Arctic Geophysics Inc.

Geophysical Surveys • Prospecting • Consulting

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Geophysical Survey with 2D Resistivity
51 Pup, Yukon

N63° 44‘ 19.0“
W138° 40‘ 26.7“
115O/10

FOR
Melvin Zeiler
Mayo, Yukon YT
Y0B 1G0

AUTHORS
Philipp Moll
Stefan Ostermaier

WORK PERFORMED
August 5th 2010

DATE OF REPORT
February 12th 2011

Dawson Mining District

Index

1. Introduction

This geophysical investigation was done for Melvin L. Zeiler.

The survey, using 2D Resistivity, was conducted to prospect the ground for placer mining interests.

The ground was tested with one 620m-measuring line, depth 100m.

2. List of Claims / Prospecting Leases

Grant Number	**Claim Name**	**Owner**
P 39306	Disc.	Melvin L. Zeiler

3. Location

The placer claim Disc (P 39306) is located on *51 Pup,* which is a tributary of *Gold Run Creek* which in turn is a tributary of *Dominion Creek*.

4. Access

The claim Disc (P 39306) was accessed by the mining road that runs along the Gold Run Creek valley and a trail which connects 51 Pup to the mining road.

5. Goal

The survey was focussed on measuring and interpreting following **subsurface characteristics**:

Placer Prospecting

1. Depth and topography of bedrock
   - Paleochannels
2. Sedimentary stratification
   - Different ground materials
3. Permafrost conditions
4. Groundwater table

6. Methods

A **Resistivity** measurement is a reliable foundation for the interpretation of the subsurface conditions at this **placer** prospection. It usually allows for good interpretation of bedrock and overburden.

Resistivity

Resistivity systems inject low frequency alternating current into the ground. Serial electrodes produce plenty of current flow fields of different size and shape which are systematically covering the subsurface below the measuring line. Material changes in the subsurface deform the electrical field which is recorded by potential electrodes measuring voltage fluctuations created by variations in the resistivity of the ground.

Resistivity is an excellent geophysical method for the detection of very shallow and deep layer interfaces in nearly all surface and subsurface conditions in Yukon/BC. Measuring shallow interfaces for a long distance is more economic than with seismic. The depth penetration is much higher than with ground penetrating radar. In ground with disturbing influences such as discontinuous permafrost, measurements with Resistivity promise more reliable interpretations as with geophysical methods purely based on signal reflection (time domain methods). Resistivity doesn't measure a signal delay, it measures a material property. A lightweight system is available for flexible use with a small crew.

7. Use of Geophysical Methods

7.1. Instrumentation

For this survey a lightweight, custom-built 2D RESISTIVITY and INDUCED POLARIZATION (IP) imaging system with rapid automatic data acquisition was used. The system includes:

- "4 POINT LIGHT" EARTH RESISTIVITY METER[1]
- 100 ELECTRODE CONTROL MODULES[2]
- 100 STAINLESS STEEL ELECTRODES[3]
- 500m MULTICORE CABLE: CONNECTOR SPACING: 5m[4]

This system weighs approximately 60 kg which is about one third of regular standard equipment. It can be run with a 12V lead battery. The equipment facilitates high mobility and rapid data acquisition.

[1] Constructed and produced by LGM (Germany)
[2] Ditto
[3] Constructed and produced by GEOANALYSIS.COM (Germany)
[4] Ditto

7.2. Data Acquisition

The **data acquisition** is carried out by the automatic activation of 4-point-electrodes. Thus several thousand measurements are taken, one every 1-2 seconds. The AC transmitter current of 0.26 to 30 Hz is amplified by the electrode control modules, up to a maximum of 100mA and 400V peak to peak. The voltage measured at the receiver electrodes (M, N) is also amplified.

In this geoelectrical survey the **Schlumberger-array** was used. This array is appropriate to image horizontally running layers as is needed for placer prospecting.

7.3. Processing

The measured Resistivity data were processed with the **RES2DINV** inversion program[5].

7.4. Interpretation

The Interpretation of the measured data is supported by:

Experience - measuring practice with Resistivity/IP in Yukon/BC since 2005
Discussion - with the customer, and within the Arctic Geophysics team
Comparison - between geophysical and technological information found in other surveys
Observation - of surficial conditions in the field
Sources - Bedrock Geology Map[6]

7.5. Profile image

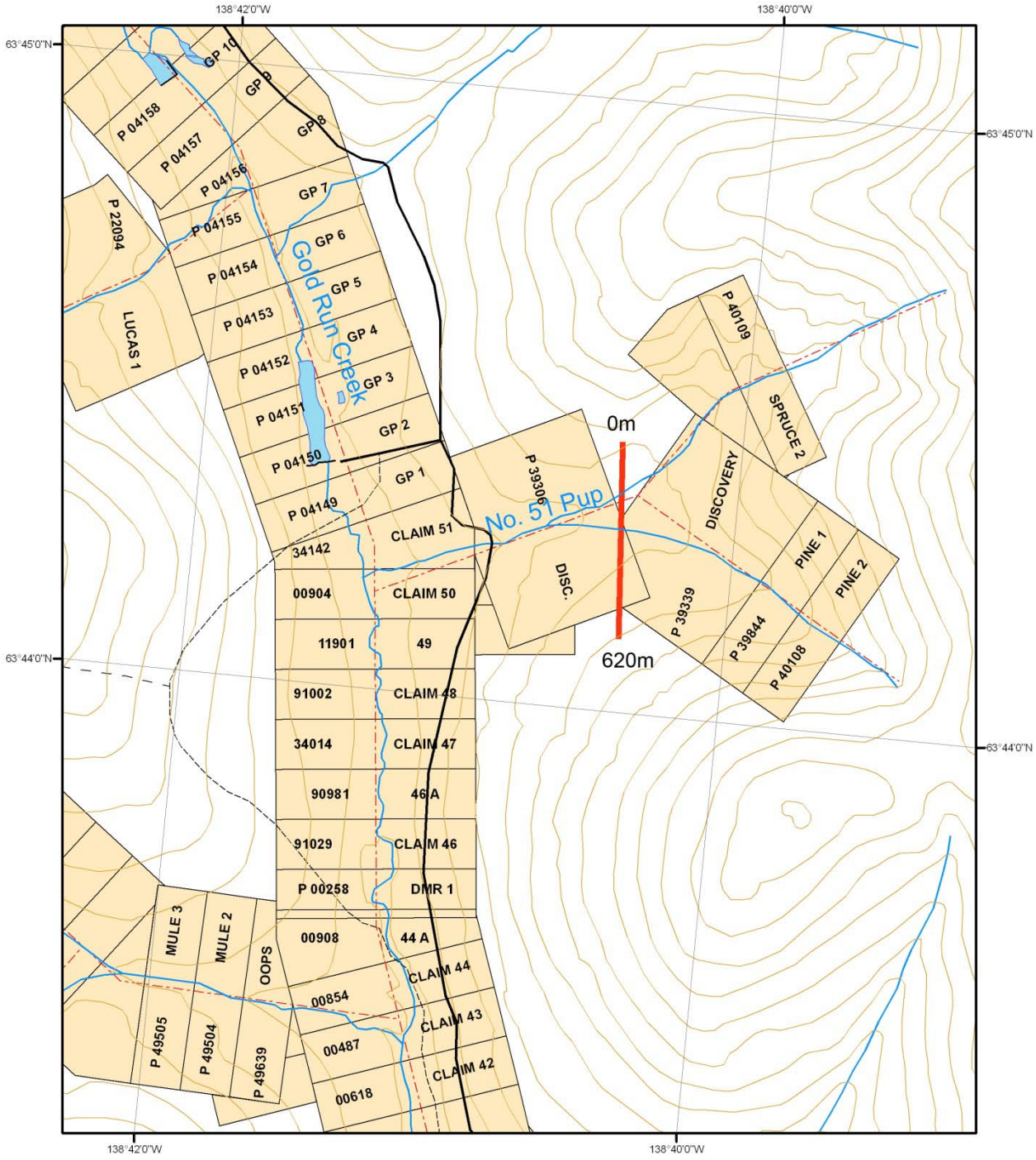
In the **Resistivity profile** the interpreted layer interfaces are marked with a black line. Please be aware: The profiles show **ground-layers approximately 15% thicker** than they are in reality. The thickening of the model layers is caused by the inversion software. The correction factor of 0.85 for the determination of the true layer thickness has been established by the Arctic Geophysics Inc. team on the basis of numerous geoelectrical profiles verified by drilling, trenching, and mining done by our customers.

[5] Produced by GEOTOMO SOFTWARE (Malaysia)
[6] Gordey, S.P. and Makepeace, A.J. (comp.) 1999: Yukon bedrock geology in Yukon digital geology, S.P. Gordey and A.J. Makepeace (comp.); Geological Survey of Canada Open File D3826 and Exploration and Geological Services Division, Yukon, Indian and Northern Affairs Canada, Open File 1999-1(D)

The **graphical markings** showing the interpreted layer interfaces in the profiles (using the black lines) are done accordingly to the data structure in the profile itself. This means: the layers there will also show up approximately 15% thicker than they are in reality. In the interpretation text the layer thicknesses and depths have been recalculated to the expected real values

8. Resistivity Survey at 51 Pup

Survey Map 115O/10



Legend

- measuring line
- contour line
- water course
- dam
- road
- trail
- cut line

placer claims

STATUS

- Active
- Expired
- placer baseline

Survey Map

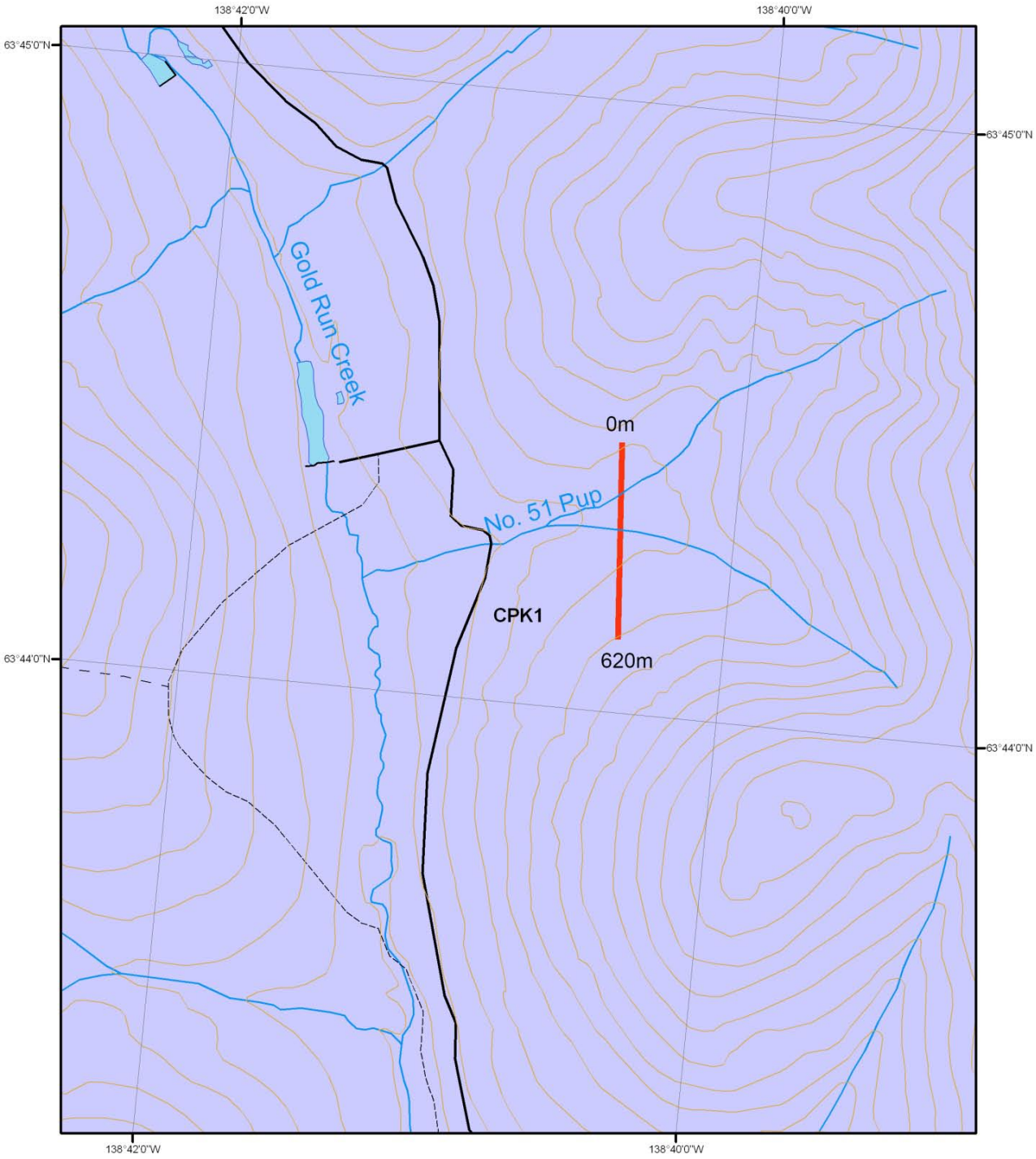
115O10

Universal Transverse Mercator Zone 7
North American Datum 1983

Scale 1:15.000

0 125 250 500 750 1.000 Meters

Bedrock Geology Map 115O/10



Legend

- measuring line
- contour line
- water course
- dam
- road
- trail
- cut line

Carboniferous and Permian

CPK1: Klondike Schist: tan to rusty and black weathering muscovitic and/or chloritic quarzite and quartz-muscovite-chlorite schist; quartz and/or feldspar augen-bearing quartz-muscovite (clorite) schist; includes augen gneiss and amphibolite

Bedrock Geology Map

115O10

Universal Transverse Mercator Zone 7
North American Datum 1983

Scale 1:15.000

0 155 310 620 930 1.240 Meters

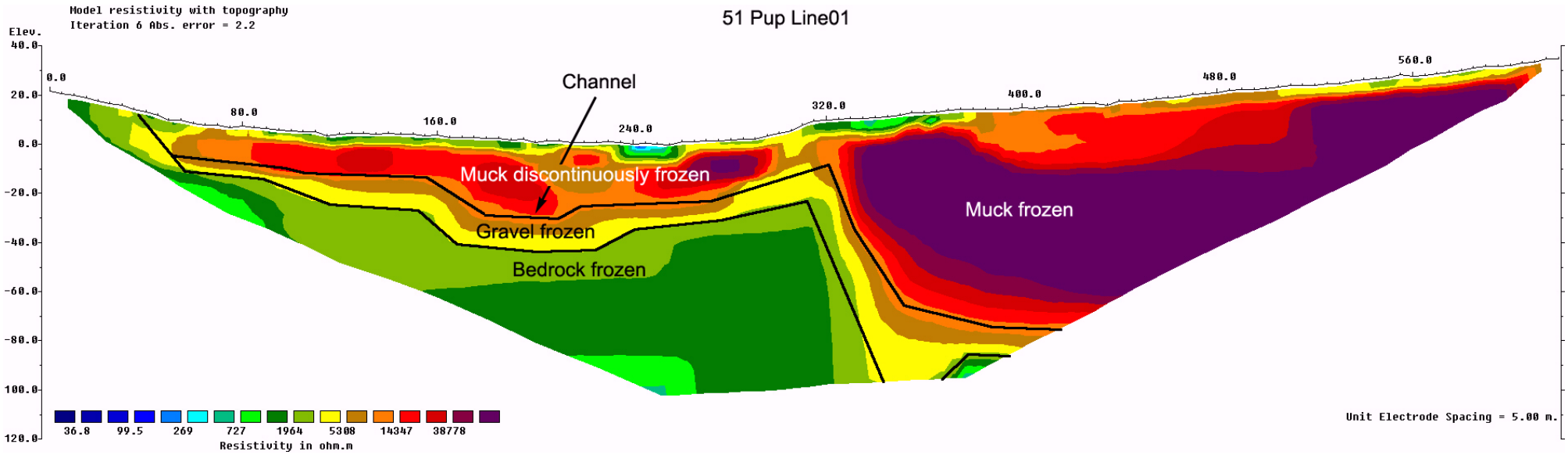
Measurements

Preliminary Note!

The subsurface information of this study is an interpretation.

51 Pup 01

Line: Cross valley	**Horizontal/vertical measure:** in [meter]	**Data acquisition:** Philipp Moll , Stefan Ostermaier
View: Upstream	**Iteration error:** in [%]	**Processing:** Philipp Moll , Stefan Ostermaier
Electrodes: 125, spacing 5m	**Vertical Exaggeration:** 0.92	**Interpretation:** Philipp Moll, Stefan Ostermaier



Interpretation

The **resistivity profile** shows 12-91m of overburden on top of Klondike Schist[7] bedrock. The overburden shows the Klondike typical stratification of muck-gravel-bedrock.

On the left hand side of the profile, till 310m, the **overburden** should consist of about two thirds of muck (12-20m) and one third of the gravel (5-12m).

At 160-225m a **paleochannel** approx. 37m deep seems to be located. It might be filled with about 26m of muck and 11m of gravel.

At 320m the **bedrock** abruptly drops down to about 85m depth. Here a **dip-slip fault** could start. To the right of the possible dip-slip fault the overburden shows a huge deposition of muck (about 75m) on top of gravel (10m). The interpretation of the muck deposit is supported by the phenomenon that frozen muck has very high resistivity values whereas frozen gravel has lower resistivity values.[8] Alternatively there could be a **channel** presenting its deepest bedrock at 350m in the line.

There is lots of **permafrost** throughout the profile; the only exceptions are the very first 50m of the profile where the profile extends up on a south facing slope.

[7] Gordey, S.P. and Makepeace, A.J. (comp.) 1999: Yukon bedrock geology in Yukon digital geology, S.P. Gordey and A.J. Makepeace (comp.); Geological Survey of Canada Open File D3826 and Exploration and Geological Services Division, Yukon, Indian and Northern Affairs Canada, Open File 1999-1(D)

[8] Material with small particles e.g. muck, has a high pore volume which is usually filled with water and thus produces good conductivity. In permafrost conditions this effect is reversed since the water is now frozen and insulates the particles from each other thus producing very poor conductivity. The smaller the particles are the better the insulation will be. This is the reason why frozen gravel has a better conductivity compared to frozen muck.

9. Recommendations

The interpretation of the subsurface conditions, based on the Resistivity profile, should be verified by technological methods.

The following table shows some suitable locations in the profile to verify overburden and bedrock with drilling or shafting.

Profile	**Location in the profile [m]**	**Depth**
01	200m checking hypothetical channel	37m

The hypothetical **paleochannel** at 160-225m could be well worth the effort of further prospecting.

The permafrost conditions at 51 Pup should allow for representative drill results even with an auger drill.

Due to the great thickness of the muck layer at 320-620m in the profile, it seems moot to do further testing at this location in the profile.

10. References

Literature

Chesterman W. Ch. and Lowe K.E. Field Guide to Rocks and Minerals - North America, Chanticleer Press Inc. New York 2007

Evans A.M. Erzlagerstättenkunde, Ferdinand Enke Verlag Stuttgart (1992)

Griffiths, D.H.,Turnbull, J. and Olayinka,A.I. Two dimensional resistivity mapping with a computer-controlled array, First Break 8: 121-129 (1990)

Griffiths, D.H. and Barker, R.D. Two-dimensional resistivity imaging and modeling in areas of complex geology. Journal of Applied Geophysics 29 : 211 - 226. (1993)

Keller, G.V.and Frischknecht, F.C. Electrical methods in geophysical prospecting. Oxford: Pergamon Press Inc. (1966)

Loke M.H. and Barker R.D. Rapid least-squares inversion of apparent resistivity pseudosections by a quasi-Newton method. Geophysical Prospecting 44: 131-152 (1996)

Press F., Siever R., Grotzinger J., Thomas H.J. Understanding Earth, W.H. Freeman and Company, New York (2004)

Robb L. Introducing to Ore-Forming Processes, Backwell Science Ltd., 2005

Maps

http://www.yukonminingrecorder.ca/PDFs: 115O/10

Gordey, S.P. and Makepeace, A.J. (comp.) 1999: Yukon bedrock geology in Yukon digital geology, S.P. Gordey and A.J. Makepeace (comp.); Geological Survey of Canada Open File D3826 and Exploration and Geological Services Division, Yukon, Indian and Northern Affairs Canada, Open File 1999-1(D)

YUKON GEOLOGICAL SURVEY, Mineral Occurrence Map, Energy Mines and Resources, Yukon Government, Map Version 2004-3, updated July 14, 2004

11. Qualification

Stefan Ostermaier

- Study of geology, University of Tübingen, Germany
- Visit of geophysical field courses, University of Karlsruhe and University of Stuttgart, Germany
- Geological prospecting for precious metals and minerals in the Yukon and Alaska since 2001
- Geophysical Surveying for Mining Exploration in the Yukon since 2005
- Study of computer science, University of Stuttgart, Germany

Stefan Ostermaier

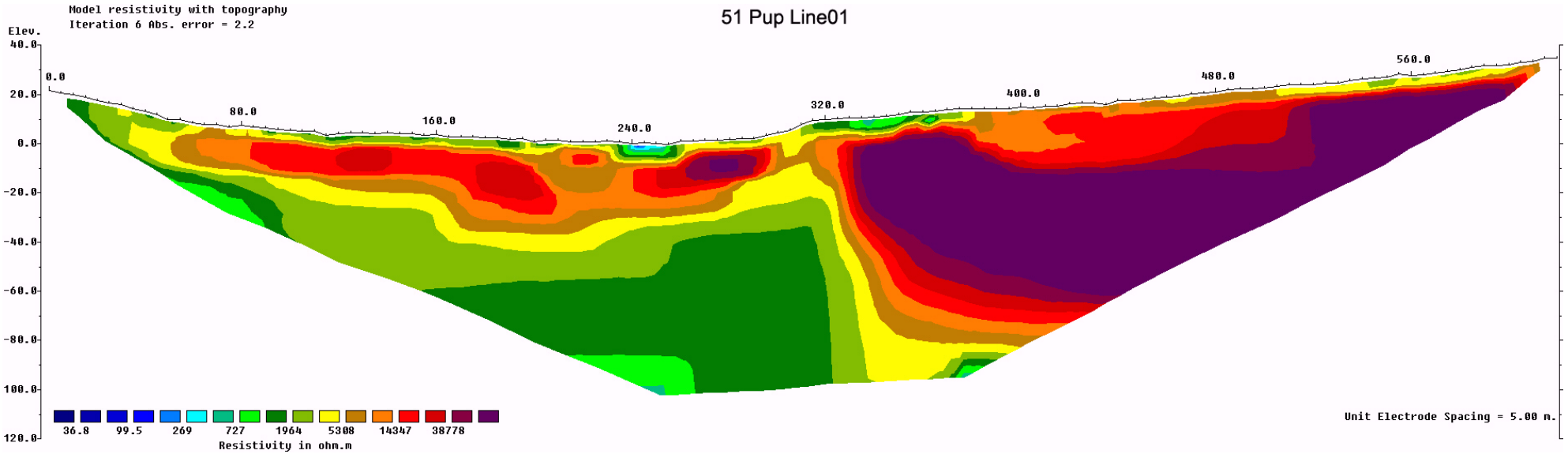
Philipp Moll

- Study of geology, University of Freiburg, Germany
- Visit of geophysical field courses, University of Karlsruhe and University of Stuttgart, Germany
- Geological Prospecting for precious metals and minerals in the Yukon, NWTs, and Alaska since 1989
- Geophysical surveying for Mining Exploration in the Yukon since 2005
- Study of biology and German language and literature, University of Freiburg, Germany
- Apprenticeship of precision mechanic, Tools Factory Hermann Bilz, Zell, Germany

Philipp Moll

12. Addendum

Profiles raw



GPS-Data

51 Pup Line1

Profile [m]	Latitude / Longitude
0	N63 44 26.5 W138 40 26.8
5	N63 44 26.5 W138 40 26.9
10	N63 44 26.3 W138 40 27.0
15	N63 44 26.1 W138 40 27.0
20	N63 44 26.0 W138 40 27.1
25	N63 44 25.8 W138 40 27.1
30	N63 44 25.7 W138 40 27.1
35	N63 44 25.5 W138 40 27.1
40	N63 44 25.4 W138 40 27.0
45	N63 44 25.2 W138 40 27.1
50	N63 44 25.1 W138 40 27.2
55	N63 44 24.9 W138 40 27.1
60	N63 44 24.7 W138 40 27.0
65	N63 44 24.6 W138 40 27.0
70	N63 44 24.4 W138 40 27.0
75	N63 44 24.3 W138 40 27.0
80	N63 44 24.2 W138 40 27.0
85	N63 44 24.0 W138 40 27.0
90	N63 44 23.8 W138 40 27.0
95	N63 44 23.6 W138 40 27.1
100	N63 44 23.5 W138 40 27.0
105	N63 44 23.4 W138 40 27.0
110	N63 44 23.3 W138 40 27.1
115	N63 44 23.1 W138 40 27.1
120	N63 44 23.0 W138 40 27.1
125	N63 44 22.8 W138 40 27.1

Profile [m]	Latitude / Longitude
130	N63 44 22.6 W138 40 27.1
135	N63 44 22.4 W138 40 27.0
140	N63 44 22.3 W138 40 27.0
145	N63 44 22.1 W138 40 26.9
150	N63 44 21.9 W138 40 26.9
155	N63 44 21.8 W138 40 26.9
160	N63 44 21.6 W138 40 26.8
165	N63 44 21.5 W138 40 26.9
170	N63 44 21.3 W138 40 26.8
175	N63 44 21.1 W138 40 26.8
180	N63 44 21.0 W138 40 26.8
185	N63 44 20.8 W138 40 26.8
190	N63 44 20.6 W138 40 26.8
195	N63 44 20.5 W138 40 26.8
200	N63 44 20.4 W138 40 26.8
205	N63 44 20.2 W138 40 26.8
210	N63 44 20.1 W138 40 26.8
215	N63 44 19.9 W138 40 26.8
220	N63 44 19.7 W138 40 26.7
225	N63 44 19.5 W138 40 26.7
230	N63 44 19.4 W138 40 26.7
235	N63 44 19.2 W138 40 26.7
240	N63 44 19.0 W138 40 26.7
245	N63 44 18.9 W138 40 26.6
250	N63 44 18.7 W138 40 26.5
255	N63 44 18.6 W138 40 26.7

Profile [m]	Latitude / Longitude
260	N63 44 18.4 W138 40 26.7
265	N63 44 18.3 W138 40 26.6
270	N63 44 18.1 W138 40 26.5
275	N63 44 18.0 W138 40 26.4
280	N63 44 17.8 W138 40 26.4
285	N63 44 17.7 W138 40 26.4
290	N63 44 17.5 W138 40 26.4
295	N63 44 17.4 W138 40 26.3
300	N63 44 17.1 W138 40 26.3
305	N63 44 17.0 W138 40 26.3
310	N63 44 16.8 W138 40 26.4
315	N63 44 16.7 W138 40 26.3
320	N63 44 16.6 W138 40 26.2
325	N63 44 16.4 W138 40 26.1
330	N63 44 16.3 W138 40 26.1
335	N63 44 16.1 W138 40 25.9
340	N63 44 15.9 W138 40 25.9
345	N63 44 15.8 W138 40 25.8
350	N63 44 15.6 W138 40 25.8
355	N63 44 15.5 W138 40 25.7
360	N63 44 15.3 W138 40 25.6
365	N63 44 15.2 W138 40 25.6
370	N63 44 15.0 W138 40 25.5
375	N63 44 14.9 W138 40 25.4
380	N63 44 14.7 W138 40 25.3
385	N63 44 14.6 W138 40 25.2

Profile [m]	Latitude / Longitude
390	N63 44 14.4 W138 40 25.1
395	N63 44 14.3 W138 40 25.2
400	N63 44 14.1 W138 40 25.1
405	N63 44 14.0 W138 40 25.0
410	N63 44 13.8 W138 40 25.0
415	N63 44 13.6 W138 40 24.9
420	N63 44 13.4 W138 40 24.9
425	N63 44 13.3 W138 40 24.9
430	N63 44 13.2 W138 40 24.9
435	N63 44 13.0 W138 40 24.8
440	N63 44 12.8 W138 40 24.8
445	N63 44 12.7 W138 40 24.7
450	N63 44 12.5 W138 40 24.7
455	N63 44 12.3 W138 40 24.6
460	N63 44 12.1 W138 40 24.7
465	N63 44 12.0 W138 40 24.6
470	N63 44 11.9 W138 40 24.6
475	N63 44 11.7 W138 40 24.6
480	N63 44 11.6 W138 40 24.6
485	N63 44 11.4 W138 40 24.5
490	N63 44 11.2 W138 40 24.4
495	N63 44 11.0 W138 40 24.4
500	N63 44 10.9 W138 40 24.3
505	N63 44 10.8 W138 40 24.3
510	N63 44 10.6 W138 40 24.2
515	N63 44 10.4 W138 40 24.1

Profile [m]	Latitude / Longitude
520	N63 44 10.3 W138 40 24.1
525	N63 44 10.1 W138 40 24.1
530	N63 44 10.0 W138 40 24.0
535	N63 44 09.8 W138 40 24.0
540	N63 44 09.7 W138 40 23.9
545	N63 44 09.5 W138 40 23.8
550	N63 44 09.4 W138 40 23.9
555	N63 44 09.2 W138 40 23.8
560	N63 44 09.1 W138 40 23.7
565	N63 44 08.9 W138 40 23.7
570	N63 44 08.7 W138 40 23.7
575	N63 44 08.6 W138 40 23.6
580	N63 44 08.4 W138 40 23.7
585	N63 44 08.3 W138 40 23.6
590	N63 44 08.1 W138 40 23.5
595	N63 44 08.0 W138 40 23.5
600	N63 44 07.8 W138 40 23.5
605	N63 44 07.7 W138 40 23.4
610	N63 44 07.5 W138 40 23.3
615	N63 44 07.4 W138 40 23.4
620	N63 44 07.2 W138 40 23.4

Cost

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Invoice # 20100805

Date: August 5th, 2010

Services provided:

Quantity	Description	Amount $CAN
Transportation		
1 days	Vehicle @ $CAN 40.00 / day	40.00
140 Km	Km @ $CAN 0.45	63.00
Geophysical Survey		
1 days	Geoelectrical 2D-Resistivity with two operators	900.00
1 day	Writing Report	250.00
	NET Amount	**$ 1 253.00**
GST Number 846363216RT0001	**G.S.T. (5%)**	**$ 62.65**
	Total Due	**$ 1 315.65**

Confirmation: Mel Zeiler did two days of line cutting before running the survey.