Ministry of Energy & Mines
Energy & Minerals Division
Geological Survey Branch

ASSESSMENT REPORTTITLE PAGE AND SUMMARY

TYPE OF REPORT (type of survey(s))	TOTAL COST
GEOPHYSICAL 2D RESITIVITY	**$12,953.55**

AUTHOR(S) PHILLIP MOLL
ARCTIC GEOPHYSICS INC.
SIGNATURE(S) 'SIGNED AND SEALED"

NOTICE OF WORK NUMBER(S) / DATE(S)
YEAR OF WORK 2011

STATEMENT OF WORK - CASH PAYMENT EVENT NUMBERS / DATE(S)
Event Number 4894078; June 30, 2011

PROPERTY NAME WINGDAM

CLAIM NAME(S) (on which work was done) NAD1, PAUL 1 (plus Unnamed) 264743, 393756, 505154, 512159, 538712

COMMODITIES SOUGHT Gold (Au)
MINERAL INVENTORY MINFILE NUMBERS, IF KNOWN 093G 022; 093G 025
MINING DIVISION Cariboo NTS 093H/04W TRIM 093G.001
LATITUDE 53° 2' 53''N LONGITUDE 121° 57' 50''W (at centre of work)
NORTHING 5878118 EASTING 569456 UTM ZONE 10N MAP DATUM NAD83

OWNER 1
Wingdam Gold Mines Inc.

OWNER 2

MAILING ADDRESS
2800-666 BURRARD STREET
VANCOUVER BC, V6C 2Z7

OPERATORS (who paid for work)
As above

MAILING ADDRESS

PROPERTY GEOLOGY KEYWORDS (lithology, age, stratigraphy, structure, alteration, mineralization, size, attitude)
Placer, sedimentary, unconsolidated, residual, glacial/fluvial gravels, pre-glacial, Quesnelia Terrane, Barkerville camp, Melvin, Sanderson, Cariboo Plateau, bench, Miocene (?) age, pre-Tertiary, mafic volcanic, Upper Triassic, buried channel, Lower Jurassic, Nicola Group, Upper Proterozoic to Lower Paleozoic Snowshoe Group, metasedimentary

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS
31599, 18842, 18558, 08269

Arctic Geophysics Inc.
Geophysical Surveys • Prospecting • Consulting

Geophysical Survey for Placer Prospecting at Lightning Creek

CARIBOO MINING DIVISON / QUESNEL / BC 2011
Latitude 53° 2’ 53’’N, Longitude 121° 57’ 40’’W
NTS MAPSHEET 093 G/01

ON PLACER TENURES
264743, 393756, 505154, 512159, 538712

METHODS
2D Resistivity, IP, Magnetics

FOR
WINGDAM GOLD MINES INC.
2800-666 BURRARD STREET, VANCOUVER BC, V6C 2Z7

PROVIDED BY
Arctic Geophysics Inc.
BOX 747 DAWSON CITY YT, Y0B 1G0

FIELD WORK
27th May - 28th May 2011

BC Geological Survey
Assessment Report
32493

REPORT / DATE
Philipp Moll / 30th October 2011

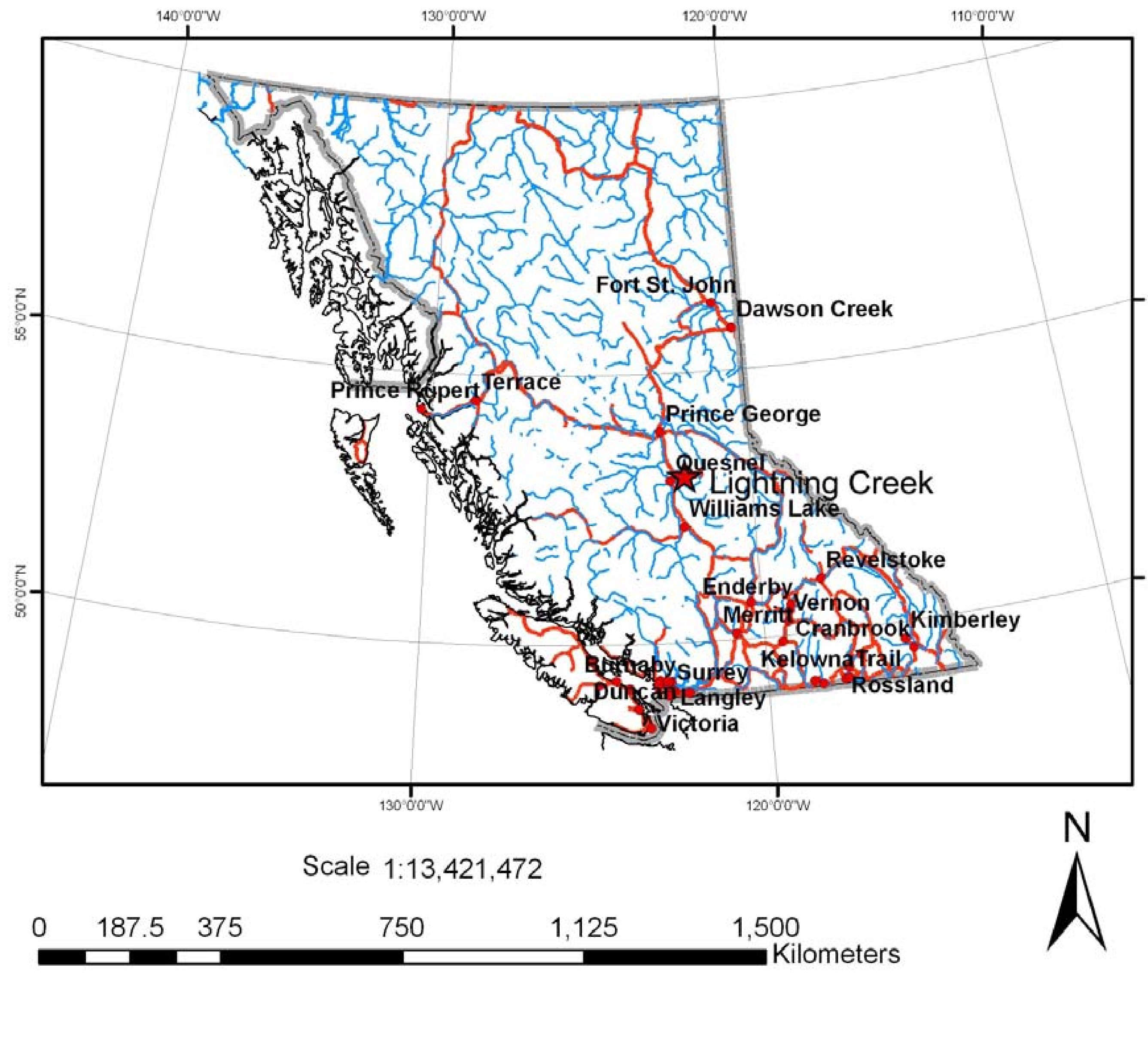
EVENT NUMBER
4894078

Table of contents

1. Introduction

The Quesnel area was the center of the Cariboo gold rush of the 1860s. Gold mining activities have never stopped until the presence. This traditional mining area has high potential for modern industrial placer mining.

The **geology** of the Lightning Creek area shows at least two glacial periods.[1] Today, the area represents a heterogeneous, complex stratigraphy: The overburden is a mosaic of pre-, inter- and post-glacial deposits potentially bearing different types of commercial gold placers.



[1] Levson M. and Timothy R. Giles: Geology of Tertiary and Quaternary Gold-Bearing Placers in the Cariboo Region, British Columbia

This geophysical survey, using **2D Resistivity/IP** and **Magnetics**, was done on the placer tenures (264743, 393756, 505154, 512159, 538712) at Lightning Creek, Quesnel area/Cariboo (Latitude 53° 2’ 53’’N, Longitude 121° 57’ 40’’W, NTS MAPSHEET 093 G/01) for **Wingdam Gold Mines Inc.**.

The claims were accessed directly from Hwy/BC-26 W, 45 Km from Quesnel/BC.

A total of 870m of measuring line was produced for each geophysical method that was employed during the survey. The measuring depth for 2D Resistivity/IP is approximately 100m.

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

1. Depth and topography of bedrock
    - Paleochannels
2. Sedimentary stratification
3. Groundwater table
4. Mining/prospecting history

This first pass geophysical survey using Resistivity, IP, and Magnetics is delivering subsurface information as the foundation for a systematic advanced prospection with technological means such as trenching and drilling.

2. Crew

Survey Leader:	Stefan Ostermaier
Geophysical Prospector:	Josy Strunden
Support, Documentation:	Philipp Moll

3. Fieldwork - Schedule

Fieldwork: 27-28th May 2011
Processing, Interpretation, Documentation: 1st -13th June 2011

4. Geophysical Methods

Resistivity is not a time domain geophysical method such as Ground Penetrating Radar or Seismic. Resistivity measures a material property. In the Resistivity model the different underground zones are material-dependently differentiated according to their electrical conductivity. Thus, Resistivity promises good chances in respect of measuring the kind and character of the subsurface materials as well as the groundwater distribution, which would be of interest for placer mining. The used equipment (see below) allows for measuring of layer interfaces in depths from 0.5m to 100m by varying the electrode spacing. – Therefore, this prospecting concept is based on the use of 2D Resistivity.

Induced Polarization (IP): IP data are simultaneously taken when measuring Resistivity, with the same equipment and line staking. So these data are automatically at hand when using Resistivity. The IP model serves as basis for the interpretation of the mineral and petrologic conditions in hardrock. Thus, IP is an industry proven standard method for the detection of primary mineral deposits. However, the IP model can also support the interpretation of the Resistivity profiles done for placer prospecting.

Magnetics is based on the characteristic of the earth's magnetic field to induce all matter, magnetic or non-magnetic, with magnetic properties (magnetic susceptibility). Rocks and other objects show a different magnetization depending on their material composition. Magnetics is a reliable method for investigating primary and secondary deposits. The measurability of gold placers depends on the ratio of the depth to the concentration of signal inducing, heavy placer minerals, especially magnetite.

Figure 1: 2D Resistivity measurement, Stefan Ostermaier, Arctic Geophysics Inc., Yukon 2009

5. Use of Geophysical Methods

5.1. Instrumentation

RESISTIVITY / IP

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

- "4 POINT LIGHT" EARTH RESISTIVITY METER[2]
- 175 ELECTRODE CONTROL MODULES[3]
- 175 STAINLESS STEEL ELECTRODES[4]
- 875m MULTICORE CABLE: CONNECTOR SPACING: 5m[5]

This system weighs approximately 120 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 with a small crew.

MAGNETICS

We use a GEMSYS GSM-19 GW with differential GPS as a walking magnetometer, and a GEMSYS GSM-19 as a base station.

5.2. Data Acquisition

Resistivity/IP

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.

The 2D Resistivity/IP imaging system, used for this survey, allows measurements with a depth of up to 100m. With a depth to bedrock of more than 6m, an electrode spacing of 5m can be used for placer surveys. This allows the measuring of large profile lengths in short time with a horizontal measuring resolution of 2.5m. This quantification has proven itself to be reliable in the determination of the bedrock topography and sedimentary arrangement for placer investigation at the most environmental conditions.

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

The **IP** data is getting noisy below approx. 50m depth because the sender current is limited to a 100 m Amp. The noise of the IP data in greater depth can significantly be decreased by using an IP-specific data acquisition mode that is much more time consuming.[6] Since this survey is focused on the detection of placer-geological aspects, the data acquisition was not optimized for IP.

Magnetics
Magnetic data were taken manually at the electrode locations, every 5 meter.[7] Thus, the geoelectrical profiles and the magnetogram do spatially coincide 100%.

The mobile magnetometer was synchronized with a base station.

5.3. Processing

Resistivity/IP
The measured Resistivity/IP data were processed with the **RES2DINV** inversion program[8].

Magnetics
The magnetic data were processed with the **GemLink5.0.0** program.
The magnetic data were normalized at 56 000 n Tesla.

5.4. Interpretation

The resistivity profile is the basic source for the interpretation of placer-related subsurface aspects of overburden and bedrock. IP and Magnetics data support the analysis of this combined geophysical investigation.

6. Geology

6.1. Overburden

The survey area was glaciated by most likely two main periods both releasing potentially thick overburden consisting of glacial and pre-glacial deposits. During the last glaciations the ice flowed in western direction from the Cariboo Mountains. So old river gravel deposits, which haven't been eroded by the glaciers might have been conserved in valleys and channels running across to this direction. Thick sequences of glaciofluvial gravel were deposited in braided

[6] 1) Transition Resistivity between electrodes and ground lower than 1 Kilo Ohm; 2) More single 4point measurements to calculate the average of each data point etc.
[7] Plastic probes where set instead of the stainless steel electrodes.
[8] Produced by GEOTOMO SOFTWARE (Malaysia)

outwash streams. Ice damming of tributary drainages was common and produced glaciolacustrine deposits of silt and clay.[9]

Glaciofluvial and glaciolacustrine deposits might be located mainly on top of till and sometimes on bedrock.

Within a glacial deposition cycle, mostly in the upper portions of the overburden, some clay layers were potentially produced which could have reflected the influence of deformable sediments.[10] This way, some deeper, older inter-glacial or pre-glacial deposits could have been protected against subsequent glacial erosion.

In the resistivity profiles, the overburden is showing heterogeneous data predominantly in a low range (20-2500 Ohm meter). The spatial arrangement of the data pattern is typical for a glaciated area having a complex multi-periodic transport history.

6.2. Bedrock

In the survey area the bedrock seems to be some schist: specifically some schist mostly strongly metamorphosed and sometimes greenish (Snowshoe Group).[11] This is the only rock type which has been observed at a few bedrock outcrops near the survey site.

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[9] Levson M. and Timothy R. Giles: Geology of Tertiary and Quaternary Gold-Bearing Placers in the Cariboo Region, British Columbia (93A, B G, H), 199: “General Geology”

[10] “Technical Review on various exploration licences held by Henning Gold Mines Inc.“ (Draft 9th May 2011): 5.5 Local Stratigraphy

[11] Ditto: 5.7.4 Lightning Creek, Wingdam

Bedrock Geology Map (Levson)[12]

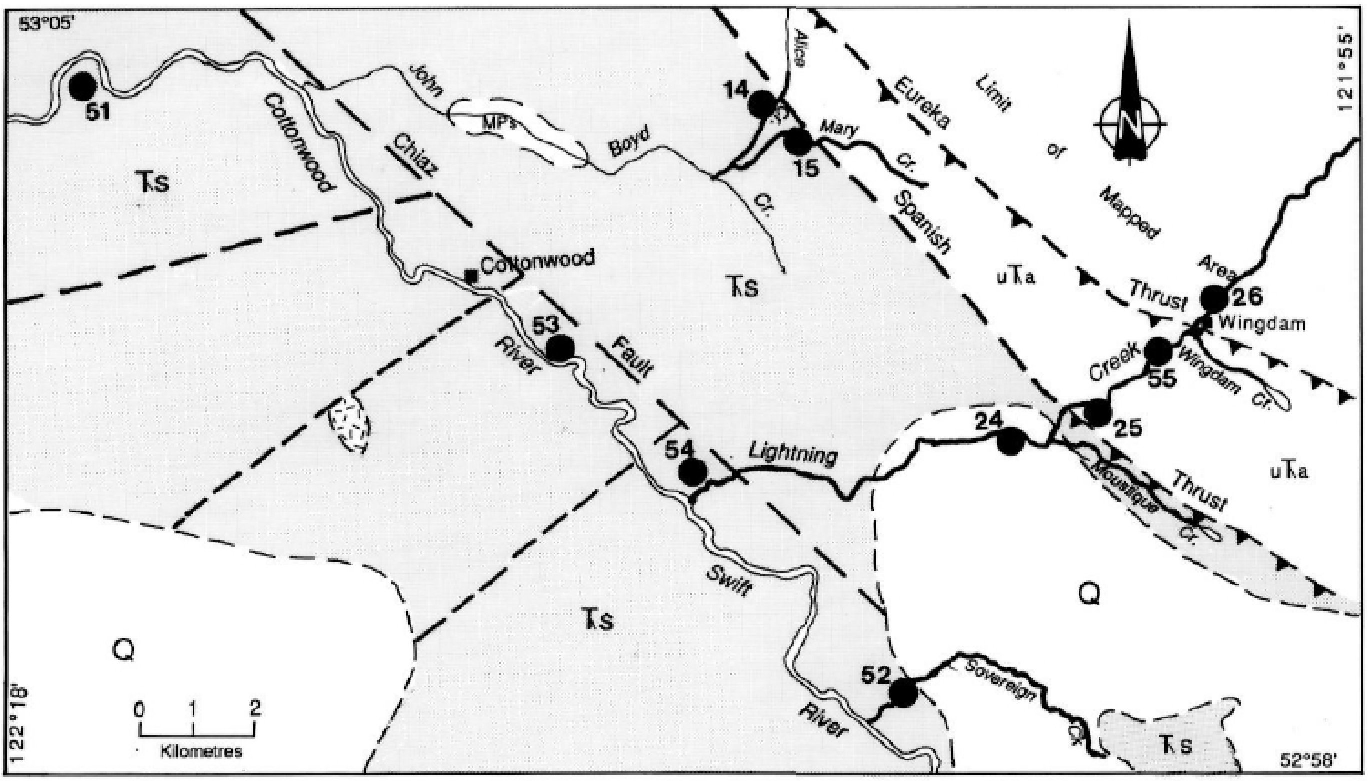


Figure 11. Bedrock geology, placer producing streams (heavy lines) and detailed study sites (solid circles) in the Cottonwood and Wingdam areas.

12 Levson M. and Timothy R. Giles: Geology of Tertiary and Quaternary Gold-Bearing Placers in the Cariboo Region, British Columbia (93A, B G, H): Figure 11

QUATERNARY

Q	Diamicton, gravel, sand, silt and clay

TERTIARY

Mvb	Miocene vesicular olivine basalt
MPs	Sandstone, shale, conglomerate, diatomite, lignite
Es	Eocene sandstone, mudstone and minor conglomerate

CRETACEOUS

Kgd	Hornblende granodiorite and quartz monzonite

JURASSIC

uJcg	Cobble conglomerate, mudstone and sandstone
Js	Siltstone and sandstone, massive to well bedded, commonly pyritic
Jb	Amygdaloidal, analcite-bearing, olivine basalt breccia and flows
lJvs	Volcanic breccia, tuff and tuffaceous siltstone and sandstone
	Syenite, monzonite and diorite; minor ultramafics, gabbro

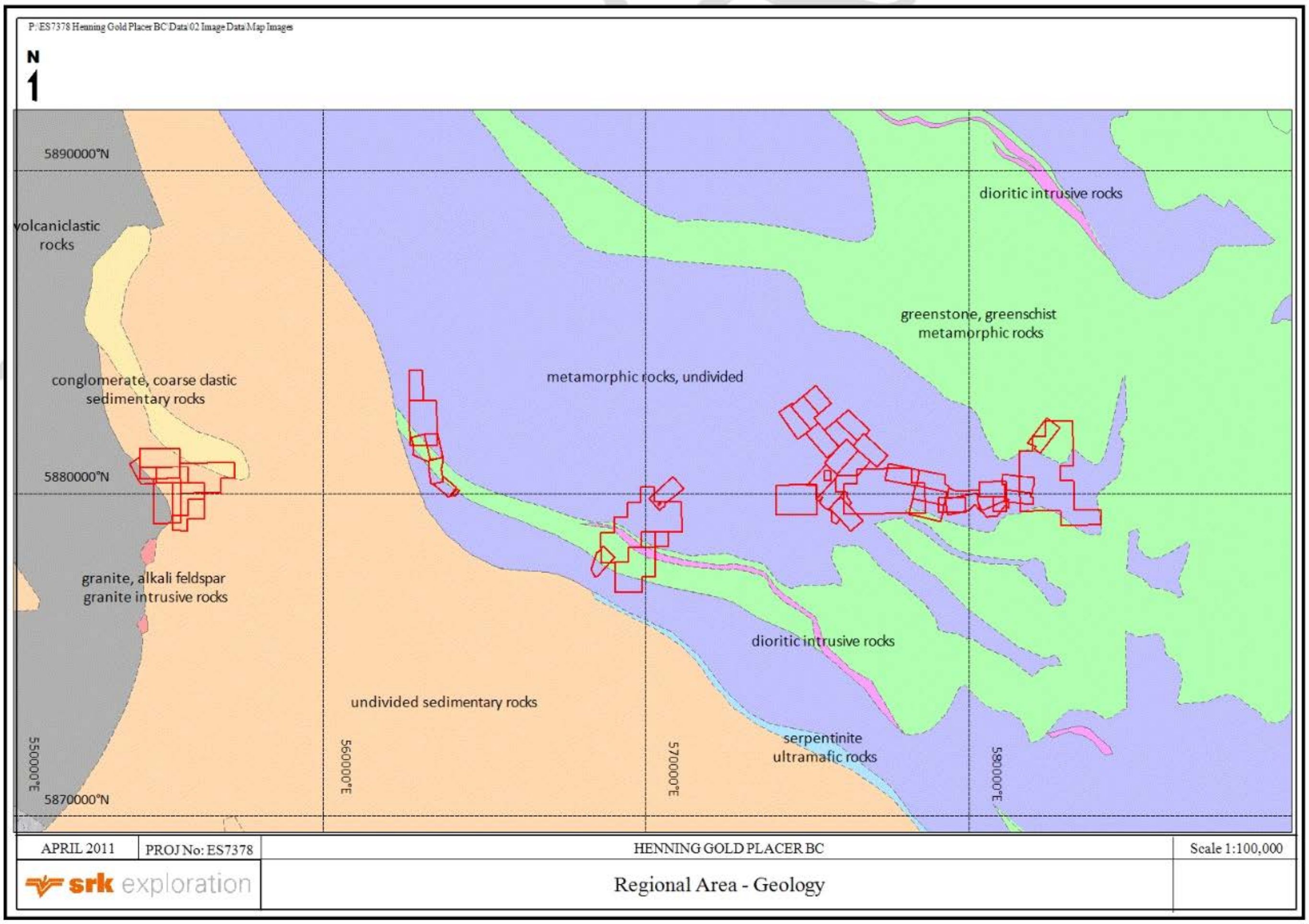
TRIASSIC

uTa	Phyllite, argillite, quartzite, schist, minor greenstone
uTvs	Basaltic breccia, flows and pillow lava; minor sandstone and tuff
Ts	Sandstone, siltstone and shale; mafic volcanic and volcaniclastic interbeds
– – –	Geological Contact
— — —	Fault (Known or Inferred)
▲ ▲ ▲	Thrust Fault
•	Placer Sites Visited

Source:

Bailey, D.G. (compiler) 1990. Geology of the Central Quesnel Belt, British Columbia; *B.C. Ministry of Energy, Mines and Petroleum Resources, Geological Survey Branch*, Open File 1990-31; 1:100 000.

Bedrock Geology Map (BC Digital)[13]



[13] Technical Review on various exploration licences held by Henning Gold Mines Inc." (Draft 9th May 2011): 5.4. Local Geology: Quesnel; 5.4. Local Geology, Figure 5-16

7. Geophysical Considerations

In the resistivity profile the **overburden** is showing a mosaic of heterogeneous data predominantly in the 20-2500 Ohm meter range. This data range is produced by sediments of different nature: The colluvium on the slope is very low conducting whereas the saturated deposits on the bottom are very well conducting

In the survey area the overburden mainly consisting of glacial till, glaciofluvial and glaciolacustrine deposits contain relatively high amounts of finer sediments such clay, silt, even in greater depth. Thus its resistivity can be low. Saturated silt can have penetrated into the space between larger sediment particles; this material is called "slum".[14] The conductivity of the slum is usually quite homogeneous. Thus, deposits of different type and age are sometimes hard to differentiate.

The Resistivity pattern in the profiles potentially indicates glaciofluvial and glaciolacustrine deposits on top of till, as well as glacial till on top of possible river gravel or bedrock. Clay layers or clay-rich layers acting as water barriers can reveal the layer borders in the sedimentary progression indicating a glacial period. Clay-rich layers could also indicate overlying inter-glacial and post-glacial stream-channel placers in the Lightning Creek area [which] have been mined in recent years. Layers characterized by clay are sometimes running uneven which "seals" sedimentary zones against each other producing resistivity alterations running horizontally and inclined! Uneven groundwater horizons are assumed to be common in the Resistivity profiles.

The interpretation of the Resistivity profiles is mainly focused on the differentiation of layers with different nature, age and origin: 1) glacial *till* being diamict mostly producing heterogeneous resistivity data; 2) *glaciofluvial and glaciolacustrine deposits* usually being well layered normally produce more homogeneous resistivity data; glaciolacustrine might show lower resistivity data since their sediments are finer.

Zones with different resistivity potentially indicate different layers of ground material - as defined above. However, strong saturation with groundwater can make those layers indistinguishable. A well conducting layer below a lower conducting layer is sometimes just indicating a groundwater boundary. But a lower conducting layer below a better conducting layer might indicate two different ground materials at a higher chance. This scenario could also indicate a clay layer ("false bedrock") embedded in the overburden as being a possible base for placers.

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[14] D.O. Donovan et alii: "Technical Review on various exploration licences held by Henning Gold Mines Inc." (Draft 9th May 2011) 5.4. Local Geology

Changes of the resistivity indicate different **bedrock** types or weathered bedrock zones. Rock erosion produces porosity which allows for the penetration of water. The rock becomes higher conductive. Frequently, the water "trapped" in rocks is rich in solved minerals which increase the conductivity even more. All in all, the changes in the resistivity data might be caused by the mineral composition, weathering, and water content.

8. Profile image

In the **Resistivity profile** the interpreted layer interfaces are marked with a black line. 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.[15]

The **graphical markings** showing the interpreted layer interfaces in the profiles (using a black line) 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 expected in reality. At the measuring sticks in the profile image as well as in the interpretation text, the layer thicknesses and depths have been recalculated to the expected real values.

Usually, the **IP profile** shows the interfaces/features seen in the Resistivity profile moderately displaced to another position, horizontally and vertically.

9. Line Arrangement

The **line locations** were discussed by the crews of SRK Explorations[16] and Arctic Geophysics and were decided by William Kellaway of SRK. The orientation of the lines was decided to be mostly in west-east direction to pick up paleochannels running northerly or southerly. Northerly or southerly running old, pre-glacial streambeds might show a lower glacial erosion of the auriferous deposits.[17]

All existing i**nfrastructure** was taken into consideration when deciding the line locations.

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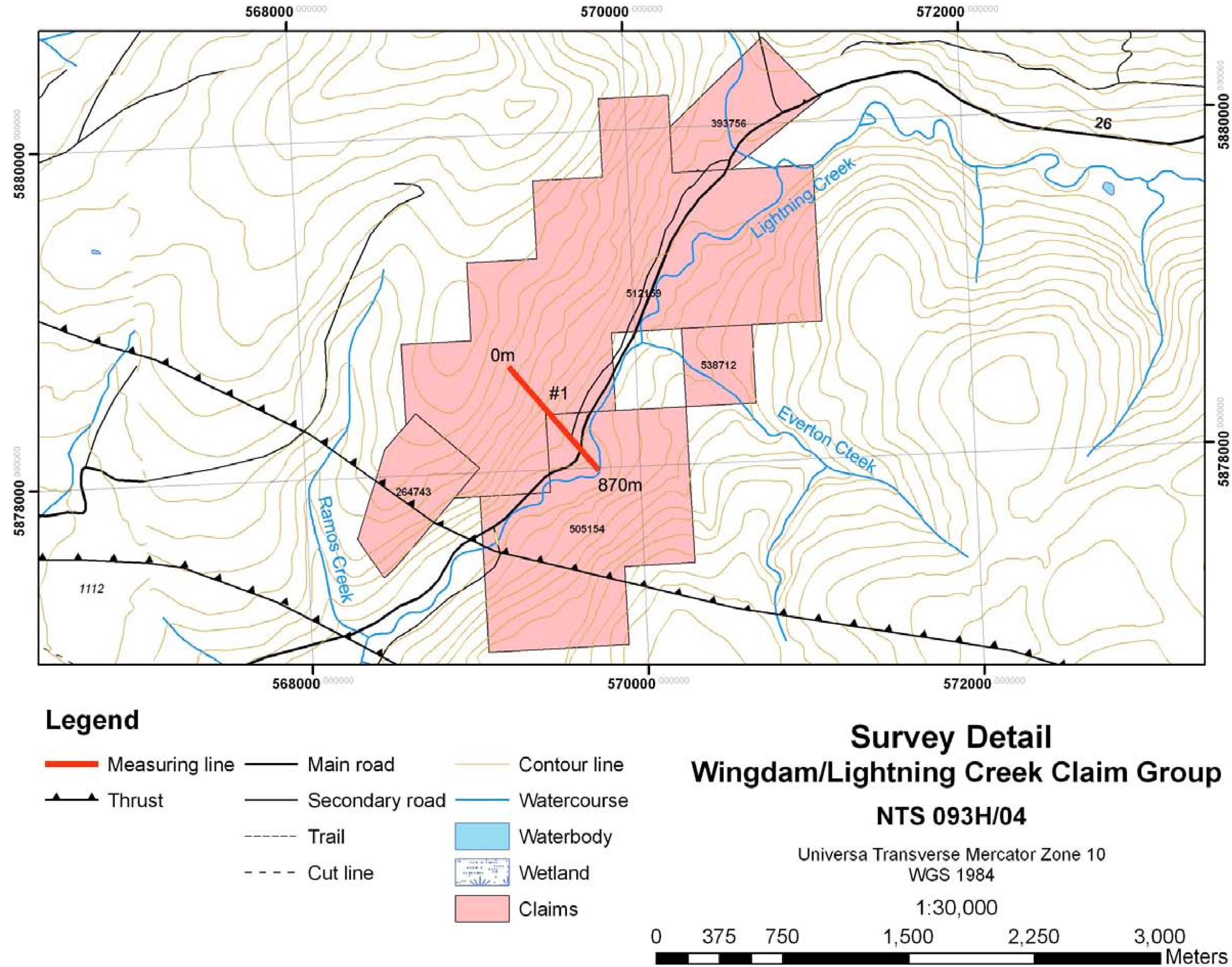
[15] Program settings in RES2DINV for modifying the layer thickness do frequently not work well for our use and could falsify the profile. That's why this mode was not used.

[16] William Kellaway and Richard Oseland

[17] Levson M. and Timothy R. Giles: Geology of Tertiary and Quaternary Gold-Bearing Placers in the Cariboo Region, British Columbia (93A, B G, H), 199: "Abandoned, Gravel-Bed Paleotrunk-Valley Deposits"


568000
570000
572000
5880000
5878000
26
393756
512159
538712
264743
505154
1112
Lightning Creek
Everton Creek
Ramos Creek
0m
#1
870m
Legend
Measuring line
Thrust
Main road
Secondary road
Trail
Cut line
Contour line
Watercourse
Waterbody
Wetland
Claims
Survey Detail
Wingdam/Lightning Creek Claim Group
NTS 093H/04
Universa Transverse Mercator Zone 10
WGS 1984
1:30,000
0 375 750 1,500 2,250 3,000
Meters

11. Interpretation of the Profiles

Line Dimension

In this survey 1 measuring line 2D Resistivity and Induced Polarization, 870m length, was produced. The measuring depth is 90m.

Geophysical Aspects

Interpretation of the profiles

The interpretation of the geoelectrical profiles shows 0 to 60m of overburden on top of bedrock.

Possible targets for advanced placer prospecting/mining are described in blue letters.

12. Interpretation of Profile

Lightning_01
2D Resistivity/IP, Schlumberger array
175 Electrodes: spacing 5m, Horizontal resolution 2.5m
Horizontal and vertical measure in [meter], Iteration error in [%]
Vertical exaggeration in model section display = 1.00

Data acquisition: Stefan Ostermaier, Josy Strunden, 27th-28th May 2011
Processing: Philipp Moll , 1st June 2011; Cariboo Range
Profile shows the ground-layers approx. 15% thicker than in reality.
Comments to this/these profile/s are interpretation.

Arctic Geophysics Inc.
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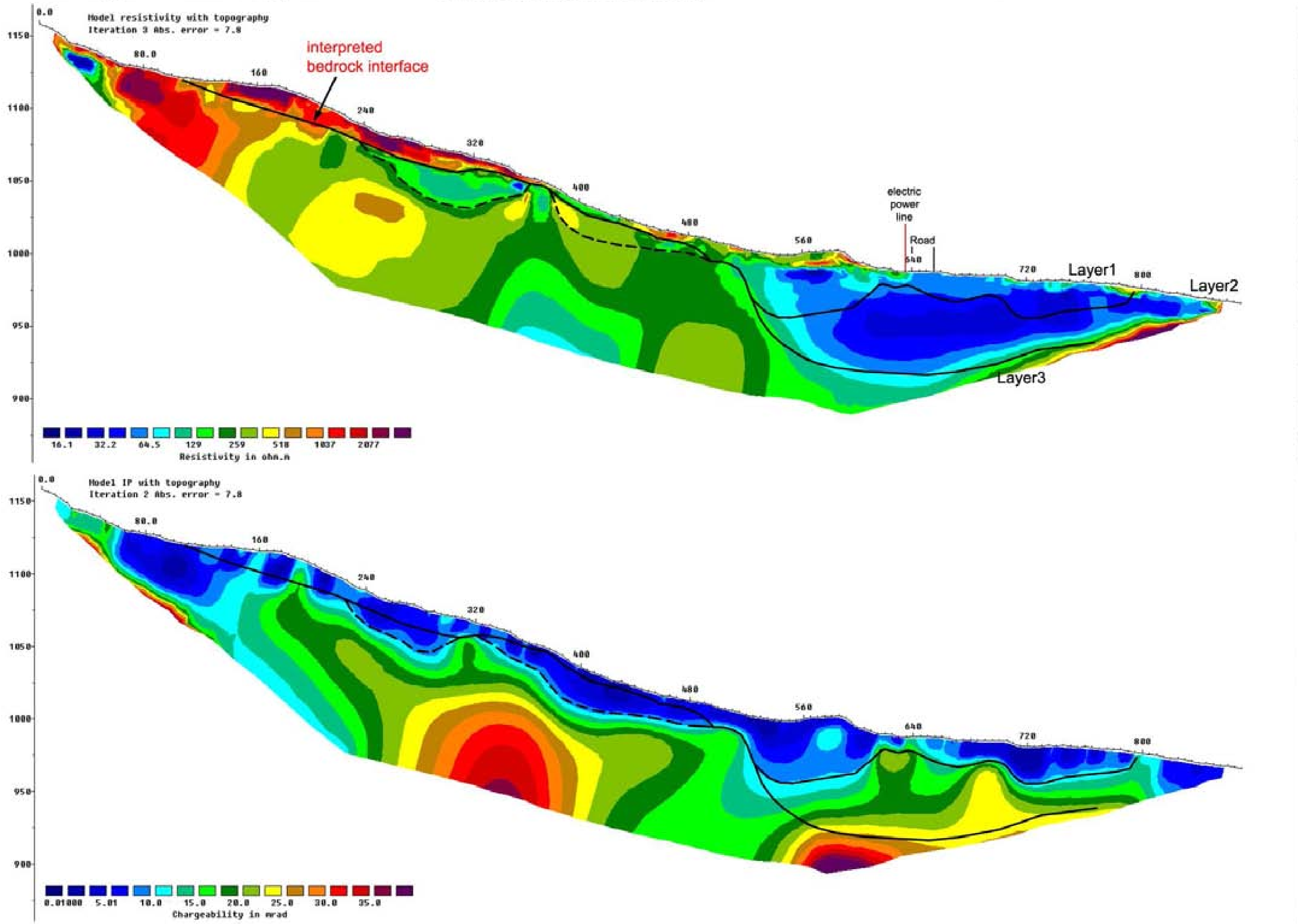
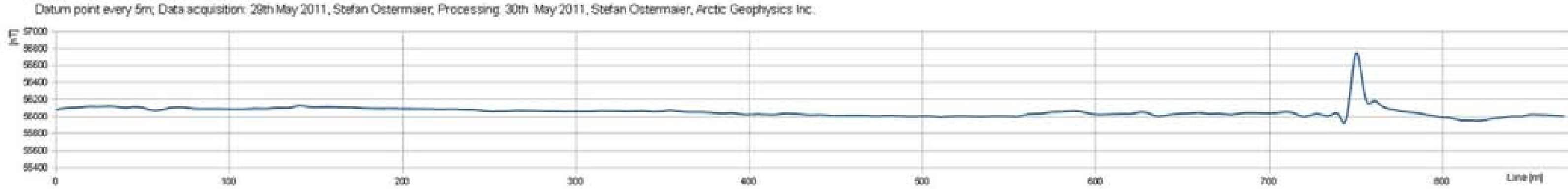


Wingdam_01 – Total Field Magnetics
Datum point every 5m; Data acquisition: 29th May 2011, Stefan Ostermaier, Processing: 30th May 2011, Stefan Ostermaier, Arctic Geophysics Inc.



Surface
Along the measuring line the ground was covered with very dense vegetation and humus. At 60m there was a bedrock outcrop presenting some solid schistose rocks identified as metamorphosed green schist facies (Snowshoe Group).[18] Beyond the road, after 655m some old tailings were seen. At the end of the profile an almost vertical brim, 10-15m deep, is located; it shows glacial till consisting of very round-washed gravels being richly mixed with fine sediments such as silt and clay. After the brim the valley floor starts.

Interpretation

Layer 1
The topmost layer is showing very large horizontal changes in the resistivity.

At 100-370m, Layer1 (red/violet) is interpreted to be colluvium derived from glacial till. This sediment seems to be very dry. Finer components such as silt and sand seem pretty much washed out. From 370 to 600m, the colluvium might be saturated in sections (green) – interrupted be dryer spots.

After 520m, the interpreted bedrock interface dips down causing a thickening of Layer1. Here the groundwater horizon starts (blue). The lower interface of Layer1 is defined by the IP model – whereas the Resistivity profile just shows a homogeneous well conducting zone indicating a highly saturated deposit ("slum"). Regarding the IP profile, Layer1 seems to be a deposit poor on clay due to the low chargeability: possibly some glaciofluvial deposits embedded in a clay-rich deposit underneath (Layer2). Possible alluvial channels would be around 560m (37m deep) and at 720m (23m deep).[19] The channel to the right coincides with a strong magnetic signal indicating possible heavy placer minerals. However, the magnetic peak is quite high and not located at the deepest spot of the assumed channel; it could also be affected by iron scrap not seen on the surface.

Layer 2
The second layer is continuously high conductive.

The undulating shape of Layer2, suggested by the IP model, seems to be formed by alluvial processes. The high chargeability of the layer might be affected by clay ("false bedrock")[20]. The clay-rich layer could seal the groundwater in the upper layer and would present very high conductivity as well.

Up the slope, two possible bedrock depressions are marked in the profiles by a dashed line. The upper depression, located around 300m, is indicated by both profiles (Resistivity/IP). It could be a pre-glacial river channel showing 12m of colluvium and 19m of gravel on top of bedrock. It might be less likely, a glacial melt water drainage could have cut this deep into solid metamorphic bedrock. Alternatively, this depression could be a weathered bedrock zone bearing stationary water. The little water spot at 360m (blue), could be an indication for this. The magnetogram does not indicate possible heavy placer minerals in this section. However, the channel would be about 30m deep which could be too much to measure the placer minerals.

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[18] D.O. Donovan et alii: "Technical Review on various exploration licences held by Henning Gold Mines Inc." (Draft 9th May 2011): 5.7.4 Lightning Creek, Wingdam

[19] When doing advanced technological prospecting such as drilling and trenching one should keep in mind that the features shown by the IP profile could be dislocated in a range of 1-10 meters estimated, vertically and horizontally.

[20] D.O. Donovan et alii: "Technical Review on various exploration licences held by Henning Gold Mines Inc." (Draft 9th May 2011): 5.7.4 Lightning Creek, Wingdam

The possible bedrock depression around 400m is well shown just by the IP model. Its shape does not suggest the existence of a pocket bearing placers.

At 630m the thickness of the overburden might be 60m. The bedrock could directly be covered with old pre-glacial river gravels, since the resistivity data of the deep overburden doesn't show disturbances. The hypothetic clay-rich layer (Layer2) could have "reflected the influence of deformable sediments on the preservation of older placers from glacial erosion".[21] The deepest spot of the bedrock should be at 913m elevation.

Layer 3

This Layer is a largely heterogeneous on geoelectrical data.

At 160m both geoelectrical profiles point to a prominent horizontal bedrock alteration. The resistivity data of both bedrock types are still fitting with metamorphosed green schist facies:
The red bedrock zone measures in the 2000 Ohm meter range; the green/yellow bedrock zone ranges from 200 to 500 Ohm meter. The conductivity is inversely proportional to the resistivity within a strict correlation.

The blue water body at 40m is a weathered zone in the bedrock trapping some very ion-rich water. This aspect tends to rebut the hypothesis of a paleo-channel at 320m.

The extremely high resistivity seen at 800m (violet) doesn't seem to be realistic. It could be explained by the lack of ground material caused by the immediate brim at the end of the line. This might have irritated the equipotential field. However, the interface between Layer2 and 3 rises to the right side – also supported by the IP model.

[21] Ditto: 5.4 Local Geology

13. Qualifications

Philipp Moll
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Phone: 001-867-993 3671 (Canada)
01149 (0)781 970 5893 (Germany)
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Certificate of Qualifications

I, Philipp Moll, currently residing at “Am Holderstock 7, 77652 Offenburg, Germany, do hereby certify that:

1. I have studied Geology at the University of Freiburg, Germany.
2. I have visited of geophysical field courses at the University of Karlsruhe in Germany.
3. I have been working for Arctic Geophysics Inc. since June 2007 (foundation). For this company I have carried out geophysical field surveys using 2D Resistivity, Induced Polarization, and Magnetics: Data acquisition, processing, interpretation, documentation.
4. I have done geophysical surveying for mining exploration in the Yukon since 2005, and geological prospecting for precious metals and minerals in the Yukon, NWTs, and Alaska since 1989
5. I have written the following publications/reports:

    A) Numerous Assessment Reports about geophysical surveys done for Yukon mining companies, filed at Yukon Mining Recorder, Dawson City and Whitehorse, Yukon.

    B) Publication about a geophysical survey (45 field days) for the Yukon Government: Yukon Geological Survey:

    http://www.geology.gov.yk.ca/recent.html Open Files:

    Moll, P., & Ostermaier, S., 2010. 2D Resistivity/IP Data Release for Placer Mining and shallow Quartz Mining - Yukon 2010. Yukon Geological Survey Miscellaneous Report MR-4. PDF Report [10.3 MB] & Data Profiles, 45.4 MB]]

14. Confirmation

I have prepared, along with Fran Macpherson, this report entitled 2D Resistivity Survey on the Mary Property for assessment credit, and reviewed the data contained in the report titled: “Geophysical Survey for Placer Prospecting at Mary Creek”. The survey was carried out by Arctic Geophysics Inc.

Offenburg, Germany, 30th October, 2011
“Signed and Sealed” Philipp Moll

Philipp Moll

Literature

Location-specific

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CVG Unterground plan, L. Sinclair, 8th May 2011

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Web Sources

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Geophysical Data Table

Rock type	Resistivity range (Ωm)
Granite porphyry	4.5×10^3 (wet) – 1.3×10^6 (dry)
Feldspar porphyry	4×10^3 (wet)
Syenite	$10^2 - 10^6$
Diorite porphyry	1.9×10^3 (wet) – 2.8×10^4 (dry)
Porphyrite	$10 - 5 \times 10^4$ (wet) – 3.3×10^3 (dry)
Carbonatized porphyry	2.5×10^3 (wet) – 6×10^4 (dry)
Quartz diorite	$2 \times 10^4 - 2 \times 10^6$ (wet) -1.8×10^5 (dry)
Porphyry (various)	$60 - 10^4$
Dacite	2×10^4 (wet)
Andesite	4.5×10^4 (wet) – 1.7×10^2 (dry)
Diabase (various)	$20 - 5 \times 10^7$
Lavas	$10^2 - 5 \times 10^4$
Gabbro	$10^3 - 10^6$
Basalt	$10 - 1.3 \times 10^7$ (dry)
Olivine norite	$10^3 - 6 \times 10^4$ (wet)
Peridotite	3×10^3 (wet) – 6.5×10^3 (dry)
Hornfels	8×10^3 (wet) – 6×10^7 (dry)
Schists (calcareous and mica)	$20 - 10^4$
Tuffs	2×10^3 (wet) – 10^5 (dry)
Graphite schist	$10 - 10^2$
Slates (various)	$6 \times 10^2 - 4 \times 10^7$
Gneiss (various)	6.8×10^4 (wet) – 3×10^6 (dry)
Marble	$10^2 - 2.5 \times 10^8$ (dry)
Skarn	2.5×10^2 (wet) – 2.5×10^8 (dry)
Quartzites (various)	$10 - 2 \times 10^8$
Consolidated shales	$20 - 2 \times 10^3$
Argillites	$10 - 8 \times 10^2$
Conglomerates	$2 \times 10^3 - 10^4$
Sandstones	$1 - 6.4 \times 10^8$
Limestones	$50 - 10^7$
Dolomite	$3.5 \times 10^2 - 5 \times 10^3$
Unconsolidated wet clay	20
Marls	3 – 70
Clays	1 – 100
Oil sands	4 – 800

Type	Susceptibility × 10^3 (SI) Range	Average
Sedimentary		
Dolomite	0 – 0.9	0.1
Limestones	0 – 3	0.3
Sandstones	0 – 20	0.4
Shales	0.01 – 15	0.6
Av. 48 sedimentary	0 – 18	0.9
Metamorphic		
Amphibolite		0.7
Schist	0.3 – 3	1.4
Phyllite		1.5
Gneiss	0.1 – 25	
Quartzite		4
Serpentine	3 – 17	
Slate	0 – 35	6
Av. 61 metamorphic	0 – 70	4.2
Igneous		
Granite	0 – 50	2.5
Rhyolite	0.2 – 35	
Dolorite	1 – 35	17
Augite-syenite	30 – 40	
Olivine-diabase		25
Diabase	1 – 160	55
Porphyry	0.3 – 200	60
Gabbro	1 – 90	70
Basalts	0.2 – 175	70
Diorite	0.6 – 120	85
Pyroxenite		125
Peridotite	90 – 200	150
Andesite		160
Av. acidic igneous	0 – 80	8
Av. basic igneous	0.5 – 97	25
Minerals		
Graphite		0.1
Quartz		−0.01
Rock salt		−0.01
Anhydrite, gypsum		−0.01
Calcite	−0.001 – −0.01	
Coal		0.02
Clays		0.2
Chalcopyrite		0.4
Sphalerite		0.7
Cassiterite		0.9
Siderite	1 – 4	
Pyrite	0.05 – 5	1.5
Limonite		2.5
Arsenopyrite		3
Hematite	0.5 – 35	6.5
Chromite	3 – 110	7
Franklinite		430
Pyrrhotite	1 – 6000	1500
Ilmenite	300 – 3500	1800
Magnetite	1200 – 19200	6000

Telford et al. (1990)

List of Costs

2011 Statement of Costs

Lightning Creek Geophysical Program

Project Conducted from May 27 to May 28 2011

Date	Item	Contractor	Description	Days	Km	Item Cost	Total
27.05 - 28.05.2011	Geophysical Lines	Arctic Geophysics Inc.	Field Crew (2 people)	2,0		$1.050,00	$2.100,00
	Motel Charges	Troll Resort Ltd. (Arctic)	Accommodation				$537,60
	Mob Demob	Arctic Geophysics Inc.	Dawson YT- Quesnel BC - Dawson YT			$7.115,45	$7.115,45
	Transportation	Arctic Geophysics Inc.	Vehcile	3,0		$50,00	$150,00
			Kilometers		20,0	$0,65	$13,00
Sub-Total							**$9.916,05**

Report				Total
Data	Arctic Geophysics Inc.	Data processing, interpretation		$2.200,00
Report	Arctic Geophysics Inc.	Report Preparation		$787,50
Report	Arctic Geophysics Inc.	Printing, binding, shipping		$50,00
Sub-Total				**$3.287,50**

Total Value of Work	**$12.953,55**

Total Person Days = 4

GPS-Data

Electrode No.	Location in Profile [m]	GPS Coordinates UTM Zone 10 WGS 1984	GPS Accuracy [m]	Post
1	0	569241 5878621	5	*
2	5	569244 5878619	5	
3	10	569247 5878616	5	
4	15	569250 5878613	5	
5	20	569253 5878610	5	
6	25	569255 5878606	5	
7	30	569257 5878602	5	
8	35	569260 5878598	5	
9	40	569265 5878595	5	
10	45	569263 5878595	5	
11	50	569267 5878592	5	
12	55	569270 5878588	5	
13	60	569273 5878585	5	
14	65	569276 5878582	5	
15	70	569278 5878578	5	
16	75	569282 5878575	5	
17	80	569286 5878571	5	
18	85	569289 5878567	5	
19	90	569292 5878562	5	
20	95	569295 5878558	5	
21	100	569297 5878554	5	
22	105	569300 5878551	5	
23	110	569302 5878546	5	
24	115	569305 5878542	5	
25	120	569308 5878538	5	
26	125	569313 5878535	5	*
27	130	569316 5878532	5	
28	135	569319 5878527	5	
29	140	569322 5878524	5	
30	145	569325 5878521	5	
31	150	569329 5878517	5	
32	155	569332 5878514	5	
33	160	569335 5878510	5	
34	165	569337 5878506	5	
35	170	569342 5878502	5	
36	175	569345 5878498	5	
37	180	569349 5878495	5	
38	185	569352 5878493	5	
39	190	569355 5878490	5	
40	195	569358 5878487	5	
41	200	569361 5878484	5	
42	205	569364 5878481	5	
43	210	569367 5878477	5	
47	230	569370 5878474	5	
48	235	569372 5878469	5	
49	240	569376 5878466	5	
50	245	569379 5878463	5	
51	250	569382 5878460	5	
52	255	569384 5878456	5	
53	260	569387 5878454	5	
54	265	569392 5878446	5	*
55	270	569394 5878442	5	
56	275	569397 5878439	5	
57	280	569400 5878433	5	
58	285	569406 5878430	5	
59	290	569407 5878427	5	
60	295	569408 5878422	5	
61	300	569411 5878419	5	
62	305	569412 5878414	5	
63	310	569414 5878411	5	
64	315	569415 5878406	5	
65	320	569418 5878403	5	
66	325	569418 5878398	5	
67	330	569426 5878395	5	
68	335	569428 5878391	5	
69	340	569433 5878391	5	
70	345	569435 5878389	5	
71	350	569438 5878388	5	
72	355	569440 5878375	5	
73	360	569442 5878372	5	
74	365	569450 5878369	5	
75	370	569452 5878362	5	
76	375	569453 5878360	5	
77	380	569459 5878357	5	
78	385	569458 5878353	5	
79	390	569462 5878349	5	*
80	395	569464 5878346	5	
81	400	569472 5878336	5	
82	405	569469 5878337	5	
83	410	569469 5878334	5	
84	415	569471 5878330	5	
85	420	569472 5878324	5	
86	425	569477 5878326	5	
87	430	569481 5878322	5	
88	435	569484 5878320	5	
89	440	569487 5878319	5	
90	445	569487 5878315	5	
91	450	569491 5878312	5	
92	455	569494 5878309	5	
93	460	569497 5878303	5	

Electrode No.	Location in Profile [m]	GPS Coordinates UTM Zone 10 WGS 1984	GPS Accuracy [m]	Post
94	465	569498 5878298	5	
95	470	569503 5878300	5	
96	475	569505 5878294	5	
97	480	569507 5878292	5	
98	485	569509 5878288	5	
99	490	569514 5878282	5	
100	495	569517 5878278	5	
101	500	569522 5878276	5	
102	505	569523 5878271	5	
103	510	569523 5878267	5	
104	515	569524 5878262	5	*
105	520	569535 5878264	5	
106	525	569541 5878259	5	
107	530	569540 5878255	5	
108	535	569543 5878251	5	
109	540	569546 5878249	5	
110	545	569551 5878247	5	
111	550	569550 5878240	5	
112	555	569552 5878236	5	
113	560	569554 5878234	5	
114	565	569557 5878230	5	
115	570	569559 5878228	5	
116	575	569561 5878225	5	
117	580	569563 5878217	5	
118	585	569563 5878210	5	
119	590	569571 5878207	5	
120	595	569575 5878198	5	
121	600	569581 5878202	5	
122	605	569584 5878198	5	
123	610	569587 5878196	5	
124	615	569594 5878197	5	
125	620	569597 5878189	5	
126	625	569603 5878181	5	
127	630	569601 5878184	5	
128	635	569602 5878181	5	
129	640	569608 5878176	5	*
130	645	569608 5878171	5	
131	650	569616 5878165	5	
132	655	569616 5878164	5	
133	660	569624 5878150	5	
134	665	569628 5878146	5	
135	670	569630 5878142	5	
136	675	569635 5878138	5	
137	680	569641 5878141	5	
138	685	569643 5878131	5	
139	690	569641 5878127	5	
140	695	569645 5878124	5	
141	700	569649 5878119	5	
142	705	569655 5878112	5	
143	710	569658 5878107	5	
144	715	569659 5878106	5	
145	720	569663 5878104	5	
146	725	569663 5878101	5	
147	730	569669 5878099	5	
148	735	569669 5878093	5	
149	740	569672 5878084	5	
150	745	569677 5878084	5	
151	750	569676 5878072	5	*
152	755	569680 5878069	5	
153	760	569684 5878069	5	
154	765	569692 5878065	5	
155	770	569699 5878062	5	
156	775	569699 5878060	5	
157	780	569703 5878057	5	
158	785	569702 5878050	5	
159	790	569706 5878055	5	
160	795	569709 5878051	5	
161	800	569707 5878040	5	
162	805	569713 5878037	5	
163	810	569716 5878032	5	
164	815	569727 5878024	5	
165	820	569727 5878026	5	
166	825	569725 5878023	5	
167	830	569731 5878021	5	
168	835	569734 5878013	5	
169	840	569738 5878012	5	
170	845	569744 5878014	5	
171	850	569750 5878003	5	
172	855	569749 5878003	5	
173	860	569749 5877996	5	
174	865	569752 5877987	5	
175	870	569754 5877982	5	*