GEOPHYSICAL SURVEY REPORT

ON THE

NOBLE 1-12 CLAIMS

KAMLOOPS MINING DIVISION

Latitude 51° 38' N, Longtitude 119° 48' W

NTS 82-M-12-E

Owner: Placer Dome Inc.
Operator: Placer Dome Inc.

R.W. Cannon, P. Eng.

October, 1989

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF PLATES

SUMMARY

Induced Polarization and Resistivity surveys (I.P.) were conducted along 26.64 km of line on two grids (McCorvie and SSR Grids). Magnetometer and two station VLF-EM surveys were conducted on the McCorvie grid while only a magnetometer survey was carried out on the SSR grid.

These surveys were of assistance in the geologic mapping and the interpretation of trends in the geochemical soil survey. Several of the rock units show up as resistivity lows and chargeability highs. The VLF-EM survey was able to map the geologic contacts while the magnetometer survey outlined a zone of lows which correlated with a geochemical anomaly.

INTRODUCTION

Induced Polarization and Resistivity surveys were conducted over portions of the Noble claims, Clearwater Area, British Columbia, during the period June 8 to 21, 1989. The work was carried out by Scott Geophysics Ltd. on behalf of Placer Dome Inc.

The dipole-dipole electrode array was used on the survey, with readings taken at an "a" spacing of 40 metres and "n" separations of 1 to 5. For the McCorvie grid, the current electrodes were located to the east of the potential electrodes and the traverse direction was to the west. On the SSR grid, the current electrodes were located to the south of the potential electrodes on lines 6800E, the north portion of lines 7300E and 7500E, and lines 7700E to 8700E, with the traverse direction to the north. On all other lines for the SSR grid, the current electrodes were located to the north and the traverse direction was to the south. In areas of low resistivities, it was sometimes not possible to obtain readings at the further spacings and such data has been eliminated from the records.

The magnetometer and VLF-EM surveys were conducted by Placer Dome Inc. and were carried out during the period June 10 to 14, 1989. Approximately 46 km of magnetometer survey was performed on the SSR grid. On the McCorvie grid, 8.92 km of magnetometer and two station VLF-EM surveys were performed.

LOCATION AND ACCESS

The Noble claims are located on the south flank of Mount McClennan, some 15 kilometres east of Clearwater, British Columbia. Access to the survey area is by the McCorvie Lake logging road from Highway No. 5, approximately 4 kilometres east of Birch Island.

PROPERTY STATUS

The property consists of 12 claims comprising 132 units which are as follows:

NAME	UNITS	RECORD NO.	EXPIRY DATE
Noble 1	12	4388	March 30, 1999
Noble 2	20	4389	March 30, 1999
Noble 3	20	4390	March 30, 1995
Noble 4	20	4391	March 30, 1996
Noble 5	15	4392	March 30, 1996

NAME	UNITS	RECORD NO.	EXPIRY DATE
Noble 6	20	4561	June 27, 1999
Noble 7	20	7954	August 10, 1999
Noble 8	1	7986	August 24, 1999
Noble 9	1	7987	August 24, 1999
Noble 10	1	7988	August 24, 1999
Noble 11	1	7989	August 24, 1999
Noble 12	1	7990	August 24, 1999

PREVIOUS WORK

The Redtop, Snow and Sunrise showings were first discovered in the early 1920's. A considerable amount of work was conducted then and in the 1940's, 1960's and 1970's. Placer Development Ltd. carried out exploration programmes between 1983 and 1986.

Previous work on the property included line cutting, trenching, geochemical soil sampling, VLF-EM surveys, magnetometer surveys and diamond drilling. During 1988, Placer Dome Inc. cut a new grid and had a UTEM survey performed by S.J.V. Consultants Ltd. of Delta, British Columbia. This survey was followed up by geological mapping, sampling and the drilling of four NQ diamond drill holes. A limited I.P. survey was conducted by Scott Geophysics Ltd. on the grid as well as I.P. logging of the drill holes.

GEOLOGY

The Noble property is mainly underlain by Cambrian to Devonian?, Eagle Bay strata; commonly low grade metavolcanics and sediments. The sequence includes a variety of limestones and carbonate rich sediments. Mineralization generally occurs along a sericite-quartz schist/limestone or limy schist interface near the axis on the north flank of an east-west trending antiform structure.

GEOPHYSICAL SURVEYS

Induced Polarization

A total of 26.64 line km were surveyed on the Noble property with 6.66 km being on the McCorvie grid and 20.04 km on the main SSR grid. The survey on the SSR tied on to the work done in 1988 and greatly expanded the coverage. The data was gathered using the dipole-dipole electrode array, an "a" spacing of 40 m and "n" separations of 1-5. The transmitted waveform was the standard two second alternating square wave with the transmitting and receiving electrode positions as mentioned in the introduction above.

Magnetometer/VLF-EM

VLF -EM and magnetometer surveys were conducted along 8.92 and 54.92 kilometres of line respectively. The VLF survey utilized transmitting stations at Seattle, Washington and Lualualei Hawaii. The signal from Lualualei was notably weaker than that of Seattle and was often more difficult to null. The signal from Seattle was from azimuth 200^{o} while the signal from Lualualei was from azimuth 235^{o}. Therefore readings were taken every 20 m facing Az. 110^{o} and Az. 145^{o} respectively.

Magnetometer readings were taken at 10 m intervals and corrections for drift and diurnal changes were made by use of a base station recording magnetometer.

INSTRUMENTATION AND PROCEDURES

Induced Polarization

A Scintrex IPR-11 time domain, microprocessor based receiver and a Scintrex 10 kW TSQ-4 transmitter were used for the Induced Polarization survey. Readings were taken using a two second alternating square wave. The chargeability for channel 8 (690 to 1050 milliseconds after shut off; midpoint at 870 milliseconds) is the value that has been plotted on the accompanying plans and pseudosections.

The survey data was put in archive, processed and plotted using a Sharp PC7000 microcomputer running Scintrex Soft II, IGS and proprietary software. All chargeability values were analyzed for their spectral characteristics using a curve matching procedure (Soft II). The Cole-Cole parameters, "c" and "tau" were calculated along with a goodness-of-fit. This fit parameter is a measure of the variability or homogeneity of the "grain" size.

Magnetometer

The magnetometer survey was conducted using two Geometrics G-856A portable proton magnetometers (memory-mags). One was used in the field mode while the other was used in a base station mode. The internal clocks were synchronized before commencement of the survey and subsequent daily readings were dumped out onto a Zenith microcomputer. The data from the two magnetometers was merged and corrected for diurnal drift from an established base station value. The corrected results were plotted as field profiles and also stored on disk for eventual transfer to a Sun Microsystems work station for final plotting.

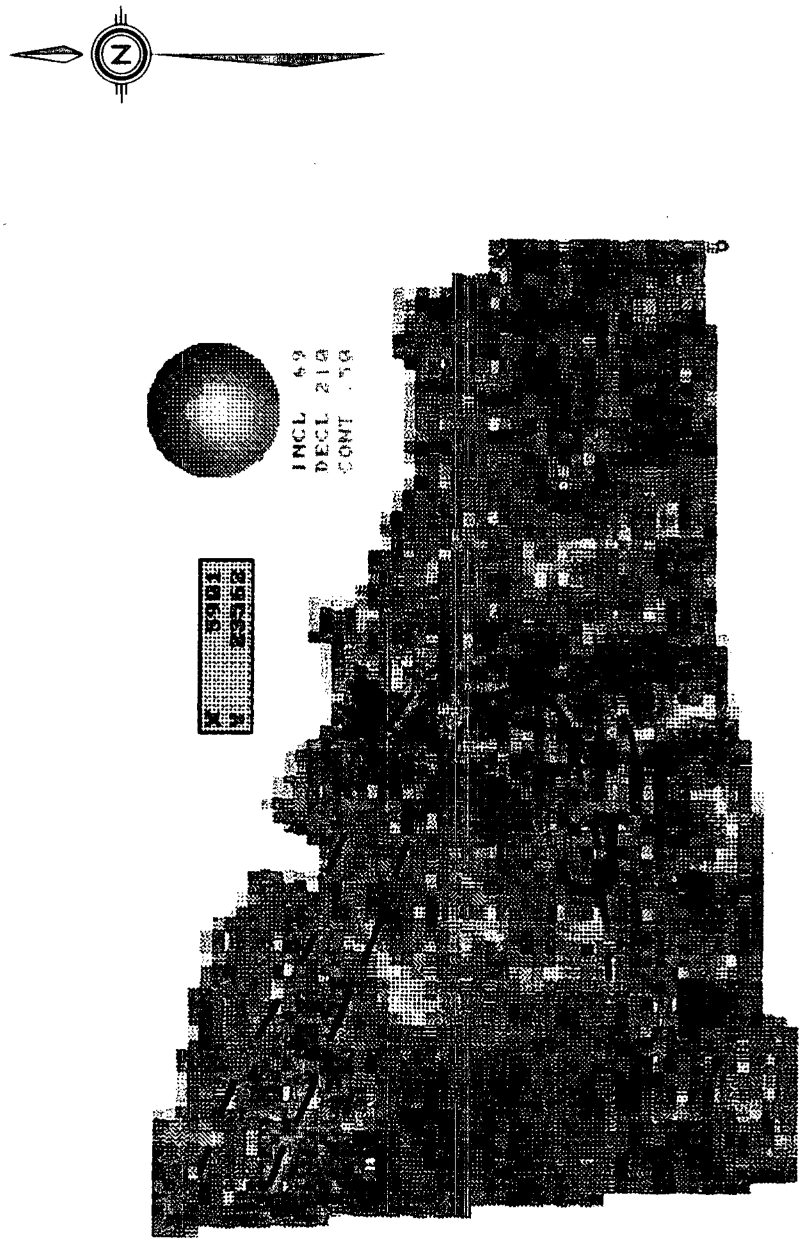
VLF-EM

The VLF-EM survey employed a Geonics EM-16 which used the Seattle and Lualualei transmitting stations. VLF readings were also entered onto the Zenith portable computer and plots were made of the In-phase, Quadrature and Fraser Filter data. The stored data was transferred to a Sun Microsystems work station for final processing and plotting.

SURVEY RESULTS

Resistivity and chargeability data for slice M7 (channel 8) are presented as pseudosections in Appendix I at the back of this report (scale 1:5000). Contoured plan maps of the above data are enclosed in the pockets at the back of this report. They have been combined with the results from last year for the SSR grid.

The magnetometer survey results were plotted as plan maps of stacked profiles and contoured data at scales of 1:5000 (see plates in folder at back of report).



POSSIBLE FOLD TREND DEFINED
BY MAGNETIC LOWS.

RTI SHADOW PLOT (MAGNETIC DATA)

FIGURE 3

The VLF-EM survey results were plotted as stacked In-phase, Quadrature and Fraser Filter profiles on a plan map at a scale of 1:5000. The Fraser Filter data was calculated as per the method put forth by D.C. Fraser (1969, Contouring of VLF-EM data: Geophysics, v.34, p. 958-967). See plate in the folder at the back of report.

DISCUSSION OF RESULTS

Induced Polarization

The Induced Polarization and Resistivity survey results show the east and west sides of the McCorvie grid to be underlain by rocks which have extremely low resistivities and high chargeabilities. These rocks are most likely graphitic in content. Chargeability highs were detected over much of the SSR or Main grid and are indicative of pervasive pyrite mineralization. Only the fine grained meta-sediments (phyllite) have low chargeabilities.

Magnetics

The magnetometer survey on the McCorvie grid showed general low magnetic effects except for a good dipole on line 30400 N at 29850 E. The RTI shadow plots of the main zone magnetics revealed that several of the beds could be traced along both limbs of the plunging anticline (see Figure 3). This system is explained in Appendix III.

VLF-EM

The VLF-EM survey on the McCorvie Grid, using two stations, detected the contacts between the low resistivity graphitic units and the more resistive unit which trends north-south through the centre of this grid. Both stations detected the same conductor axes.

CONCLUSIONS AND RECOMMENDATIONS

It was concluded that I.P. method was useful in mapping out the graphitic units on the McCorvie grid but was less useful in distinguishing between units on the main grid because of the pervasive pyrite mineralization. It was also concluded that the magnetometer and VLF-EM surveys were of use in mapping the stratigraphy and structures present on the property.

It is recommended that in areas of positive geochemical response, detailed magnetometer and VLF-EM surveys should be conducted.

R.W. Cannon, P.Eng.

R. W. Cannon, P. Eng.

STATEMENT OF QUALIFICATIONS

I, Richard W. Cannon, of the City of Vancouver, Province of British Columbia, hereby certify as follows:

1. I am a graduate of the University of British Columbia where I received a B. A. Sc. in Geological Engineering (Geophysics Option) in May, 1966.
2. I am a member of the Association of Professional Engineers of British Columbia and have been so since 1968. Registration No. 6742.
3. I am a member of the Canadian Institute of Mining and Metallurgy, Society of Exploration Geophysicists, and the B. C. Geophysical Society.
4. I have practised my profession since 1966.

Respectfully Submitted,

RW Cannon, P. Eng.

R. W. Cannon, P. Eng.

STATEMENT OF EXPENDITURES FOR GEOPHYSICS
NOBLE PROJECT

<u>Magnetometer and VLF-EM Survey</u>

1)	**LABOUR COST**		
	H. Letient - Geophysicist 5 days @ $225/day	$	1,125.00
	K. Everard - Geophysicist 5 days @ $225/day	$	1,125.00
2)	**CAMP COST**		
	10 person days @ $60/day	$	600.00
3)	**TRANSPORTATION**		
	4X4 Truck lease 5/30 X $800/month	$	133.33
	Fuel and maintenance 5 days @ $10/day	$	50.00
4)	**EQUIPMENT CHARGES**		
	2 G-856 Magnetometers @ $400/week X 1	$	400.00
	1 Zenith laptop computer @ $100/week X 1	$	100.00
	1 Geonics EM-16 @ $200/week X 1	$	200.00
5)	**REPORT PREPARATION**		
	R. Cannon 8 days @ $410/day	$	3,280.00

<u>Induced Polarization Survey</u>

1)	**I.P. SURVEY as per SCOTT GEOPHYSICS LTD.**		
	INVOICE	$	22,443.25
	TOTAL	**$**	**29,456.58**

APPENDIX I

I.P. Pseudosections

APPENDIX II

I.P. Anomaly Description

APPENDIX II

MCCORVIE GRID

LINE	DESCRIPTION
L 28600 N	Strong chargeability anomaly from 29740 E to 29900 E with associated resistivity low. Open to west.
L 28800 N	Same as above from 29660 E to 29860 E and open to west.
L 29000 N	Strong chargeability anomaly from 29666 E to 29840 E with associated low resistivity.
L 29200 N	Two zones 29740 E to 29860 E, open to west and 30200 E to 30300 E, open to east. High chargeability with associated low resistivity.
L 29400 N	Two zones 29740 E to 29900 E, open to west and 30180 E to 30220 E, open to east. High chargeability with associated resistivity low. Both zones appear to connect at depth.
L 29600 N	Chargeability high for entire line with two resistivity lows 29745 E to 29940 E and 30200 E to 30300 E, open to east.
L 29800 N	Chargeability high from 29740 E to 30300 E with resistivity lows at 29860 E to 29940 E and 30180 E to 30300 E, open to east. Lows are connected at depth.
L 30000 N	Chargeability high from 29748 E to 30300 E, open to east. Two resistivity lows from 29826 E to 29980 E and 30100 E to 30300 E, open to east. Resistivity lows connected from 29900 E to east.
L 30200 N	Chargeability high for entire line and resistivity low from 29800 E to 30020 E.
L 30400 N	Resistivity low from 29750 E to 30000 E. Chargeability high from 29720 E to 30240 E.
L 30600 N	Resistivity low and chargeability high from 29730 E to 29840 E and from 30120 E to 30240 E.

SSR GRID

LINE	DESCRIPTION
L 5500 E	Chargeability high from 6280 N to 6560 N, open to north. Strongest from 6400 N to 6480 N.

L 5600 E	Chargeability high from 6170 N to 6560 N, open to north.
L 5700 E	Chargeability high from 6160 N to 6580 N, open to north.
L 5800 E	Chargeability high from 6160 N to 6400 N, open to north.
L 5900 E	Chargeability high from 6240 N to 6480 N, open to north.
L 6000 E	Chargeability high from 6100 N to 6360 N, open to north.
L 6100 E	Chargeability high from 6040 N to 6380 N, open to north.
L 6200 E	Chargeability high from 6000 N to 6260 N, open to north.
L 6300 E	Chargeability highs from 4500 N to 5200 N and at depth from 5800 N to 6280 N, open to north.
L 6400 E	Chargeability high at depth from 5720 N to 6160 N, open to north.
L 6500 E	Chargeability highs from 4540 N to 4720 N, 4820 N to 5020 N, and 5220 N to 6100 N, open to north.
L 6600 E	Chargeability high for entire line.
L 6700 E	Chargeability high from 4580 N to 5970 N, open to north.
L 6800 E	Chargeability high from 5480 N to 5890 N, open to north.
L 6900 E	Chargeability high from 4580 N to 5800 N, open to north.
L 7100 E	Chargeability high from 4560 N to 5720 N, open to north.
L 7300 E	Chargeability high from 4700 N to 5600 N, open to north.
L 7500 E	Chargeability highs from 4364 N to 4404 N and 4670 N to 5600 N, open to north.
L 7700 E	Chargeability high for entire line.
L 7900 E	Chargeability high for entire line.
L 8200 E	Chargeability high for entire line.
L 8300 E	Chargeability high for entire line.
L 8400 E	Chargeability high for entire line.
L 8600 E	Chargeability high for entire line.
L 8700 E	Chargeability high for entire line.

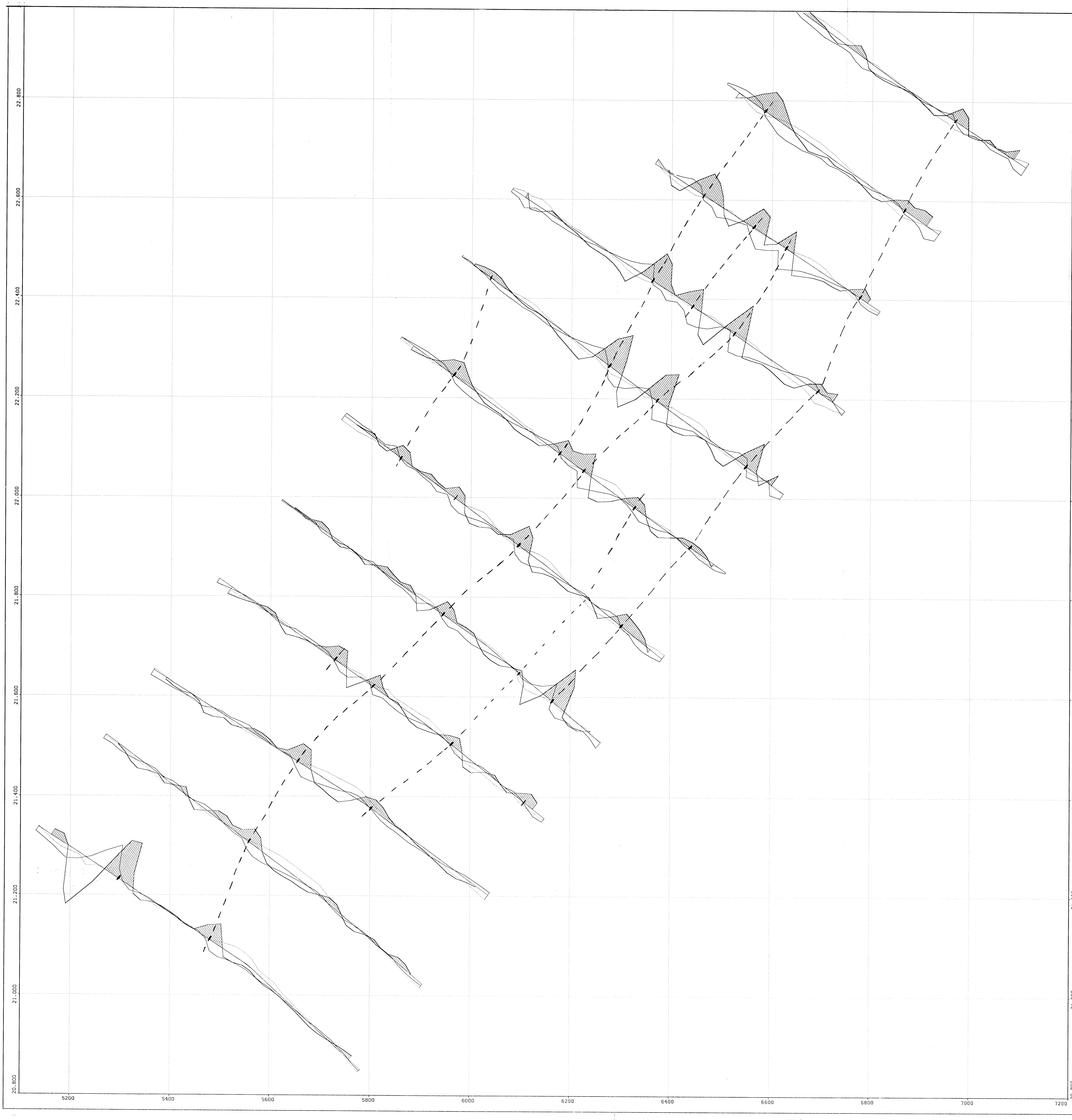
APPENDIX III

RTI Description

RTI Processing Package

"Real Time Imaging (RTI) is a state of the art, 256 colour VGA processing package developed by Geopak Systems, the software division of Urquhart-Dvorak Limited, in association with Aerodat Limited. The RTI package greatly assists comprehensive data interpretation through the use of high speed algorithms and screen drivers. It requires any XT, AT or 386 computer with extended high resolution VGA capability and a math coprocessor. Gridded (digital) geophysical data or its derivatives may be manipulated interactively on screen, either singulary or in stacked multiple grid format, by a mouse driven interface.

Colour or grey shadow displays of survey data may be varied according to selected colour tones and contrast. Inclination and declination of the "sun angle" in shadow mapping may be varied in real time (i.e. as the cursor moves - driven by the mouse - so does the apparent shadow produced by the "sun"). The on-screen image is three dimensional in nature and gives a pseudo topographic view of the data set. Controlled changes in the "sun angle" greatly enhance structural features, geological contacts and lithologic changes, and assist the interpreter (user) in identifying subtle trends not readily apparent in the hard copy map products usually associated with geophysical data."



CONDUCTOR AXES

LIGHT LINE = QUADRATURE

MEDIUM LINE = IN-PHASE

DARK LINE = FRASER FILTER

READINGS TAKEN FACING 110° AZ.

TX. STATION - SEATTLE, WASHINGTON

DATA PLOTTED ON THIS MAP:
DIRECTORY: $EXPL/NOBLE/GP

FIELD	FILE	
IP	SEAIP.UTM	SCALE: 40.0 UNITS / CM; BASE LEVEL: 0.0
QD	SEAQD.UTM	SCALE: 40.0 UNITS / CM; BASE LEVEL: 0.0
FF	SEAFF.UTM	SCALE: 40.0 UNITS / CM; BASE LEVEL: 0.0

GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,019

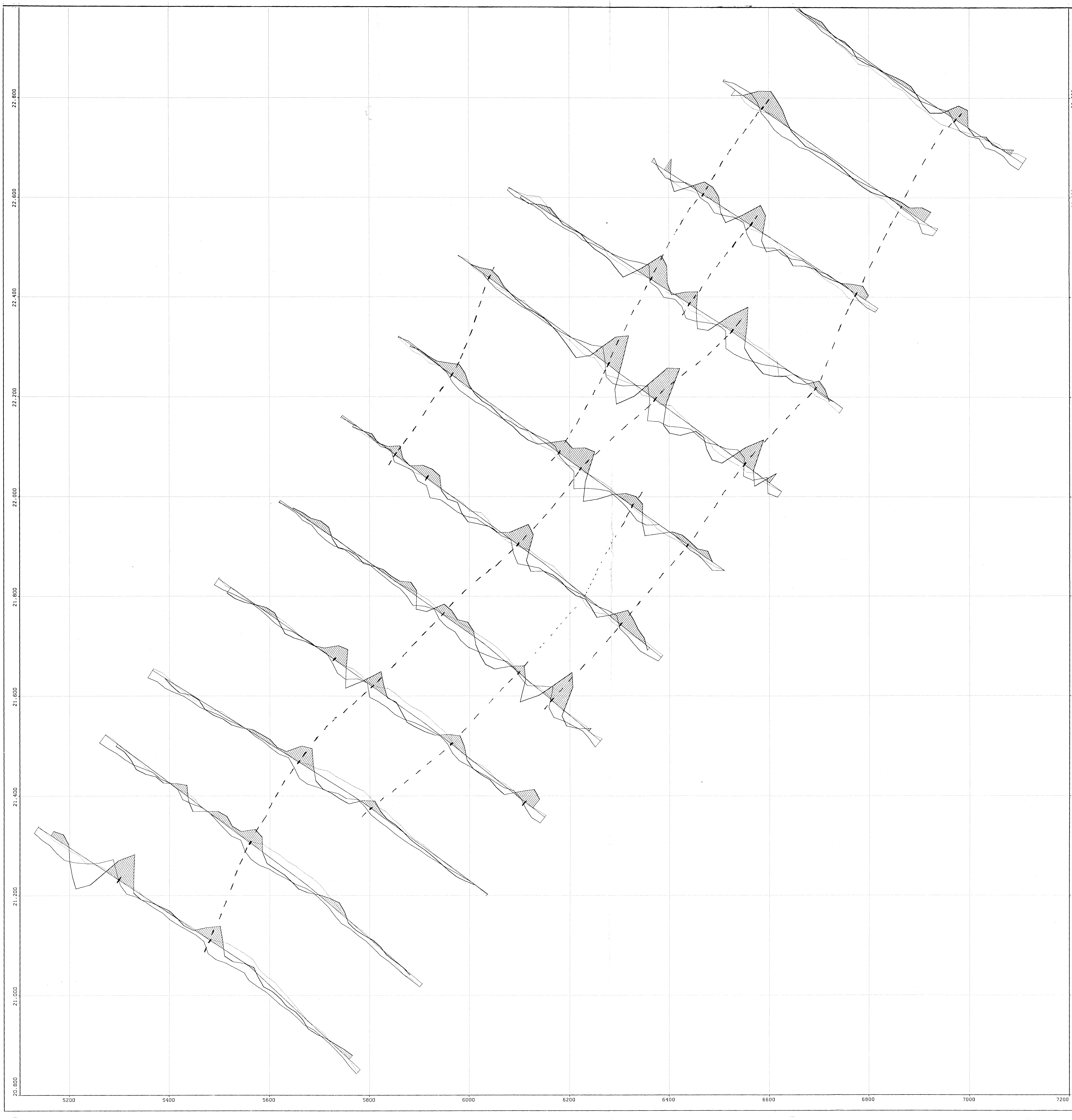
N

Part 3 of 3

0 100 200 300
METRES

PLACER DOME INC.

DRAWN RWC	NOBLE PROJECT-MCCORVIE GRID
DATE 89:11:28	STACKED VLF PROFILES-SEATTLE
SCALE 1:2500	
	NO. PLATE 007



— — — CONDUCTOR AXES

LIGHT LINE = QUADRATURE

MEDIUM LINE = IN-PHASE

DARK LINE = FRASER FILTER

READINGS TAKEN FACING 145° AZ

TX. STATION - LUALUALEI, HAWAII

DATA PLOTTED ON THIS MAP:
DIRECTORY: $EXPL/NOBLE/GP

FIELD	FILE	
IP	HAWIP.UTM	
SCALE:	40.0 UNITS / CM	
BASE LEVEL:	0.0	
QD	HAWQD.UTM	
SCALE:	40.0 UNITS / CM	
BASE LEVEL:	0.0	
FF	HAWFF.UTM	
SCALE:	40.0 UNITS / CM	
BASE LEVEL:	0.0	

GEOLOGICAL BRANCH ASSESSMENT REPORT

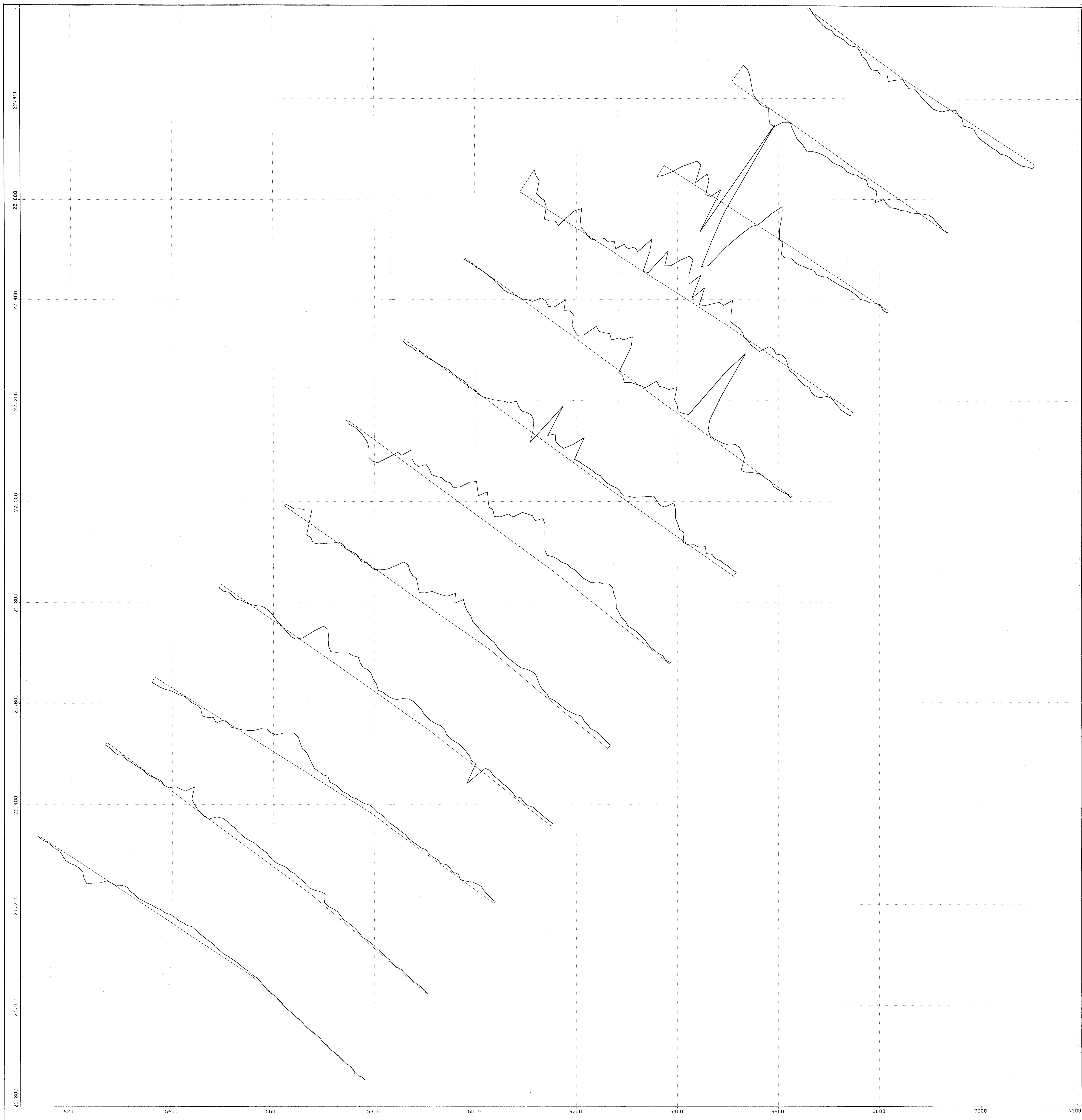
20,019

N

Part 3 of 3

0 100 200 300
METRES

PLACER DOME INC.	
DRAWN RWC	NOBLE PROJECT-MCCORVIE GRID
DATE 89:11:28	STACKED VLF PROFILES-LUALUALEI
SCALE 1:2500	
	NO. PLATE 006



UNITS = NANOTESLAS

DATA PLOTTED ON THIS MAP:
DIRECTORY: %EXPL/NOBLE/GP

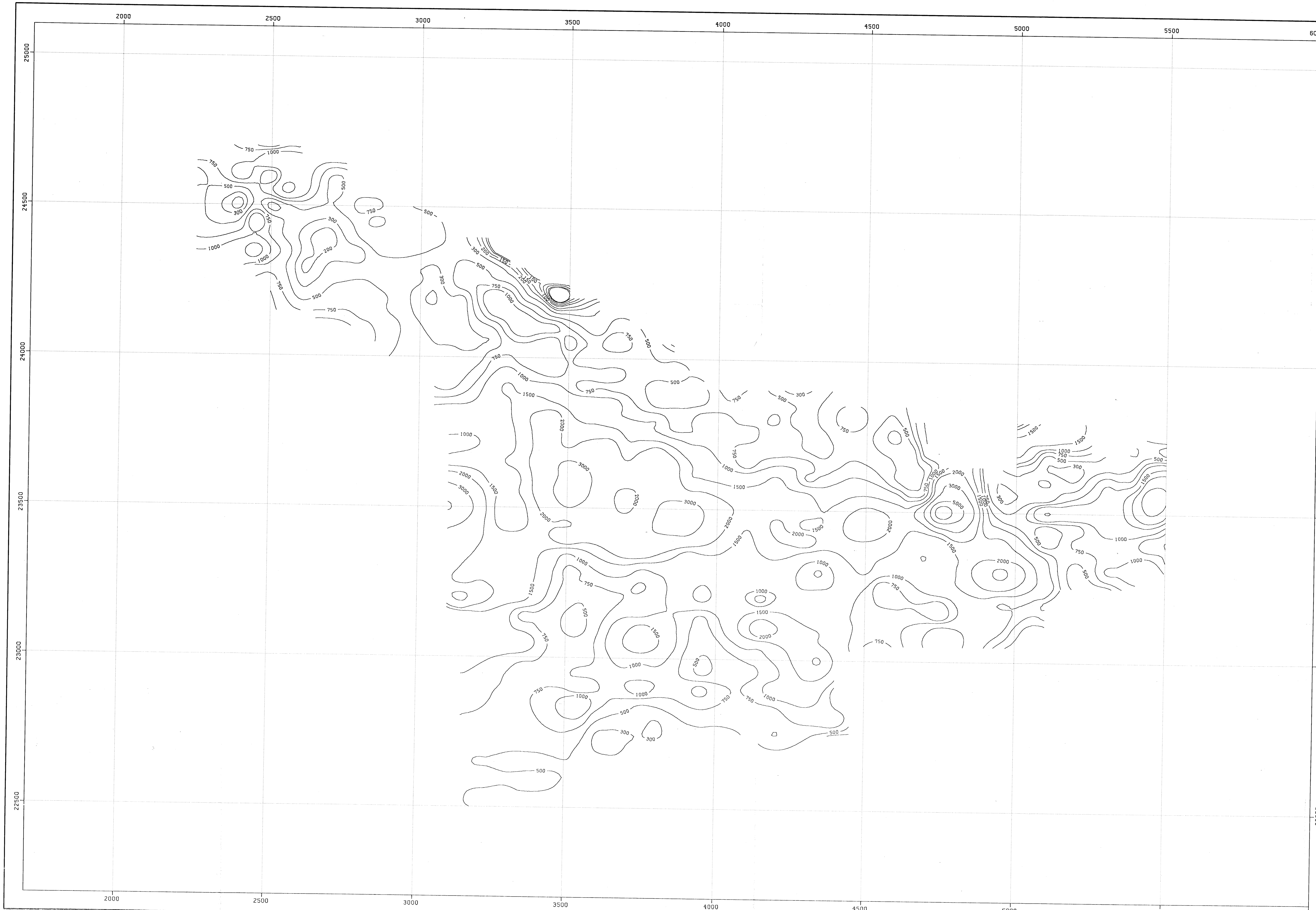
FIELD FILE
MAG MCCMAG.UTM
SCALE: 200 UNITS / CM
BASE LEVEL: 57700

GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,019
Part 3 of 3

0 100 200 300
METRES

PLACER DOME INC.	
DRAWN RWC	NOBLE PROJECT-MCCORVIE GRID
DATE 89:11:28	STACKED MAGNETIC PROFILES
SCALE 1:2500	
	NO. PLATE 005



NOBLE PROJECT - SSR GRID
CONTOURED RESISTIVITY N=1

UNITS = OHM-METRES

DATA PLOTTED ON THIS MAP:
DIRECTORY: /PLACER1_1E/EXPL/NOBLE/GP/IP89

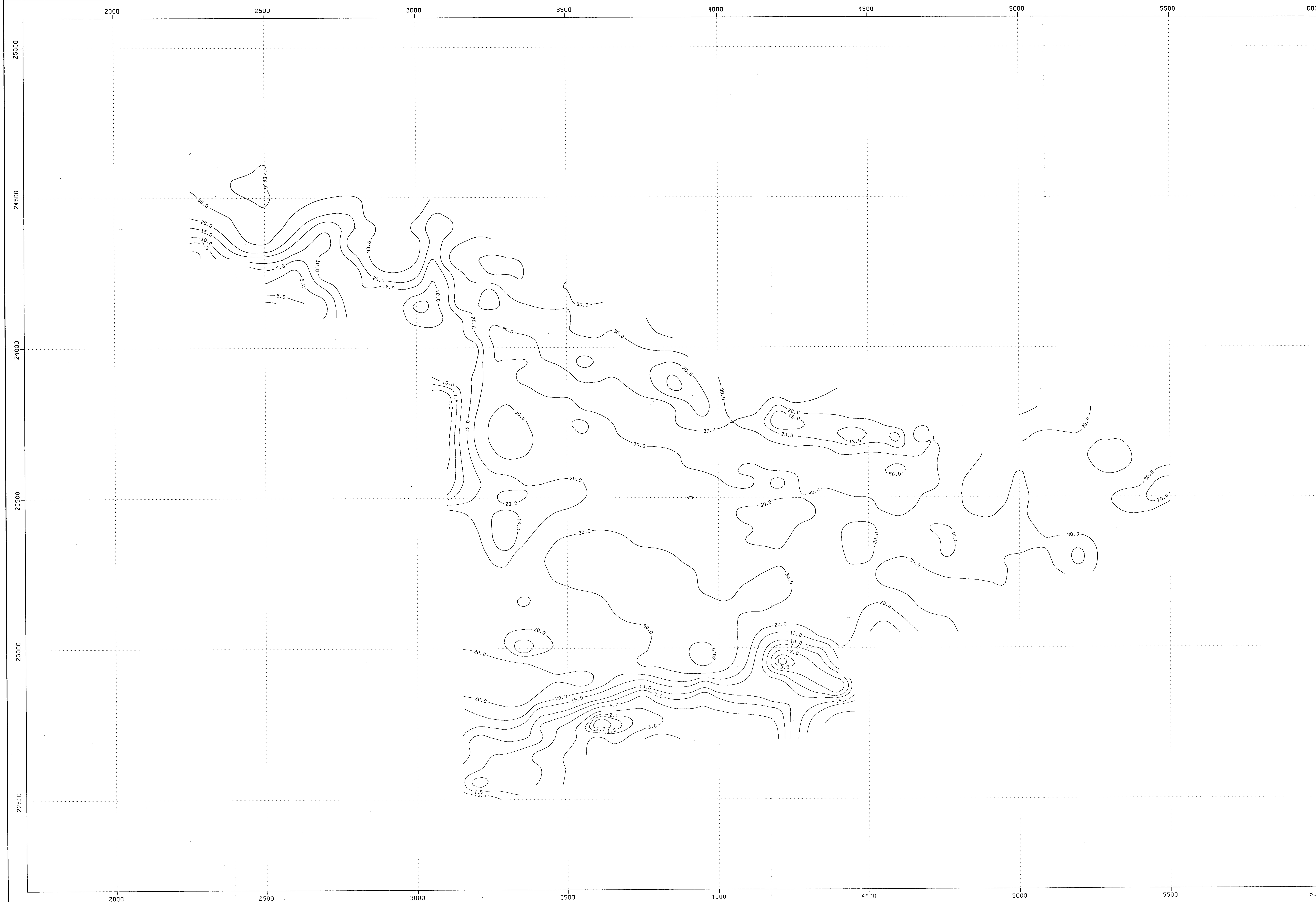
	FIELD	FILE
CONTOURS:	RES.	NOBLE1E01.GRD

GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,019
Part 3 of 3

0 200 400 600
METRES

PLACER DOME INC.	
DRAWN RWC	NOBLE PROJECT - SSR GRID CONTOURED RESISTIVITY N=1
DATE 89:11:28	
SCALE 1:5000	
	NO. PLATE 004



NOBLE PROJECT - SSR GRID
CONTOURED CHARGEABILITY N=1

UNITS = MILLISECONDS

DATA PLOTTED ON THIS MAP:
DIRECTORY: /PLACER1_IE/EXPL/NOBLE/GP/IP89

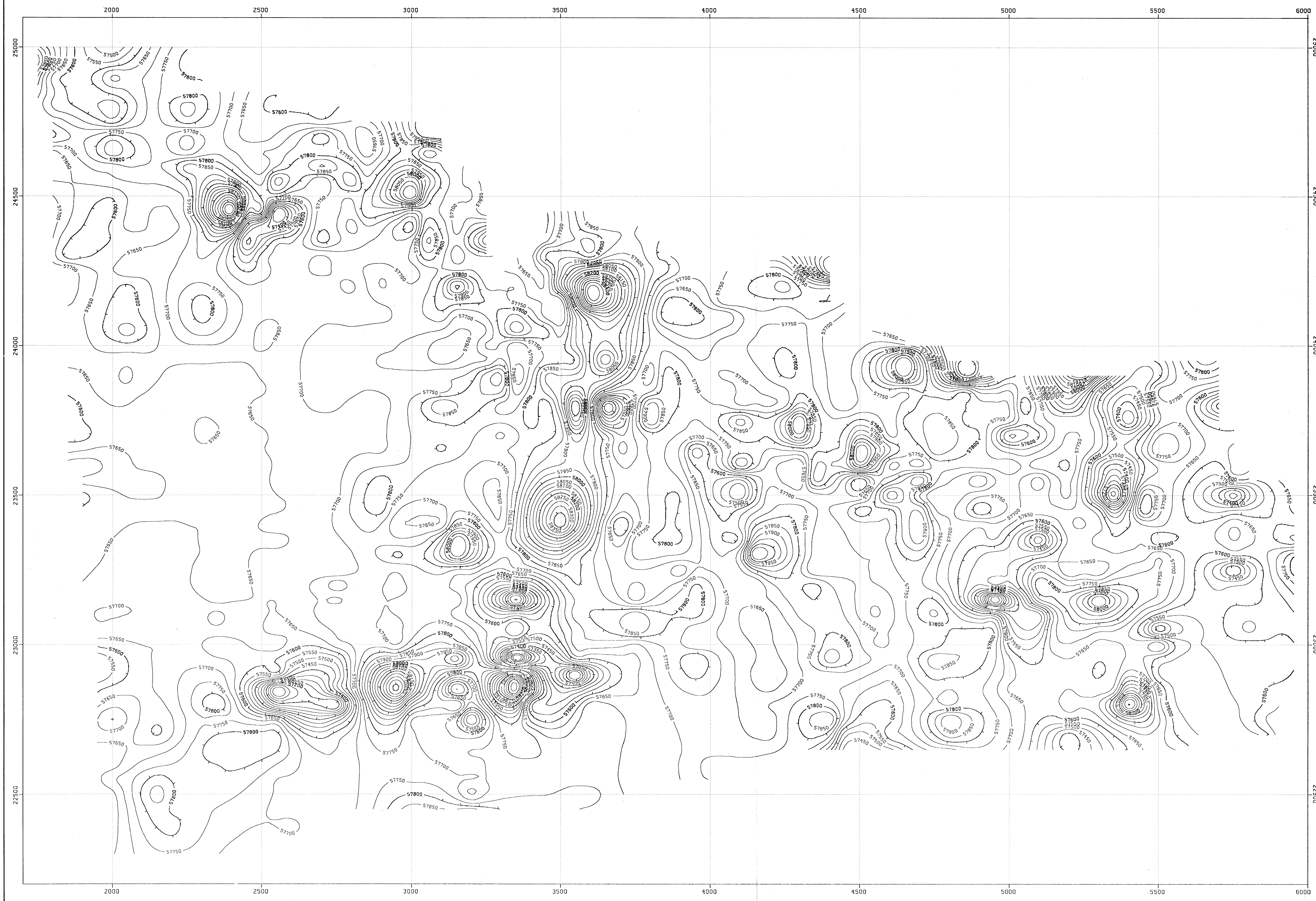
	FIELD	FILE
CONTOURS:	M7	NOBLEIM7.GRD

GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,019
Part 3 of 3

0 200 400 600
METRES

PLACER DOME INC.	
DRAWN RWC	NOBLE PROJECT - SSR GRID
DATE 89:11:28	CONTOURED CHARGEABILITY N=1
SCALE 1:5000	
	NO. PLATE 003



NOBLE PROJECT - SSR GRID
CONTOURED MAGNETIC DATA

UNITS = NANOTESLAS

DATA HAS BEEN UPWARD CONTINUED 10 M

DATA PLOTTED ON THIS MAP:
DIRECTORY: /PLACER1_1E/EXPL/NOBLE/GP

	FIELD	FILE
CONTOURS:	MAG	NOBLEMAGUP.GRD

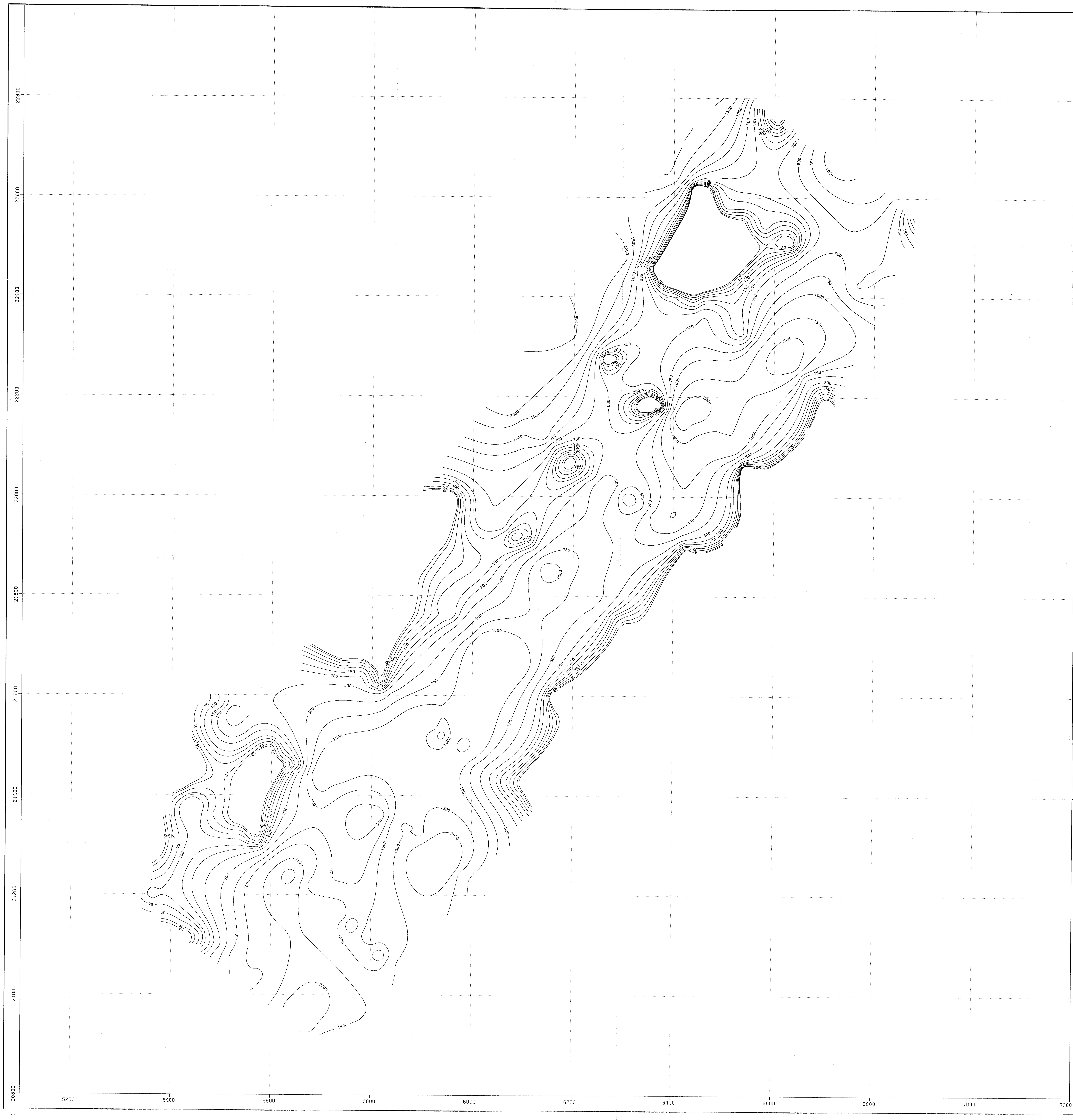
GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,019
Part 3 of 3

0 200 400 600
METRES

PLACER DOME INC.	
DRAWN RWC	NOBLE PROJECT - SSR GRID
DATE 89:11:28	CONTOURED MAGNETIC DATA
SCALE 1:5000	
	NO. PLATE 002


NOBLE PROJECT - SSR GRID
STACKED MAGNETIC PROFILES
UNITS = NANOTESLAS
DATA PLOTTED ON THIS MAP:
DIRECTORY: $EXPL/NOBLE/GP
FIELD FILE
MAG NOBLEMAG.UTM
SCALE: 500 UNITS / CM
BASE LEVEL: 57700
GEOLOGICAL BRANCH
ASSESSMENT REPORT
20,019
Part 3 of 3
0 200 400 600
METRES
PLACER DOME INC.
DRAWN RWC
DATE 89:11:28
SCALE 1:5000
NOBLE PROJECT - SSR GRID
STACKED MAGNETIC PROFILES
NO.
PLATE 001



UNITS = OHM-METRES

DATA PLOTTED ON THIS MAP:
DIRECTORY: /PLACER1_1E/EXPL/NOBLE/GP/IP89

FIELD FILE
CONTOURS: RES.

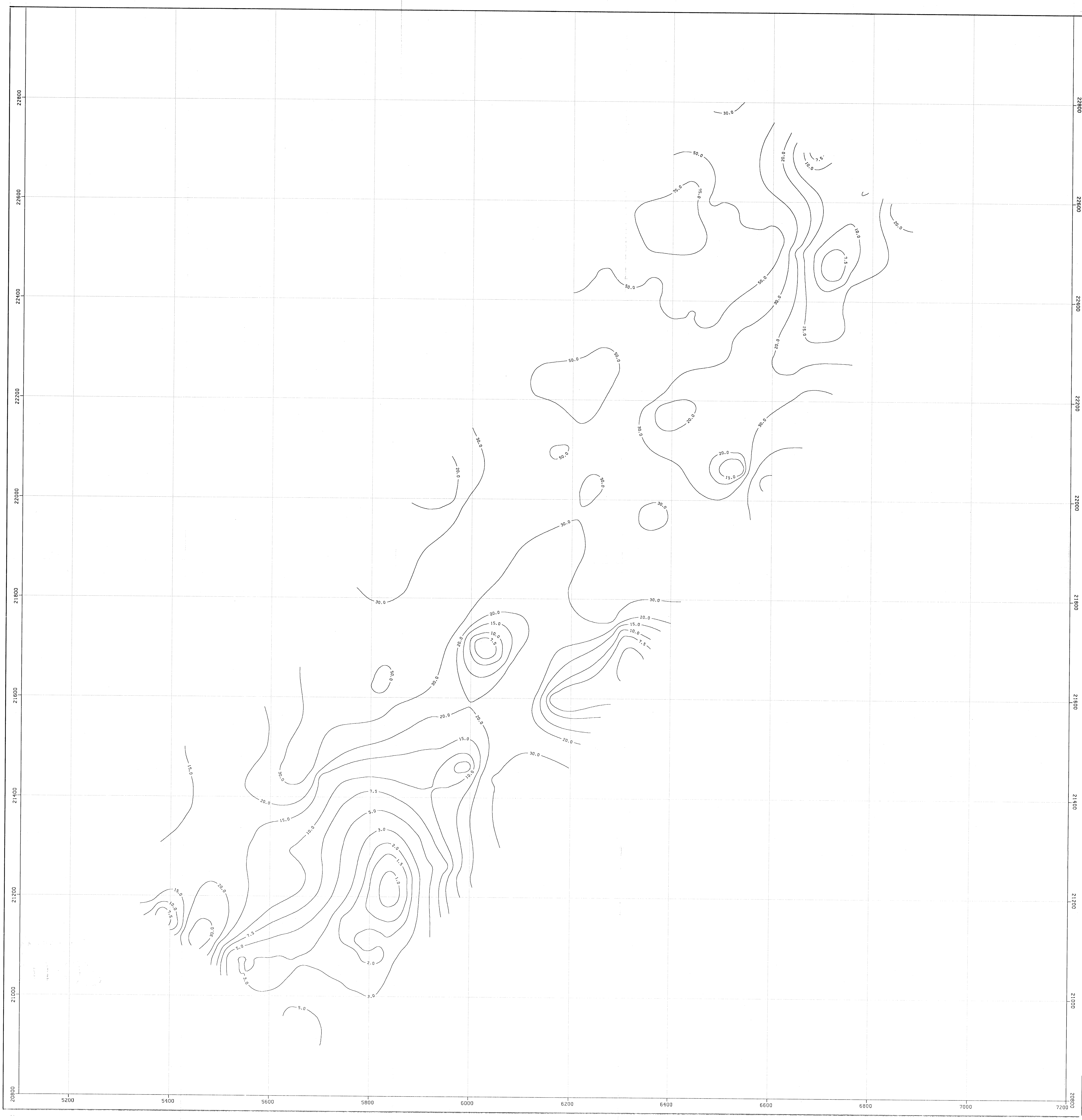
GEOLOGICAL BRANCH
ASSESSMENT REPORT

20,019

Part 3 of 3

0 100 200 300
METRES

PLACER DOME INC.	
DRAWN RWC	NOBLE PROJECT - MCCORVIE GRID CONTOURED RESISTIVITY N=1
DATE 89:11:28	
SCALE 1:2500	
	NO. PLATE 009



GEOLOGICAL BRANCH
ASSESSMENT REPORT

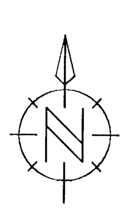
20,019

Part 3 of 3

UNITS = MILLISECONDS

DATA PLOTTED ON THIS MAP:
DIRECTORY: /PLACER1_1E/EXPL/NOBLE/GP/IP89

	FIELD	FILE
CONTOURS:	M7	MCCORVIE1M7.GRD



PLACER DOME INC.

DRAWN RWC	NOBLE PROJECT - MCCORVIE GRID
DATE 89:11:28	CONTOURED CHARGEABILITY N=1
SCALE 1:2500	
	NO. PLATE 008