APPENDIX B

Cost of Surveying and Reporting

Lloyd Geophysics Inc. contracted the IP data acquisition on a per diem basis. Mobilization/ Demobilization, truck rental, data processing, computer plotting, map reproduction, interpretation and report writing were additional costs. The breakdown of these costs was as follows:

Mobilization/Demobilization	\$ 3,593.72	
Truck Charges	2,474.83	
Living & Travelling Expenses	243.89	
Data Acquisition	38,250.00	
Data Processing & Computer Plotting	908.86	
Consumables & Reproduction Costs	880.24	
Interpretation & Report Writing	1,650.00	
Sub-Total	\$ 48,001.56	
G.S.T. @ 7%	3,360.12	
TOTAL	\$ <u>51,361.68</u>	



APPENDIX C

Certification of Senior Author

I, John Lloyd, of 1503-1166 Alberni Street, in the City of Vancouver, in the Province of British Columbia, do hereby certify that:

- 1. I graduated from the University of Liverpool, England in 1960 with a B.Sc. in Physics and Geology, Geophysics Option.
- I obtained the diploma of the Imperial College of Science and Technology (D.I.C.), in Applied Geophysics from the Royal School of Mines, London University in 1961.
- 3. I obtained the degree of M.Sc. in Geophysics from the Royal School of Mines, London University in 1962.
- 4. I am a member in good standing of the Association of Professional Engineers in the Province of British Columbia, the Society of Exploration Geophysicists of America, the European Association of Exploration Geophysicists and the Canadian Institute of Mining and Metallurgy.
- 5. I have been practising my profession for over twenty-five years.

Vancouver, B.C. September, 1992





				MILL I I VI	
NT	ELECTRODE	E EAST O	F PO	TENTIAL	DIPOL
	CONTO	UR INTE	ERVA	LS	
	-		2.5	MSEC	
			10.0	MSEC	
			40.0	MSEC	

