



**Kaminak Gold Corporation**

**EXPLORATION REPORT ON THE COFFEE  
CREEK PLACER PROSPECTING LEASE**

Whitehorse, Yukon Territory  
Lease No.: IW00480 – Tim Smith 100%

NTS # 115J/14  
Latitude: 62.880°N Longitude: 139.097°W

Whitehorse Mining District

WORK PERFORMED: September 20-30<sup>th</sup>, 2017  
DATE OF REPORT: Oct 2<sup>nd</sup>, 2017

-prepared by-

Tim Smith, M.Sc., P.Geo.



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## **1.0 SUMMARY**

Between September 20<sup>th</sup>, 2017 and September 30<sup>th</sup>, 2017, a ground geophysics program was implemented on the Coffee Creek placer lease IW00480. The purpose of the program was to employ a ground penetrating radar unit (GPR) to determine thickness of sediment, regions of limited permafrost and bedrock features that would be conducive to trapping alluvial placer gold.

## **2.0 LOCATION AND ACCESS**

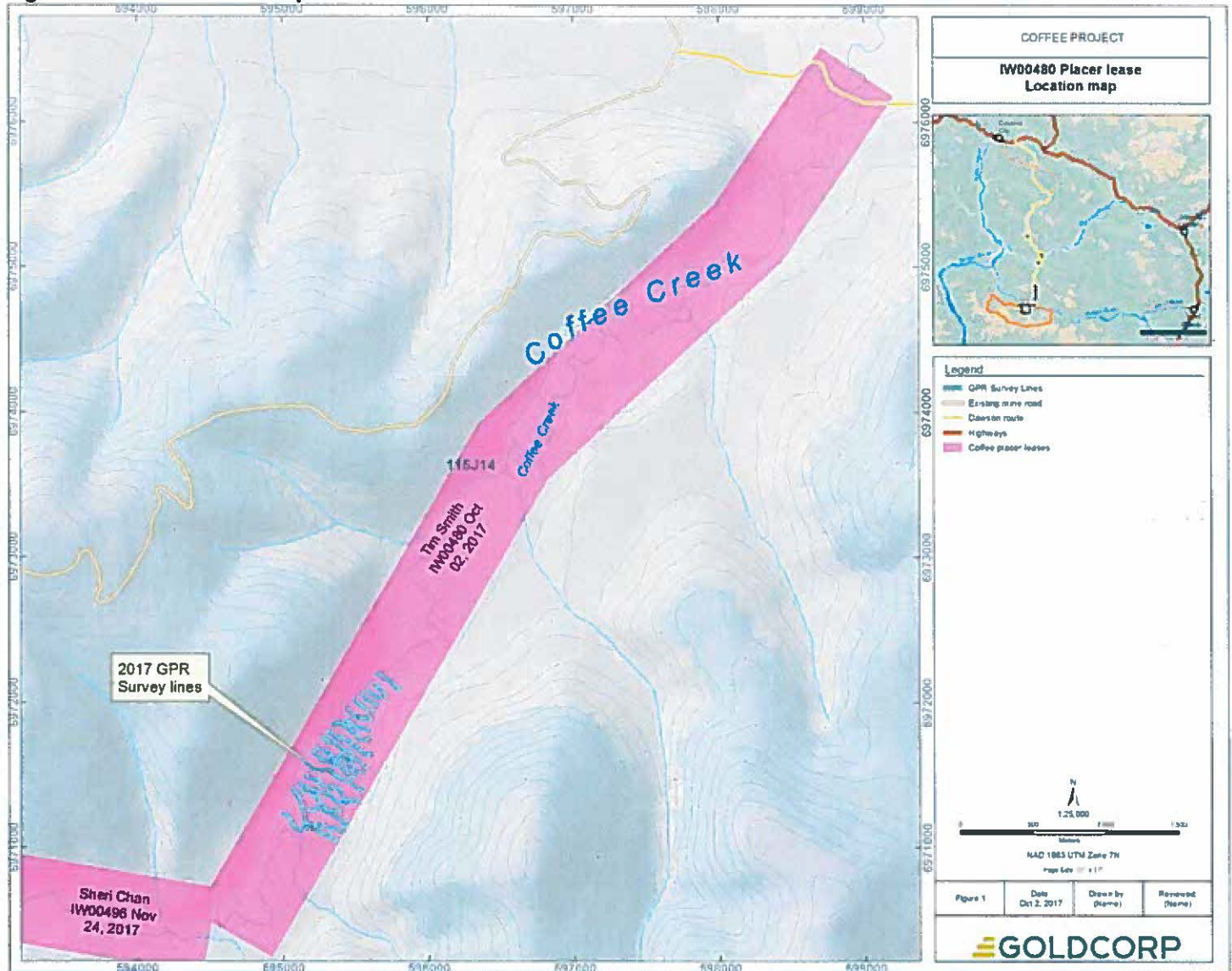
The Prospecting lease is located 120km south of Dawson City, within Coffee Creek which feeds into the Yukon River drainage system in the west-central portion of the Yukon Territory. It is centered at 62.880°N, 139.097° W on NTS map sheet 115J/14 (Figure 1). It is accessible year round via helicopter or fixed wing into the Coffee Camp and land or river transport from that site. There is also a barge landing accessing the Coffee Camp, which allows for access to heavy/bulky equipment.

## **3.0 HISTORY**

Kaminak Gold Corporation ("Kaminak") acquired the IW00480 prospecting lease October 2<sup>nd</sup>, 2015. Previous exploration on this lease included an airborne Midas magnetics survey, a digital topographic survey and IP/Resistivity survey. Kaminak was acquired by Goldcorp Inc. ("Goldcorp") on July 19, 2016, and is now a wholly owned subsidiary of Goldcorp.



**Figure 1 - Lease location map**





#### 4.0 PHYSIOLOGY AND GEOLOGY

Placer lease IW00480 is situated within Kaminak's Coffee property (Figure 2) which is located in the Yukon-Tanana Terrane (YTT), an accreted pericratonic rock sequence that covers a large portion of the Omineca Belt in the Yukon and extends into Alaska and British Columbia.

The Coffee Gold property is underlain by a package of Paleozoic felsic to mafic gneisses and schists that were subsequently intruded by a large granitic body in the Late Cretaceous. Gold mineralization is hosted within tectonically late (post-Cretaceous) steeply-dipping structures that cross-cut all rock units on the property. These structural corridors are characterized by brecciation, the addition of pyrite, silica-sericite-clay alteration, and arsenic-antimony enrichment. High-grade intervals are associated with polyphase breccia, microbreccia, quartz vein breccia, hydrothermal muscovite sericite and high sulphide content. Felsic to intermediate dykes are commonly observed to be spatially associated with mineralization within the gold-bearing structures, however these dykes pre-date mineralization and to date no post-mineral dykes nor faults exhibiting displacement/offset of mineralization have been identified.

Coffee contains a NI 43-101 Indicated resource (inclusive of reserves) of 63.7Mt at 1.45g/t Au for 2,968,000oz Au, and an Inferred resource of 52.4Mt at 1.31g/t Au for 2,212,000oz Au. (Resource cut-off grade limits are 0.3 g/t Au for Oxide and Upper Transitional, 0.4 g/t Au for Middle Transitional and 1.0 g/t Au for Lower Transitional and Sulphide resources.)

The Coffee deposit occurs under a thin (0-2m) soil and colluvial cover. Placer deposits formed from the eroded remnants of the Coffee deposit have not been previously identified. Although weak stream sediment gold-arsenic anomalism played a part in the discovery of Coffee, there is no historic recorded placer production from the creeks draining the Coffee Deposit, even though the district includes several recent and currently producing creeks including Thistle, Kirkman and Ballarat creeks to the north, and Canadian and Britannia Creeks to the east. This lack of placer mining in the Coffee area has previously been interpreted as being due to the extremely fine grained deportment of gold within the Coffee deposit, which in the sulphide ore is refractory, and in the oxide ore occurs as nano-particles of native gold ranging from <1-10 microns. Therefore gold is only visible via scanning electron microscope, geochemically detectable via modern geochemical laboratory techniques such as fire assay, and commercially recoverable via cyanidation processing. Gravity separation methods typical of the placer mining industry in the Yukon are not thought to be viable, however it could potentially be feasible to extract placer or eluvial gold deposits at the proposed Coffee Gold Project heap leach facility if sufficient tonnage and grade was identified.



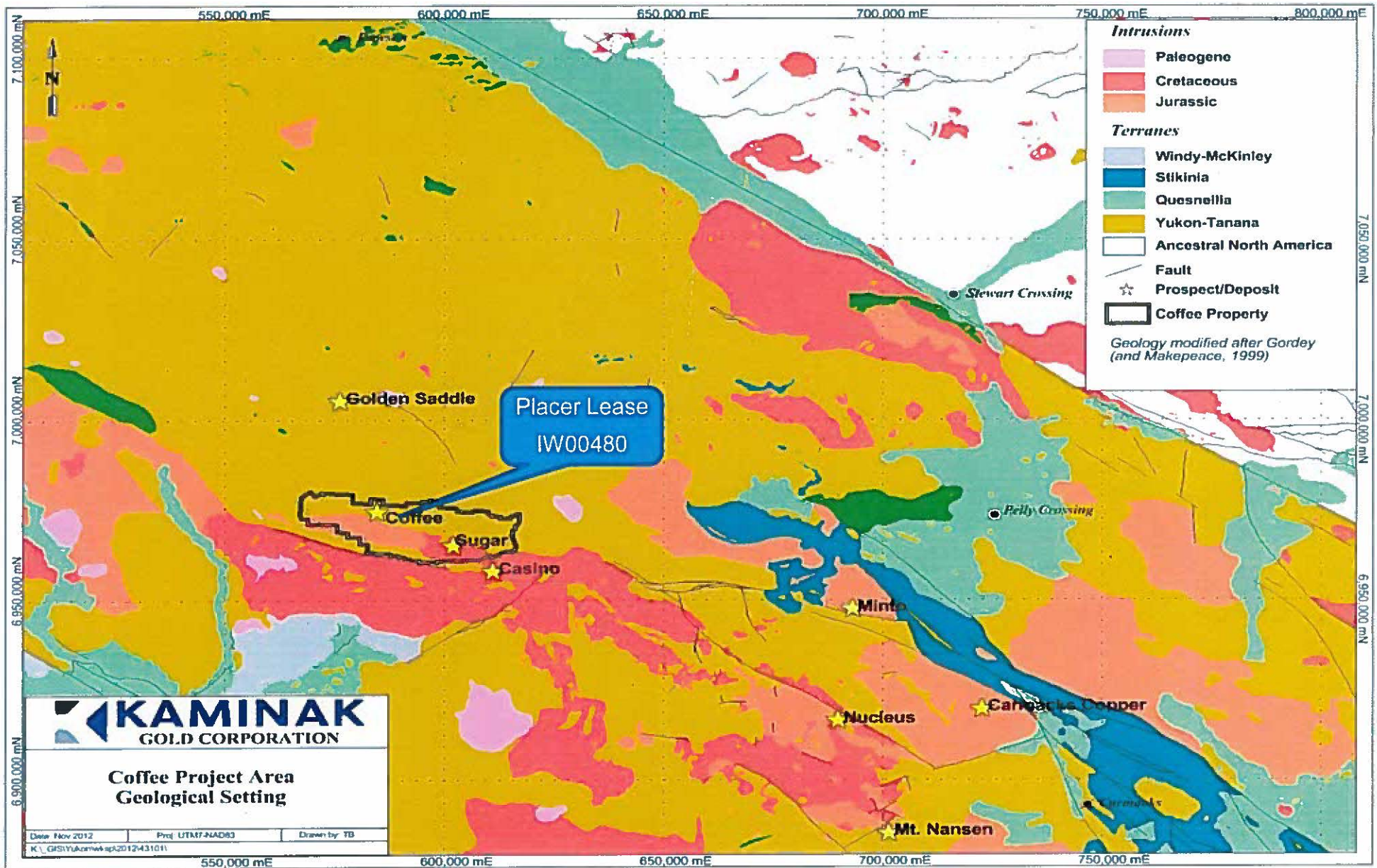


Figure 2 - Geological Setting of the Coffee Project Area

(Modified after Gordey and Makepeace, 1999)



## 5.0 GEOPHYSICS PROGRAM

Aurora Geosciences was contracted to carry out the GPR survey along prospective profile lines within the placer lease (Figure 1).

### Theory:

Ground penetrating radar is a geophysical technique that produces images of the ground called radargrams. The instrument consists of a transmitter and receiver which are carried or towed by operators.

A wideband radio pulse is emitted by the transmitter at a peak frequency correlating to the length of the transmitter antenna. As the frequency increases, resolution improves, but depth of penetration is reduced. This pulse travels both through the air and through the ground to arrive at the receiver antenna some nanoseconds later.

The pulse that travels through the air travels at the speed of light in air and arrives first. This early arrival is called the 'air wave'. This signal is not particularly useful except as a means of confirming that the instrument is working as expected.

If the transmitter and receiver antenna are located on the ground, a portion of the radio signal will enter the ground. This signal travels at a lower speed than the air wave, typically on the order of two to five times slower. In the absence of calibration data, a factor of three is commonly assumed. The speed of travel of radio waves in geologic materials depends primarily on a physical property called the 'dielectric constant'. The following table provides some values for dielectric constants of materials expected to be present at this claim (Telford et al., Applied Geophysics, 1976):

Material	Dielectric constant
Air	1
Water	80
Ice	3 – 4.3
Packed sand (dry to moist)	2.9 – 105
Clays (dry to moist)	7 – 43

As the radio pulse travels through the geologic materials, it may encounter geologic interfaces where the value of the dielectric constant rapidly changes. For example, when leaving wet packed sand, and entering ground ice. When this happens, some of the radio energy is reflected back to the surface where it can be detected by the receiver antenna. By measuring the time between the signal being emitted by the transmitter and being detected by the receiver, and using an estimate for velocity, one can give an approximate depth to that interface.

### Equipment:

On the placer lease, Aurora used a Mala ProEx GPR system with three detachable rugged terrain antennas. These three antennas provide peak frequencies of 25 MHz, 50 MHz, and 100 MHz. It was determined that all three antennas would be used at this site to determine which frequency was optimal for future exploration on this claim.

Coordinates were collected simultaneously by a Garmin GPSmap 78s handheld GPS. These coordinates were fed into the GPR system by serial cable. The accuracy of these handheld GPS devices



on open ground is typically on the order of 3 metres. However, due to the mountainous terrain, the positional accuracy may be reduced. Additionally, in places where no GPS signal was available, coordinates are interpolated between known points assuming a constant travel velocity.

**Logistics:**

Logistical support for this survey were provided by Goldcorp. Aurora personnel were mobilized by chartered aircraft to Coffee Camp, an exploration camp run by Goldcorp in support of their Coffee Gold Project. Coffee Camp provided a heated sleeper tent, electricity to charge the GPR equipment, and food.

Daily mobilization from Coffee Camp to the claim was performed by pickup truck and helicopter, both provided by Goldcorp. Communications with camp were by digital radio (Goldcorp) or satellite phone (Aurora).

**Survey:**

Goldcorp provided Aurora with a map of the claim boundary and ten proposed line locations. Aurora converted these to GPS coordinates for navigation on site.

On September 20, 2017, Ehssan Gheirati (Geophysical Technician, Aurora) arrived at the claim to scout the location. It was determined that the terrain was too rugged for a single operator to complete the survey. Quoting his nightly report: "The ground is very uneven and rough at some places. Having a helper would be necessary. There are lots of trees, dry branches and roots on the ground which will block the antenna from moving."

Troy Unrau (Project Geophysicist, Aurora; P.Geol. (NWT, Alberta)) arrived at Coffee Camp on September 21, 2017. He spent part of this day on equipment verification and testing, as well as reviewing maps and making logistical arrangements.

Surveying began on September 22, 2017 with one geophysicist and one technician. A total of 3.5 line-km of data were collected using the 50 MHz and 100 MHz antennas. An additional 1.5 line-km of data were collected using the 25 MHz antennas on September 23, 2017. This data covers four of the ten originally proposed lines. A map showing the location of the surveyed lines is included in [INSERT FIGURE NUMBER].

**Processing:**

GPR data was processed by Aurora on September 30, 2017. The following processes were applied to each line:

- Quality assurance check on GPS data (remove spurious data)
- Process GPR data in Relfexw
  - o Import raw data, apply GPS coordinates, calculate distances along line
  - o Dewow filter (20 ns window)
  - o Move start time so that air wave is at  $t = 0$  ns
  - o Apply gain (energy decay 1x)
  - o Make equidistant traces (0.5 m)
  - o Trim profiles to remove noise at depth
  - o Export to SEG-Y
- Plot profiles in Geosoft Oasis Montaj
  - o Import SEG-Y
  - o Create profile draped to elevation
  - o Create inset map showing line location
  - o Export figures as PNG



### **Appendix A: References**

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)



**Appendix B: Statement of Expenditures**



**AURORA GEOSCIENCES**

**STATEMENT OF EXPENDITURES**

**Ground Penetrating Radar Geophysics Survey**

**October 2, 2017**

**Coffee Creek (IW00480): Sept 25 - 26**

***GPR Survey***

Geophysicist and Field Hand (\$1,050/day) \$2,100.00

Mala GPR system w/ antennas, controller,  
monitor, GPS, laptop w/ software, inReach, office  
box, ancillary costs (\$1,235/day) \$2,470.00

\$4,570.00

***Report***

GPR data processing, figures and  
interpretation (10hrs @ \$75/hr) \$750.00

***Total*** \$750.00

**Total Project Costs** \$5,320.00



**Appendix C: Geologist Certificate**



## STATEMENT OF QUALIFICATIONS

**Tim Smith, Goldcorp Inc.**

I, Tim Smith, do hereby certify that:

1. I am the Exploration Manager, Coffee Project of:

Goldcorp Inc.  
Park Place  
#3100-666 Burrard Street  
Vancouver, BC, Canada V6C 2X8

2. I graduated from the University of Canterbury with a Bachelor of Science in Geology in 1992.
3. I obtained a Honours Master of Science in Geology from the University of Canterbury in 1994.
4. I am a Professional Geoscientist of the Association of Professional Engineers and Geoscientists of British Columbia, Licence Number 39506, and a Member of the Australian Institute of Geoscientists.
5. I have worked in the exploration industry continuously since 1994 and have been involved in mineral exploration Western Australia and the Northern Territory of Australia, and on the Coffee Gold Project in Yukon, Canada.
6. I compiled this report and portions therein.

Dated this 2<sup>nd</sup> day of October, 2017.

"original signed and sealed"

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Tim Smith, M.Sc., P.Geo.

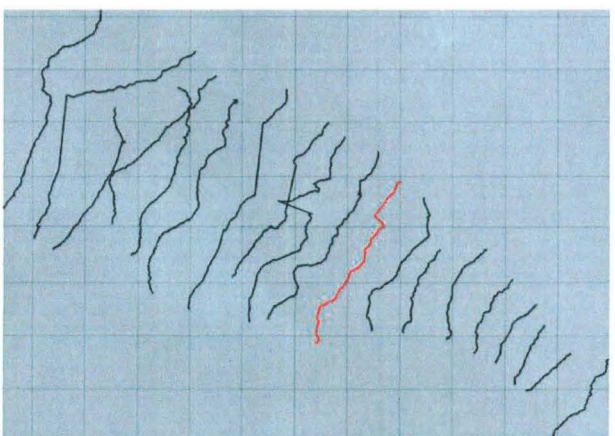
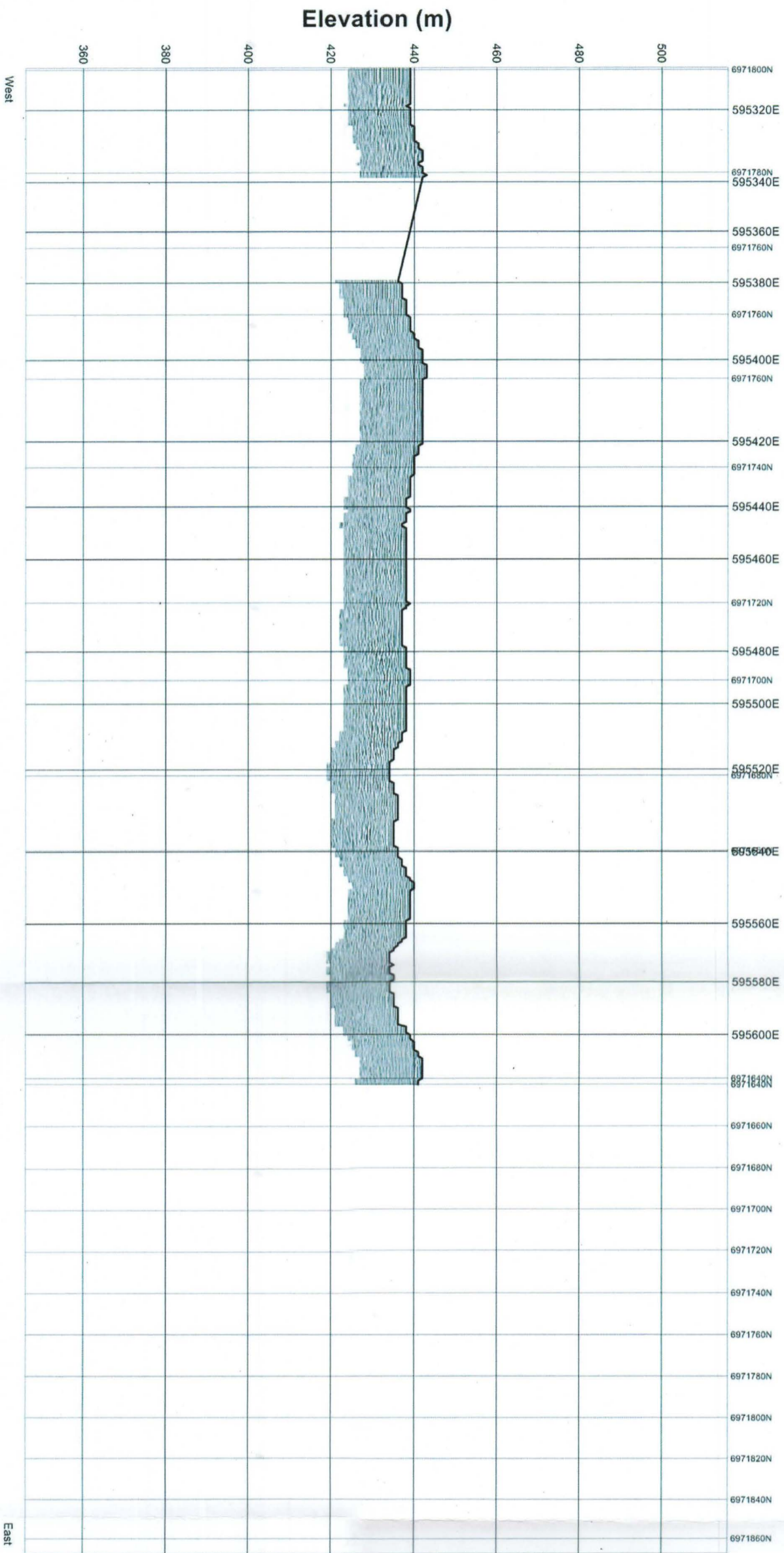


#### **Appendix D: Results and Interpretation**

GPR survey results are still in the process of being interpreted with preliminary prospective locations for next year's exploration program defined in the 2018 Work Program submission. GPR profile data provided below.



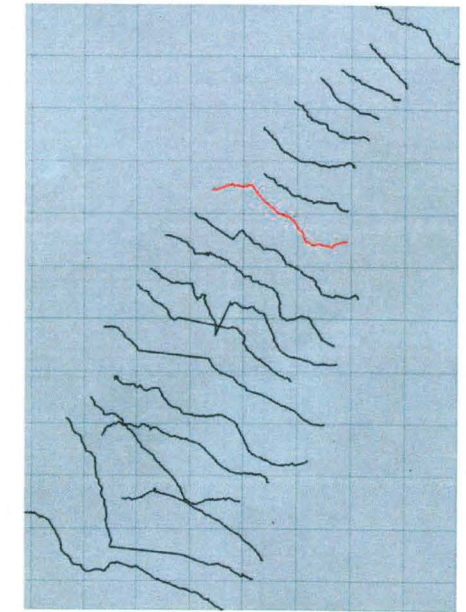
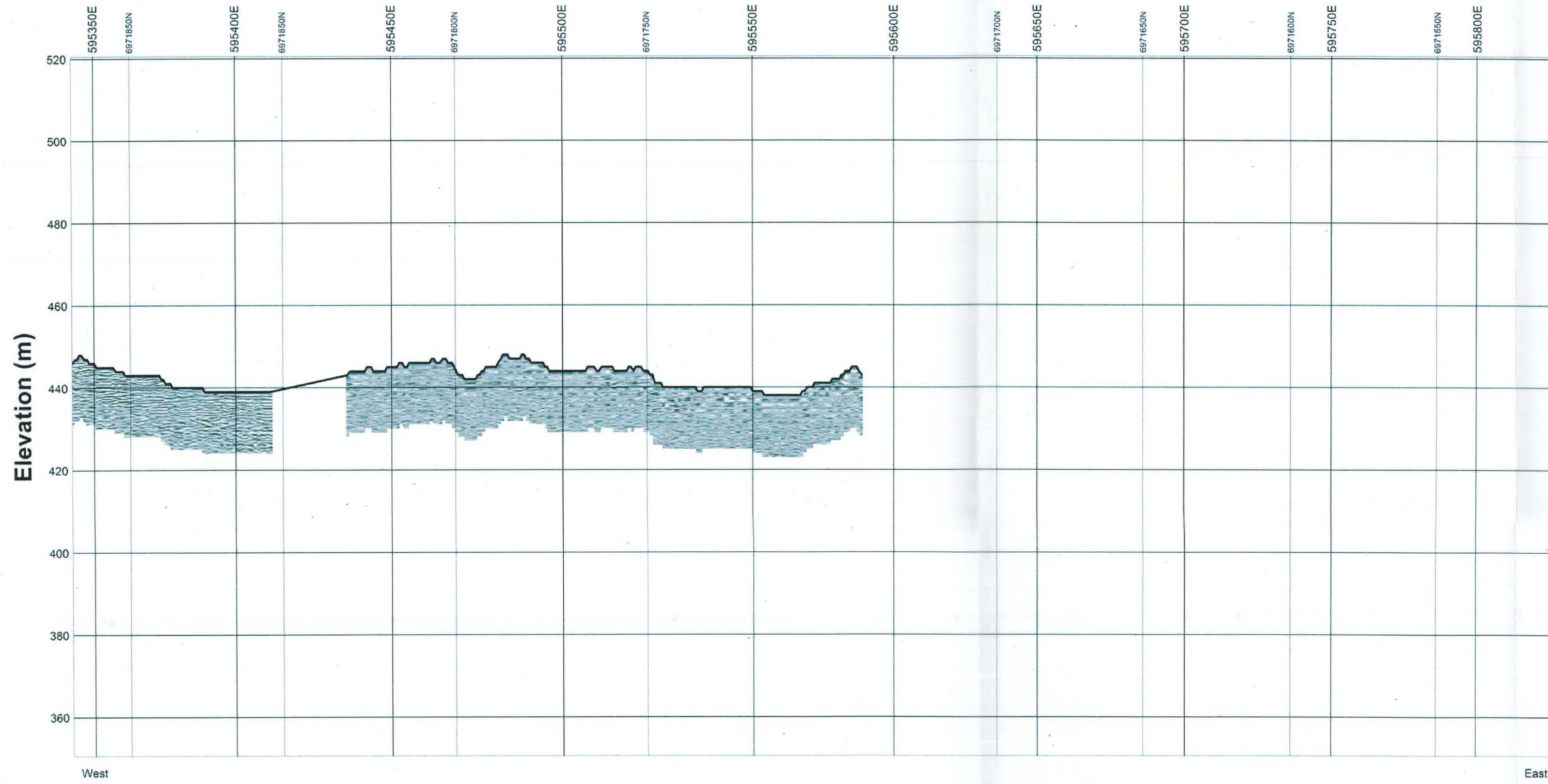
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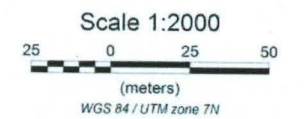
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for  
Goldcorp Inc.  
Placer claim: W000480  
Instrument: Mala ProX  
Antenna: 50 MHz Rugged Terrain Antenna  
Collected: 2017-09-25&26 by TU  
Processed: 2017-10-01 by TU

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Vertical Exaggeration: 2

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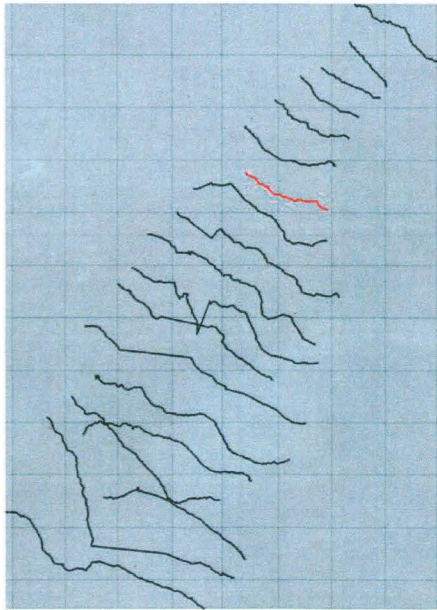
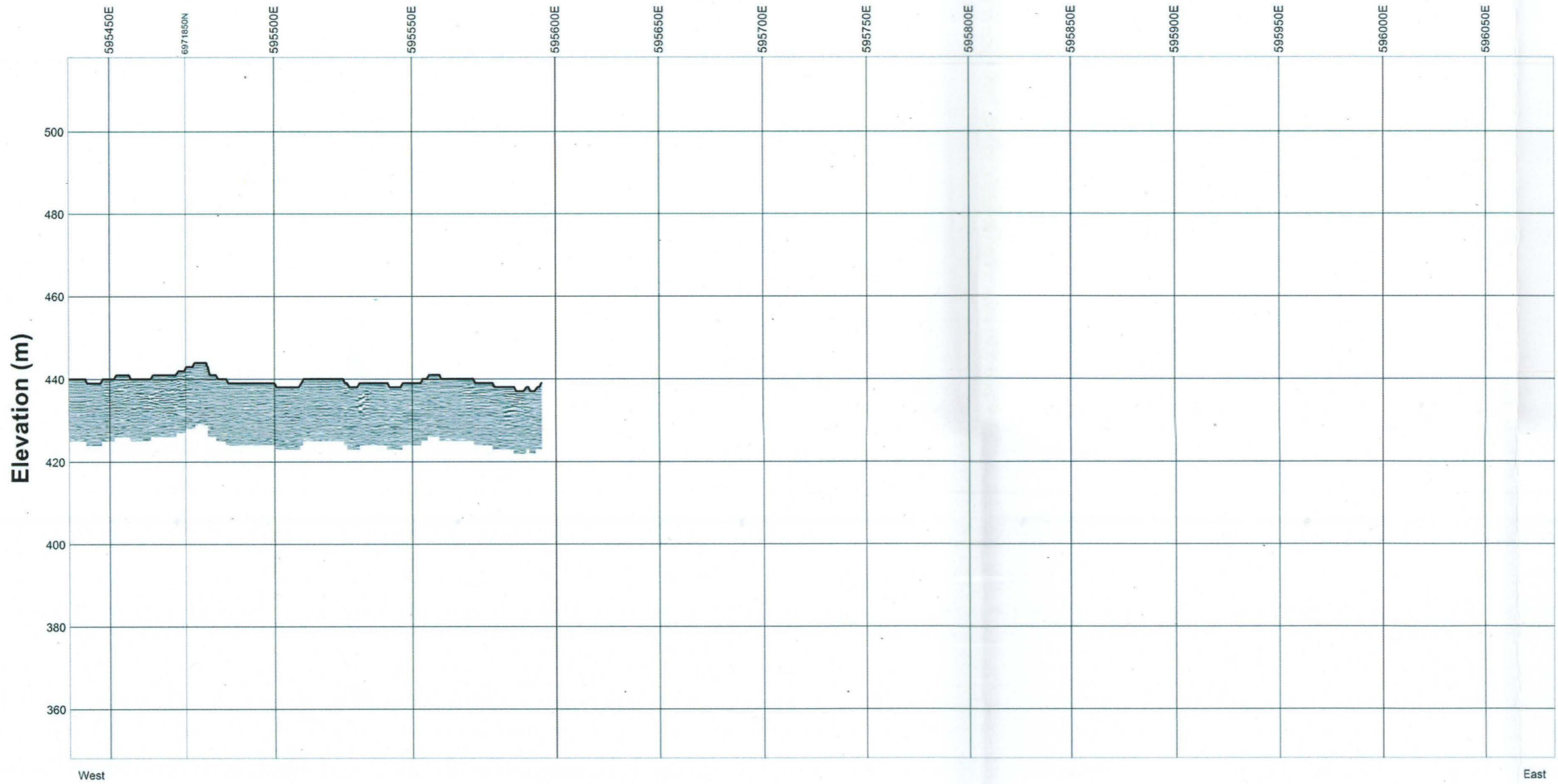


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for  
Goldcorp Inc.  
Placer claim: IW00480  
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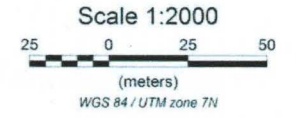


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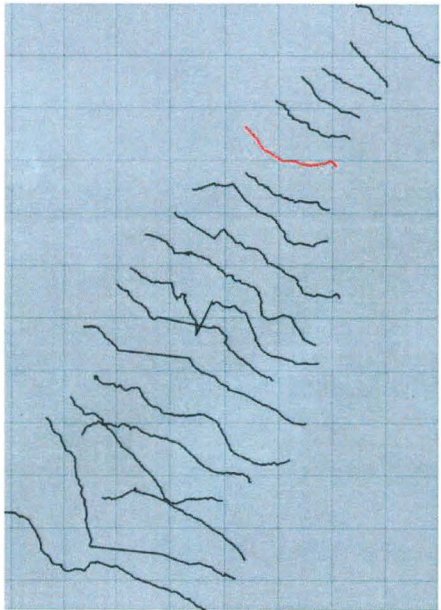
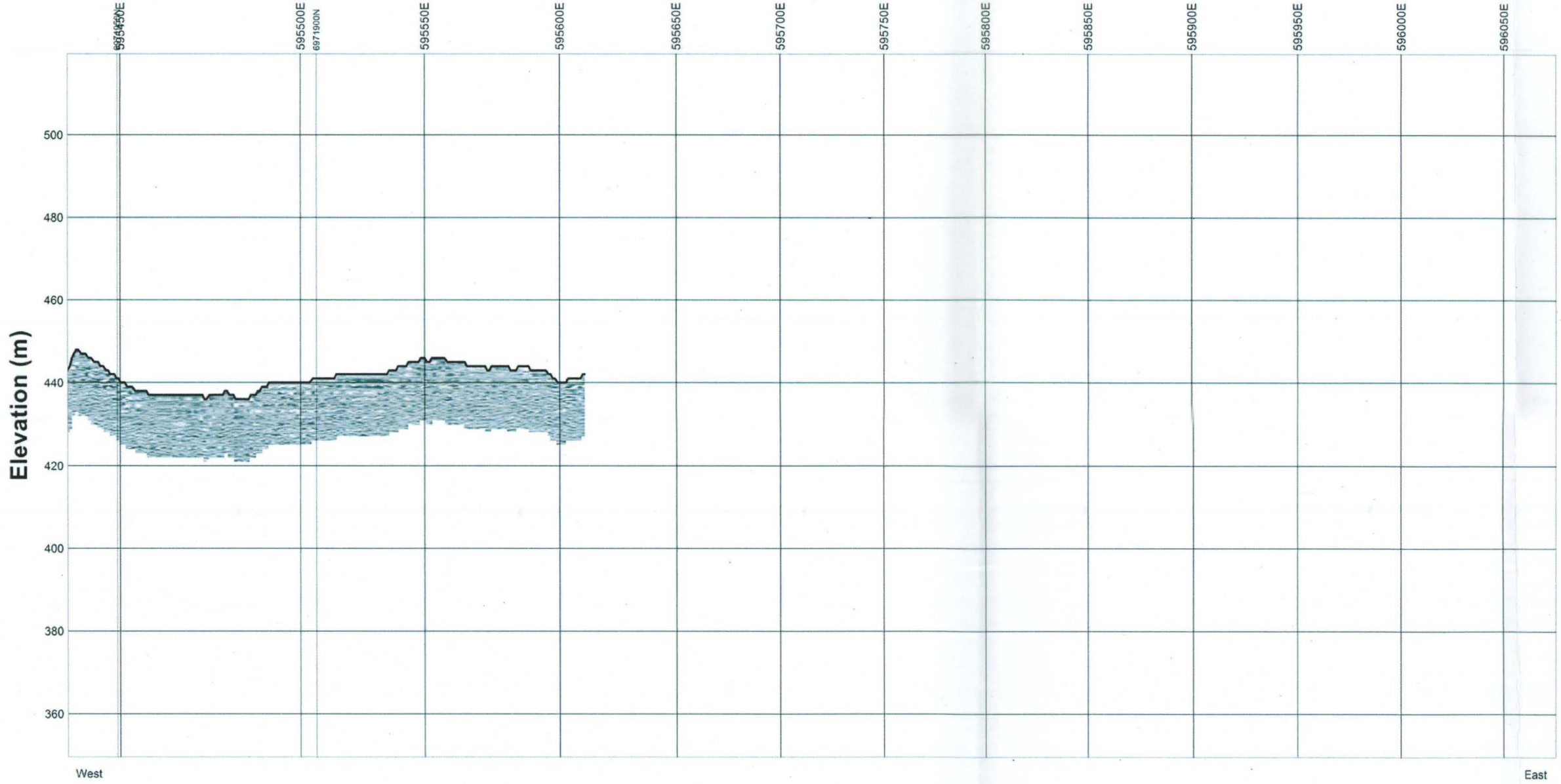


Aurora Geosciences Ltd.  
for  
Goldcorp Inc.  
Placer claim: IW00480  
Instrument: Mala ProX  
Antenna: 50 MHz Rugged Terrain Antenna  
Collected: 2017-09-25&26 by TU  
Processed: 2017-10-01 by TU



Vertical Exaggeration: 2

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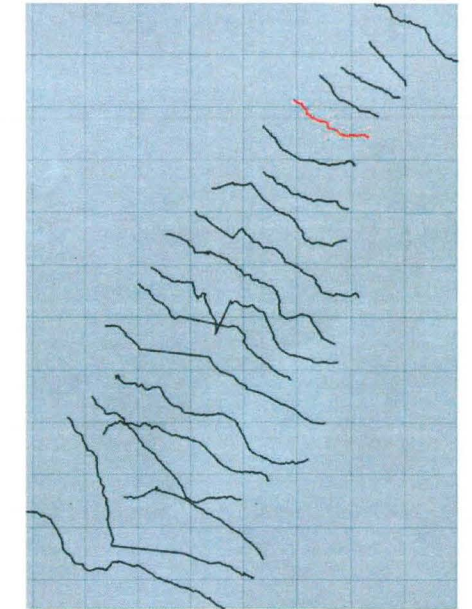
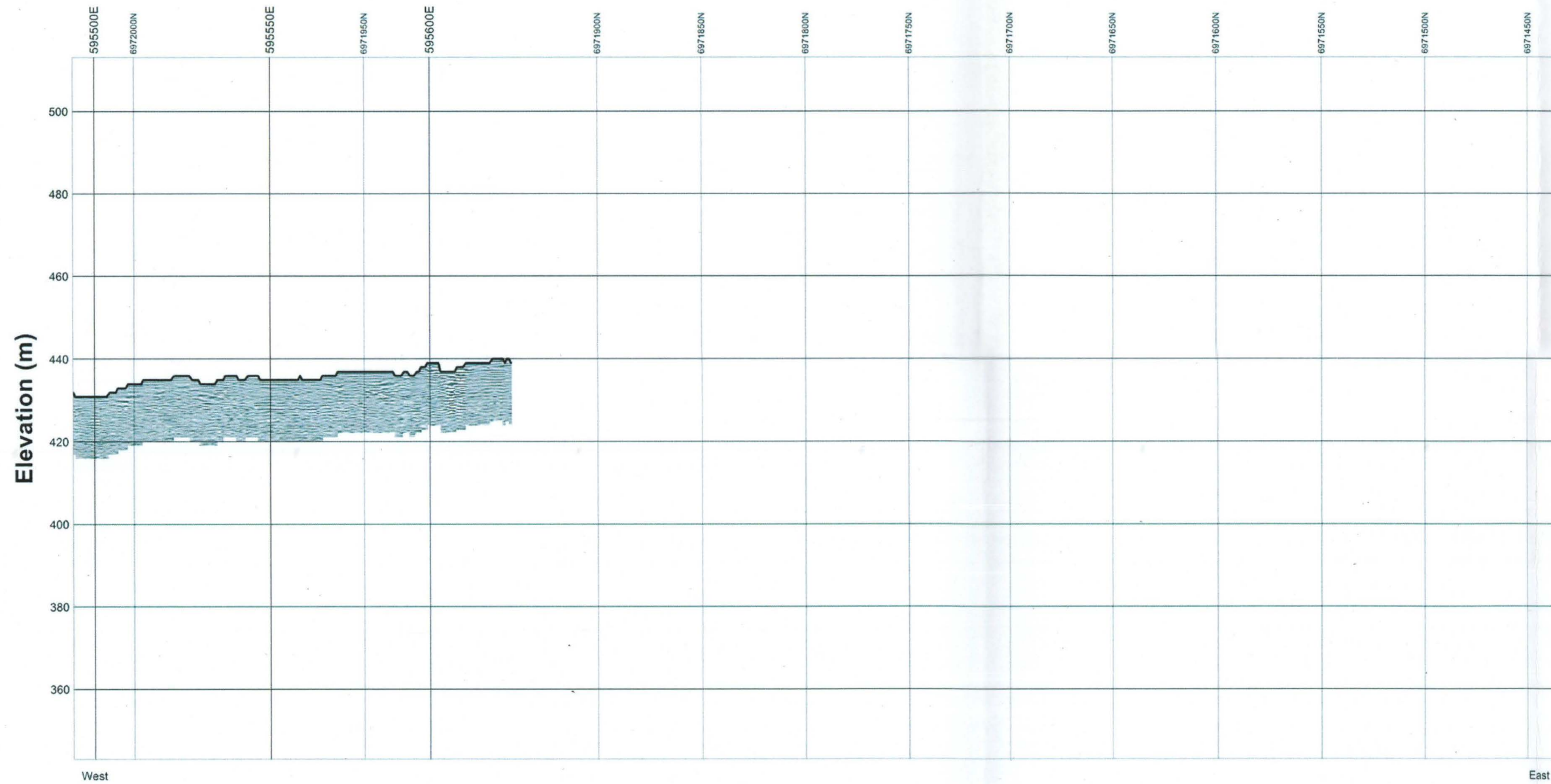
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for  
Goldcorp Inc.  
Placer claim: IW00480  
Instrument: Mala ProX  
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Processed: 2017-10-01 by TU

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WGS 84 / UTM zone 7N

Vertical Exaggeration: 2

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for  
Goldcorp Inc.

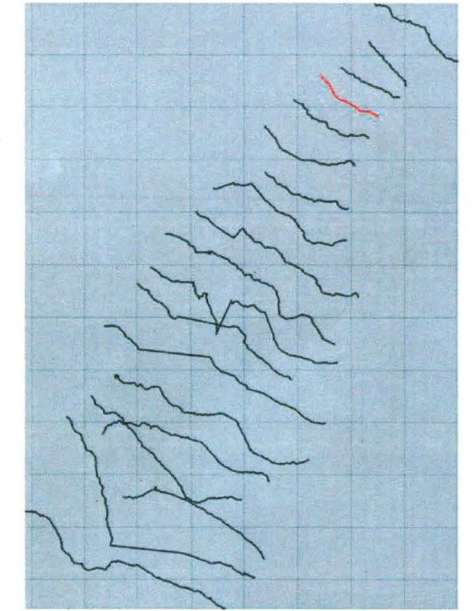
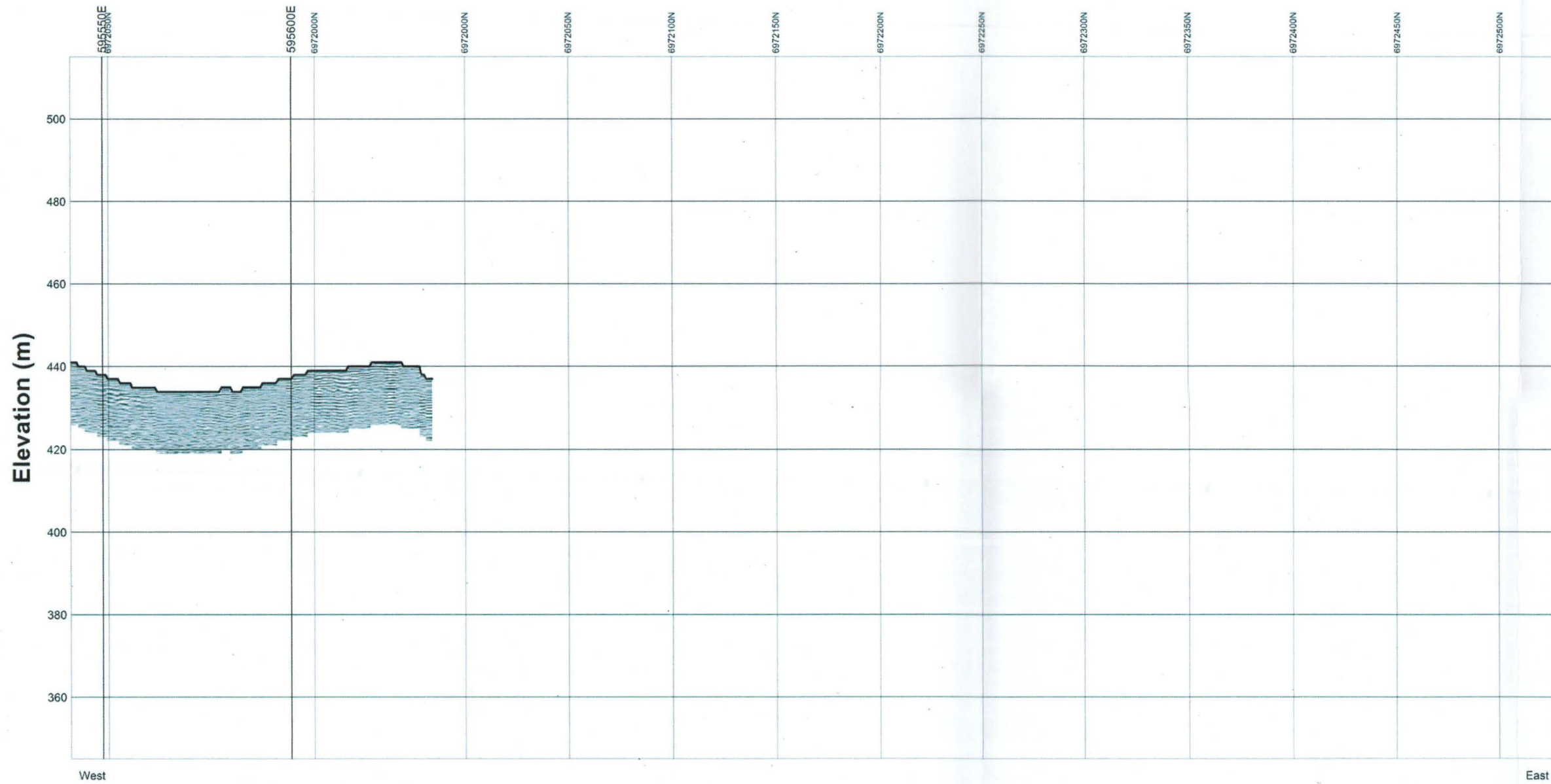
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WGS 84 / UTM zone 7N

Vertical Exaggeration: 2

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for  
Goldcorp Inc.

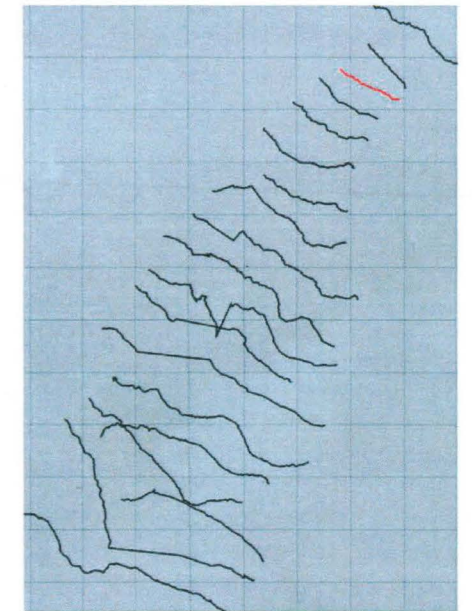
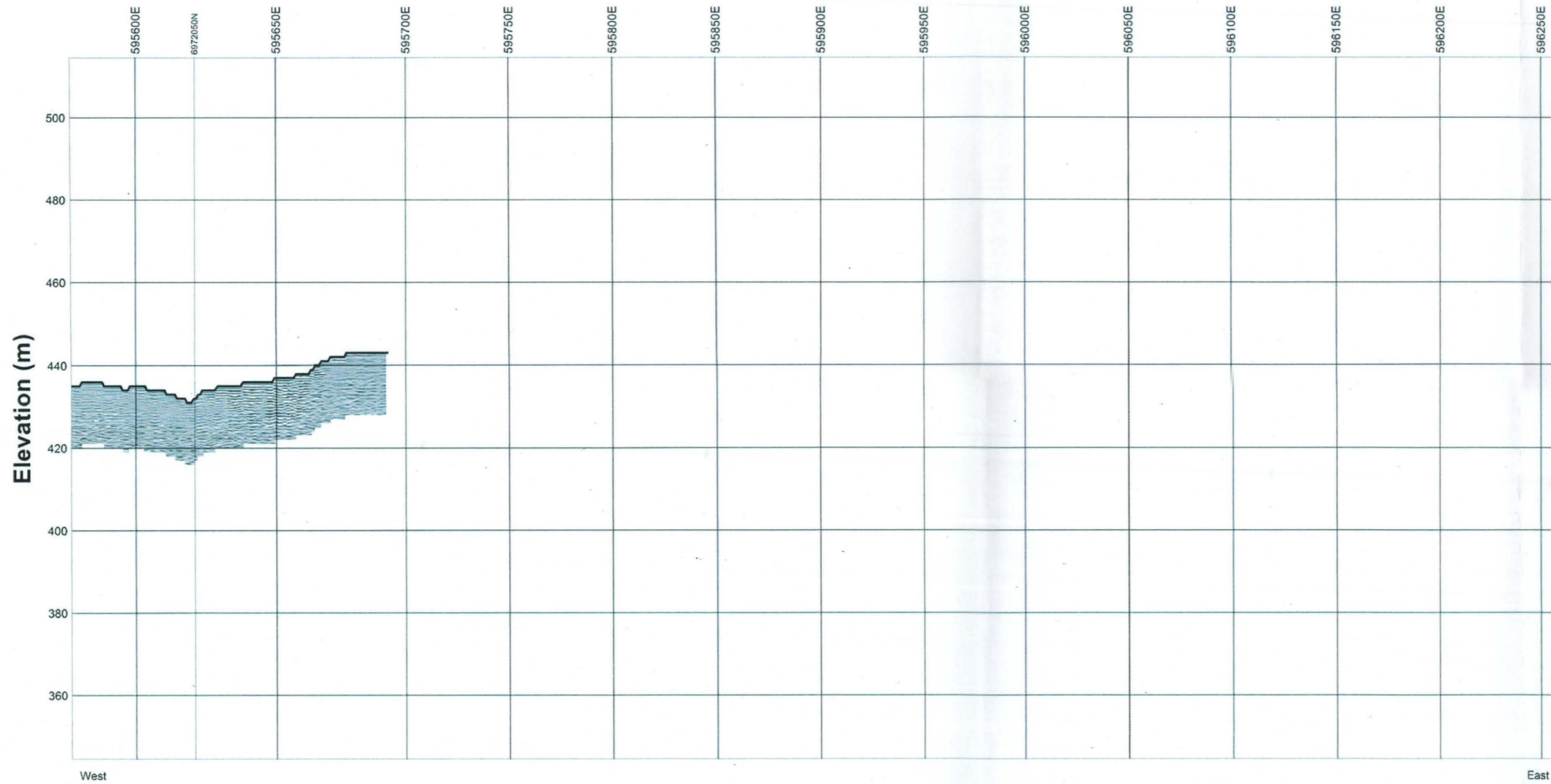
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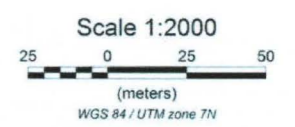
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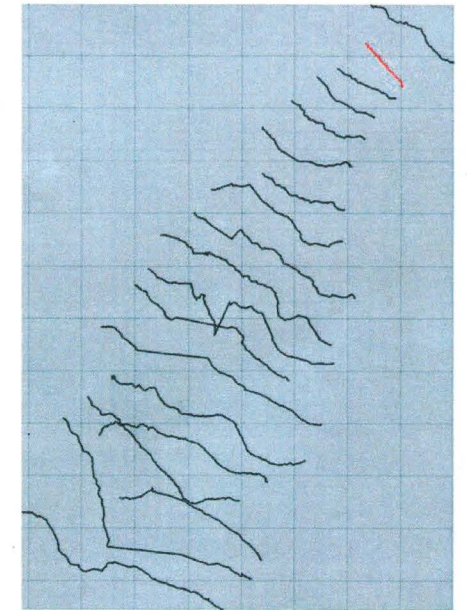
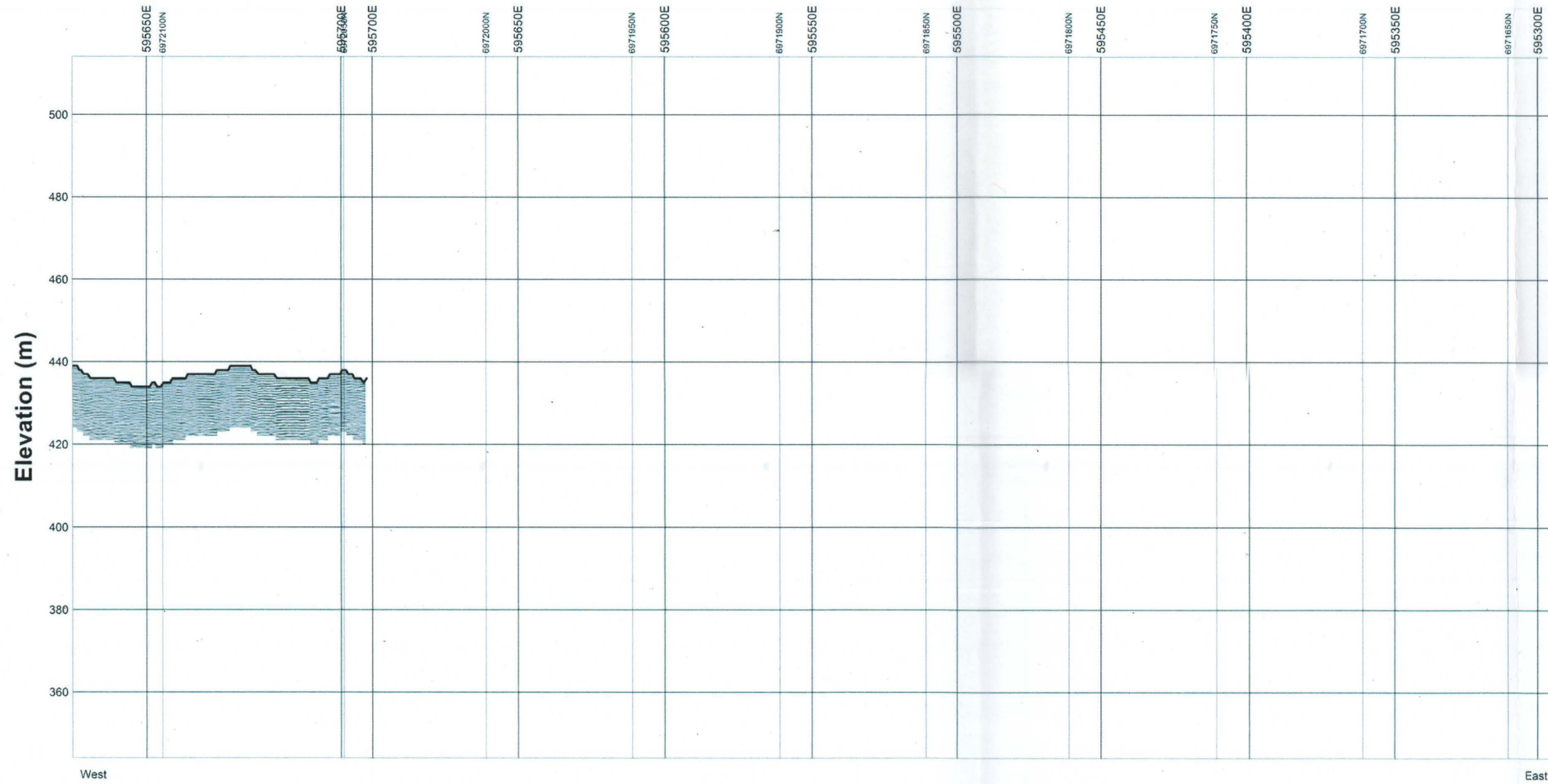


Aurora Geosciences Ltd.  
for  
Goldcorp Inc.  
Placer claim: IW00480  
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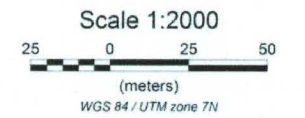


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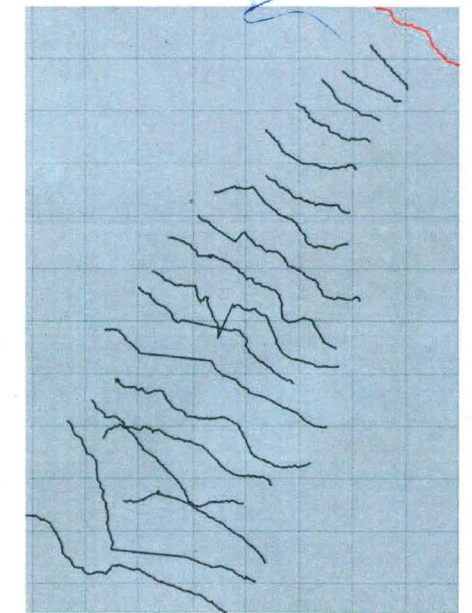
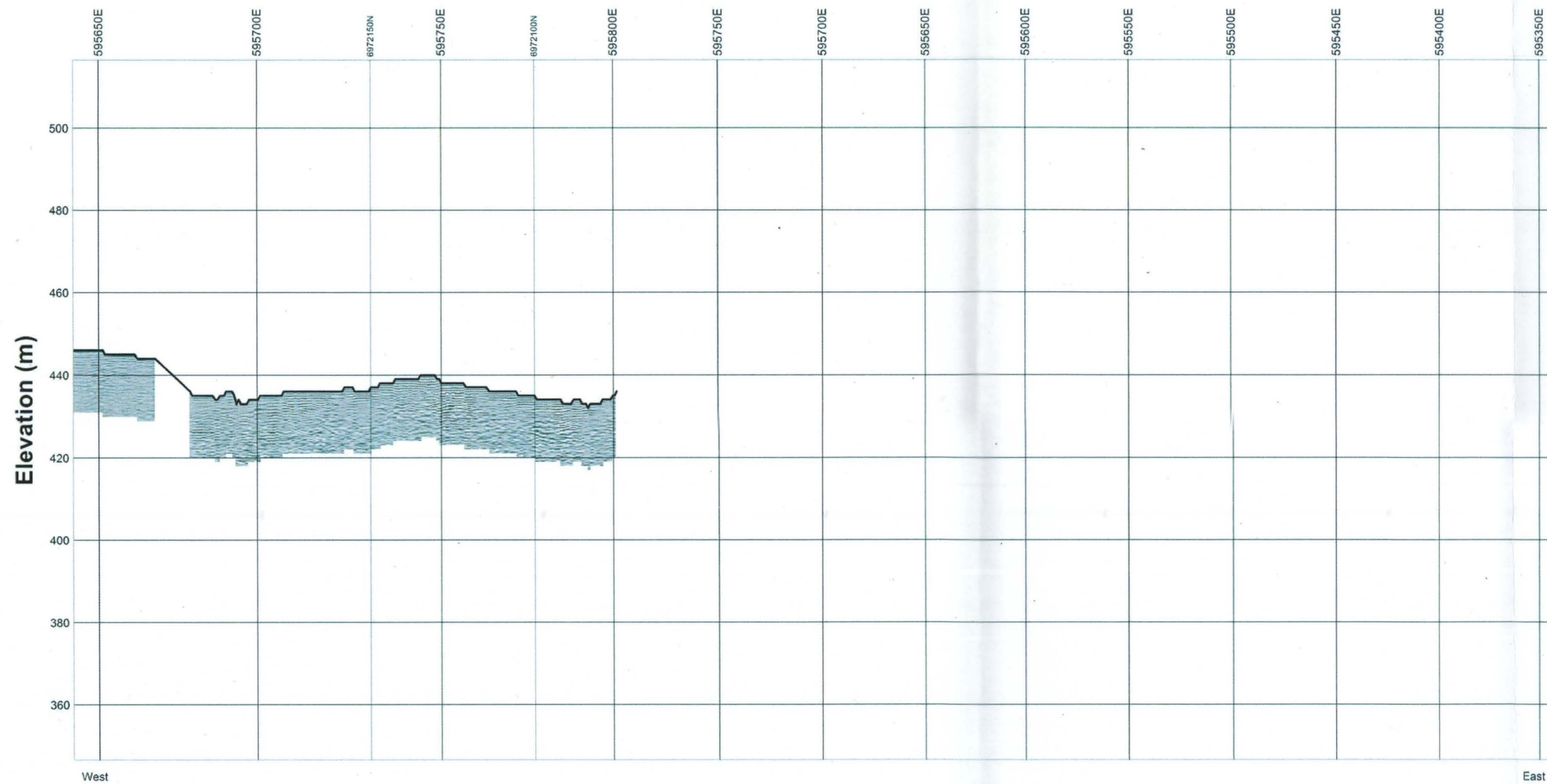


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Goldcorp Inc.  
Placer claim: IW00480  
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for  
Goldcorp Inc.

Placer claim: IW00480

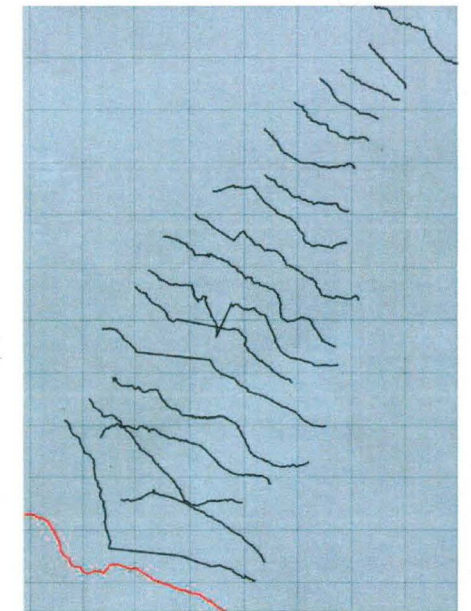
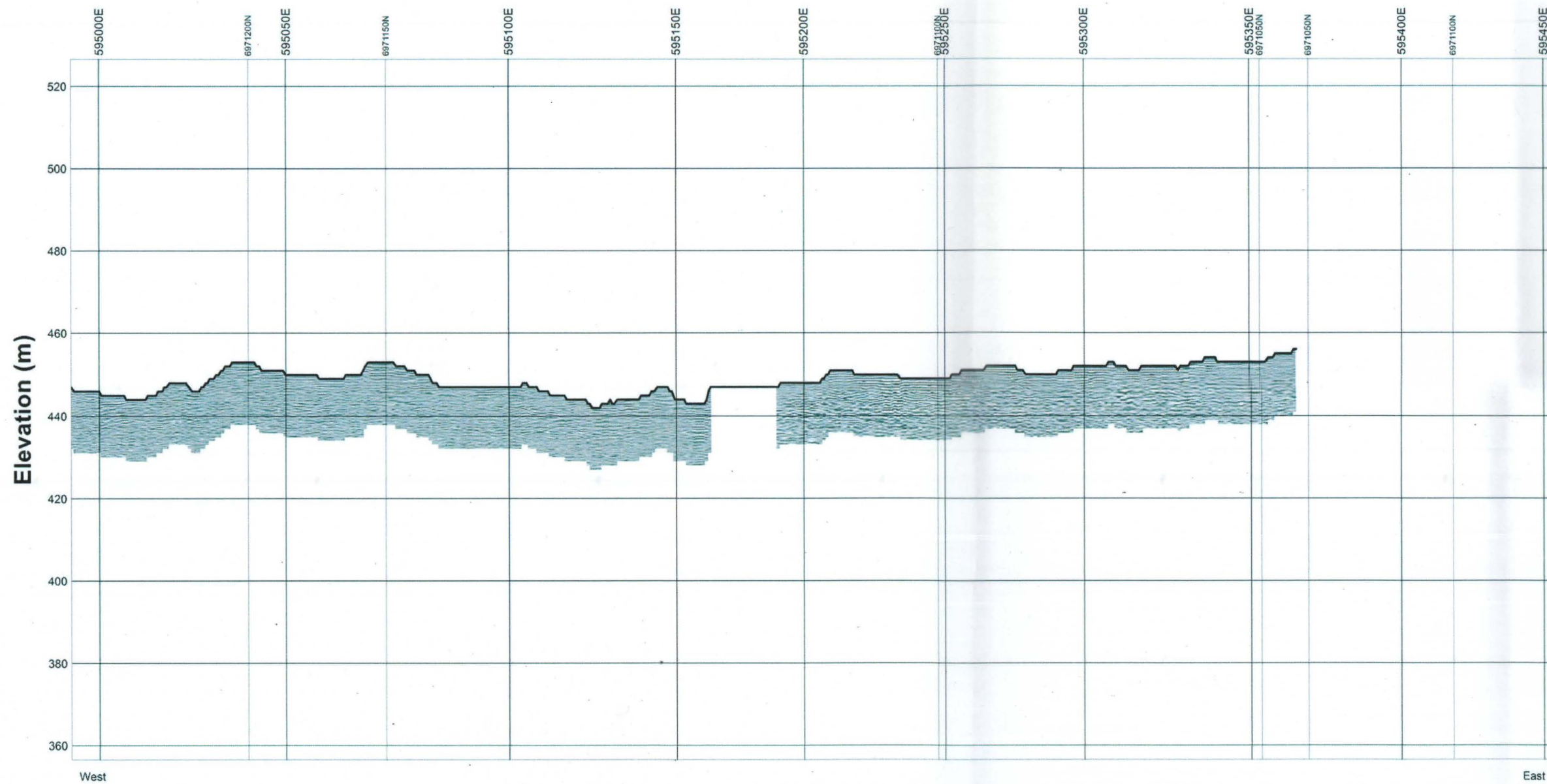
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Vertical Exaggeration: 2

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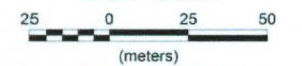


Aurora Geosciences Ltd.  
for  
Goldcorp Inc.

Placer claim: IW00480

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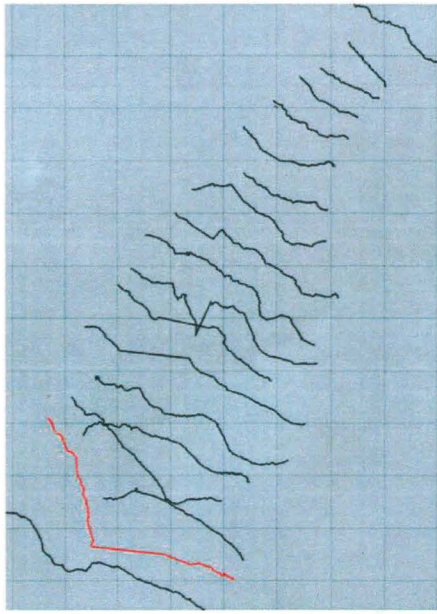
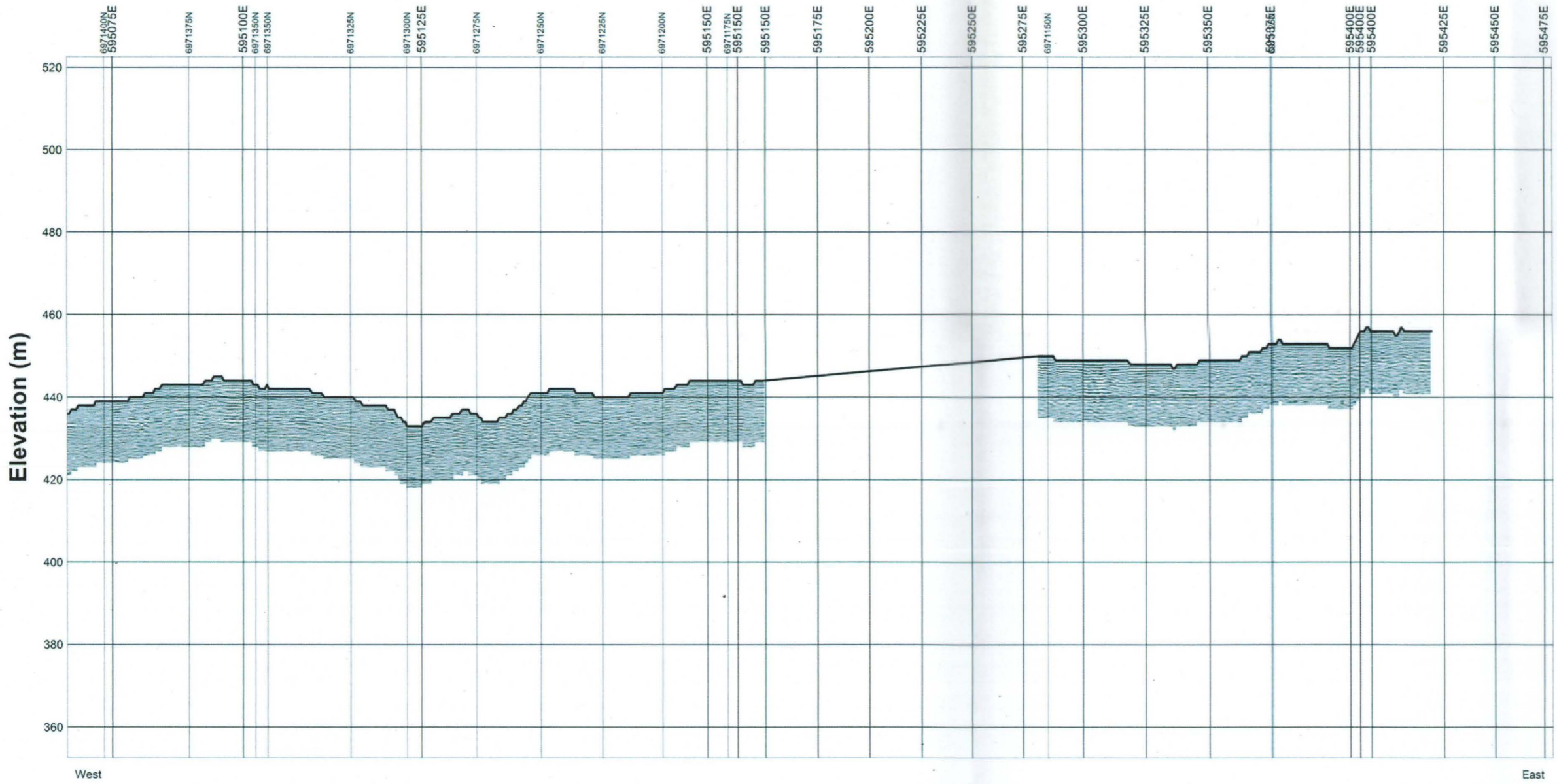
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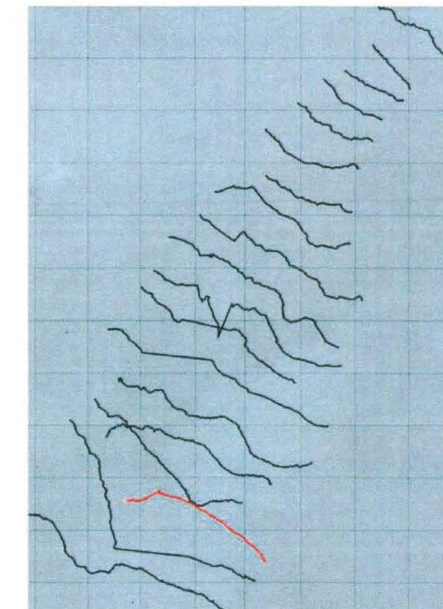
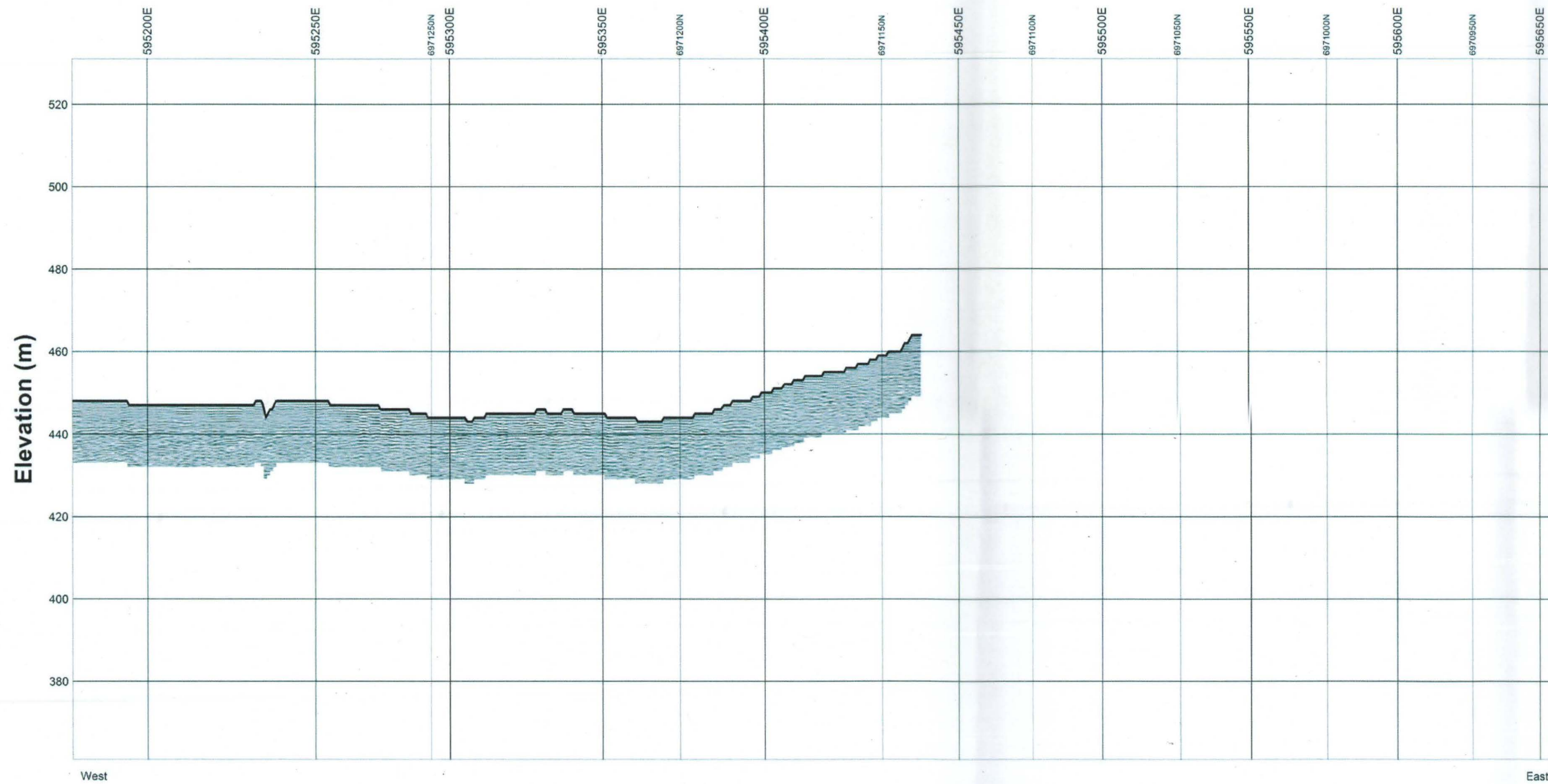
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Goldcorp Inc.  
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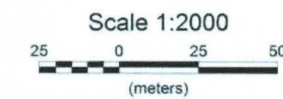
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for  
Goldcorp Inc.

Placer claim: IW00480

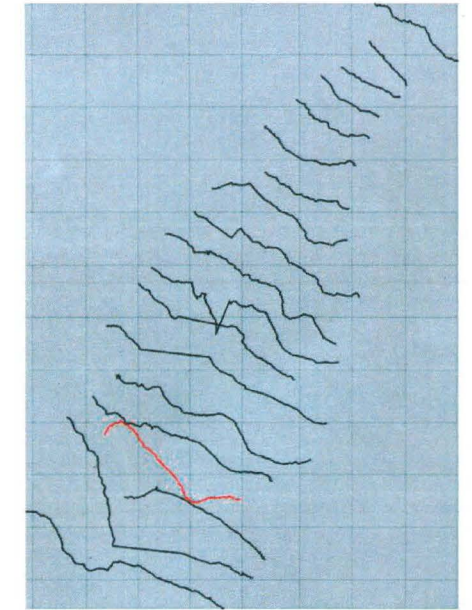
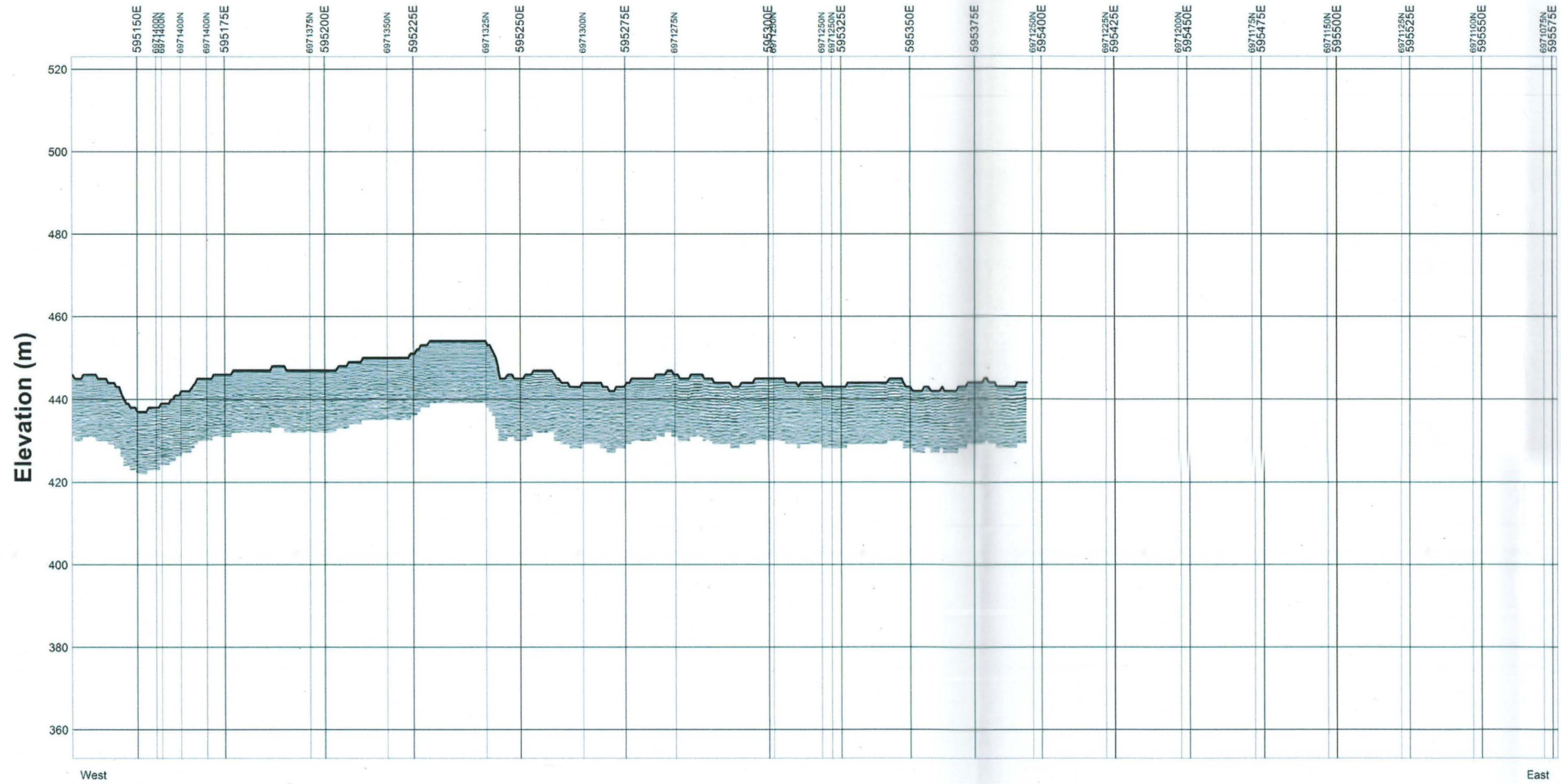
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Vertical Exaggeration: 2

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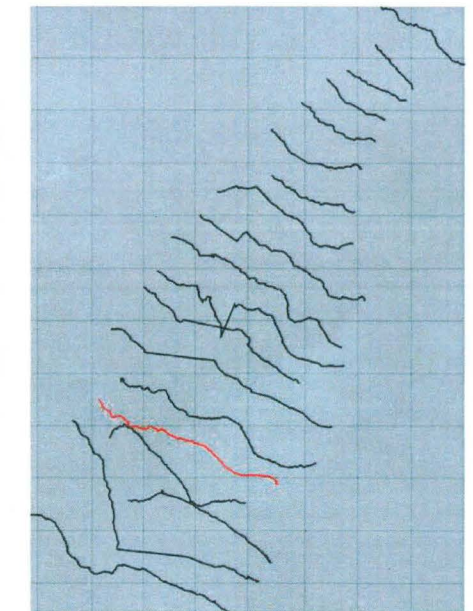
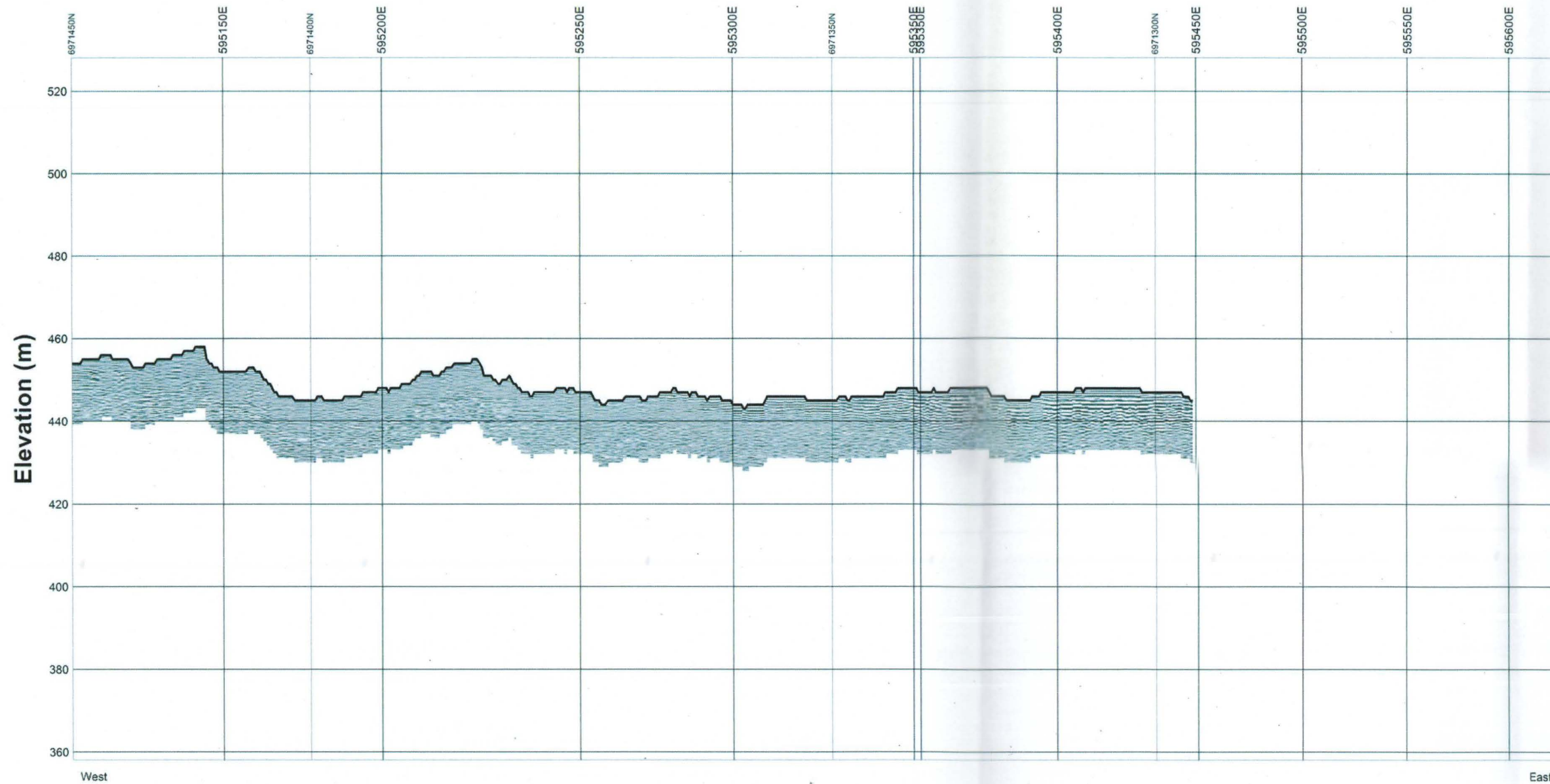


Aurora Geosciences Ltd.  
for  
Goldcorp Inc.  
Placer claim: IW00480  
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for  
Goldcorp Inc.

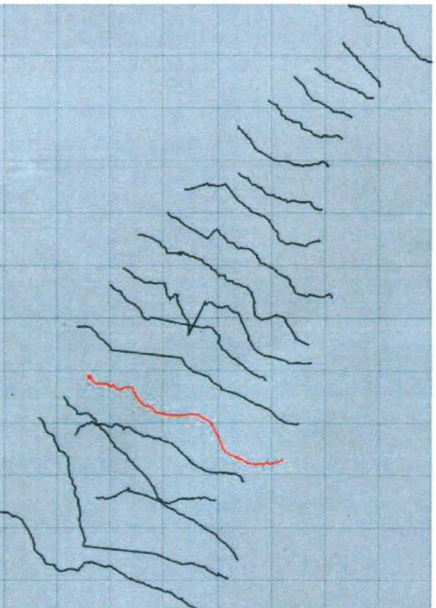
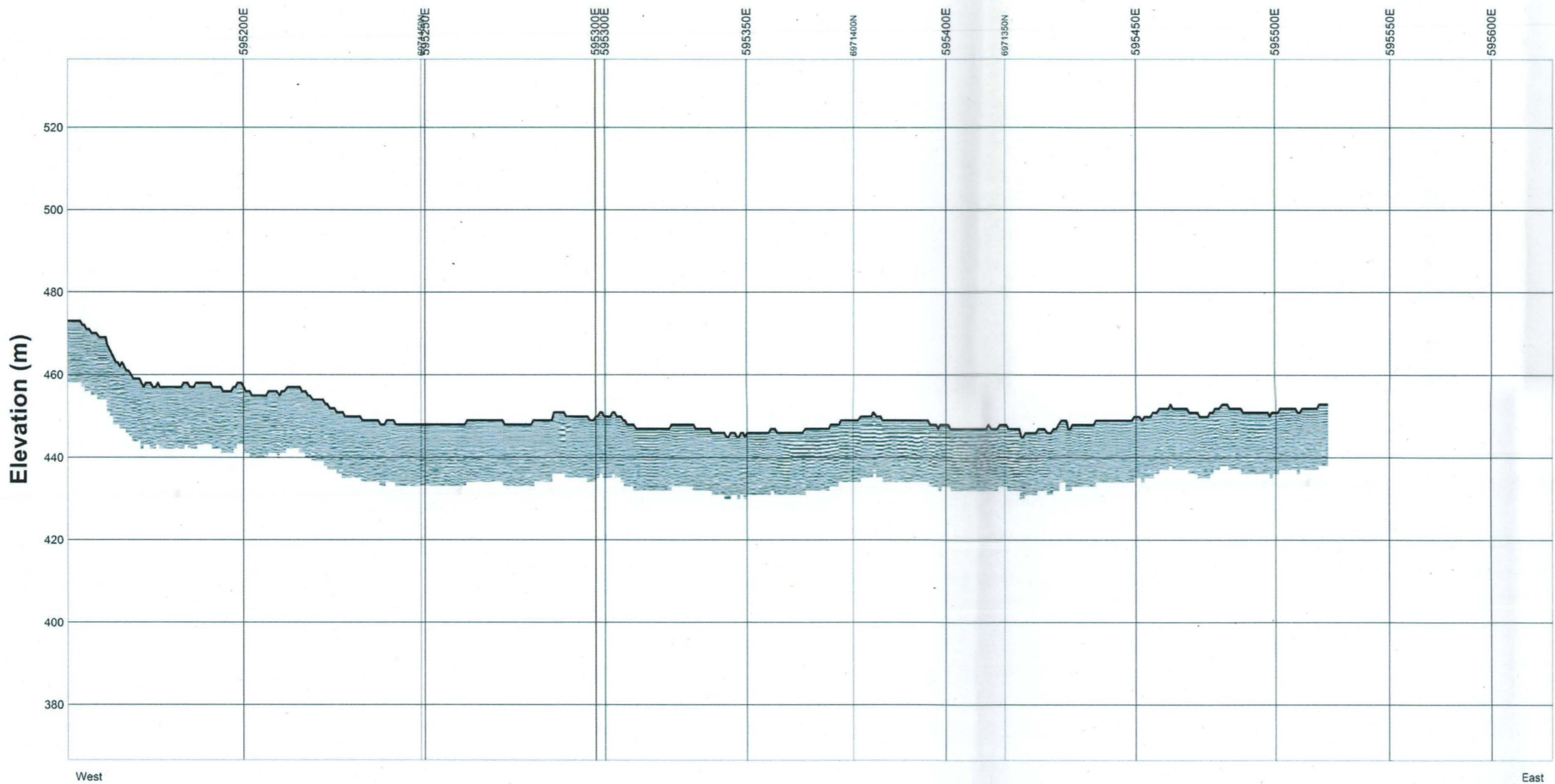
Placer claim: IW00480

Instrument: Mala ProX  
Antenna: 50 MHz Rugged Terrain Antenna  
Collected: 2017-09-25&26 by TU  
Processed: 2017-10-01 by TU

Scale 1:2000  
25 0 25 50  
(meters)  
WGS 84 / UTM zone 7N

Vertical Exaggeration: 2

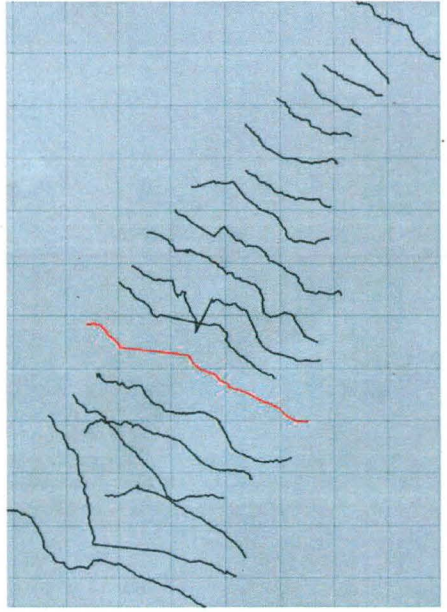
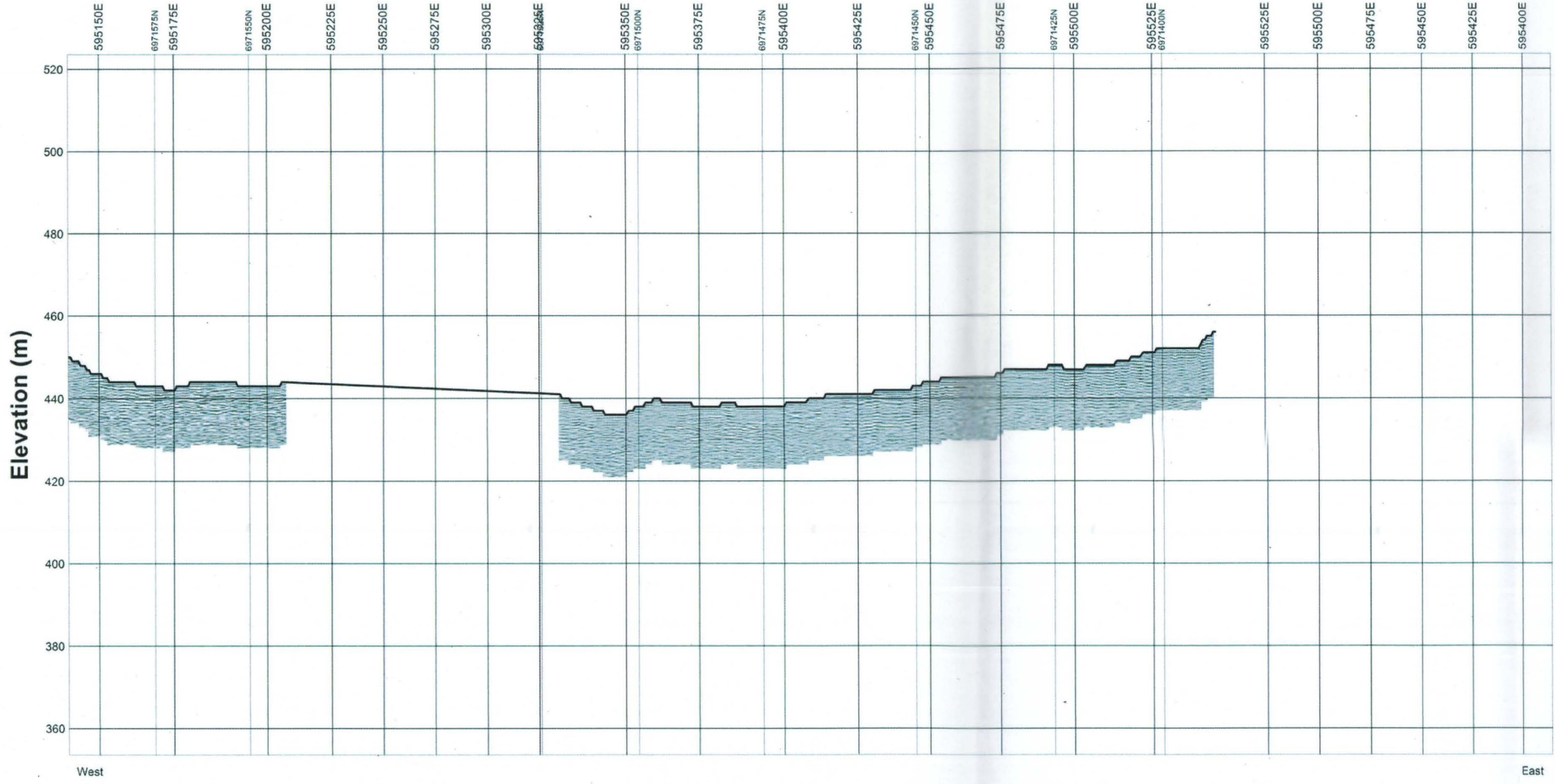
# Coffee Creek GPR: L320E



Aurora Geosciences Ltd.  
for  
Goldcorp Inc.  
Placer claim: IW00480  
Instrument: Mala ProX  
Antenna: 50 MHz Rugged Terrain Antenna  
Collected: 2017-09-25&26 by TU  
Processed: 2017-10-01 by TU

Scale 1:2000  
25 0 25 50  
(meters)  
WGS 84 / UTM zone 7N  
Vertical Exaggeration: 2

# Coffee Creek GPR: L400E

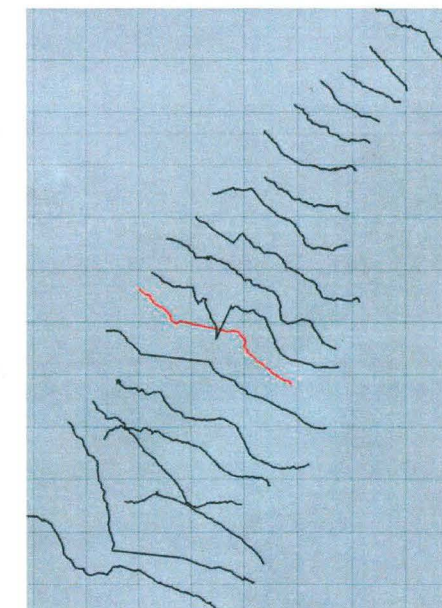
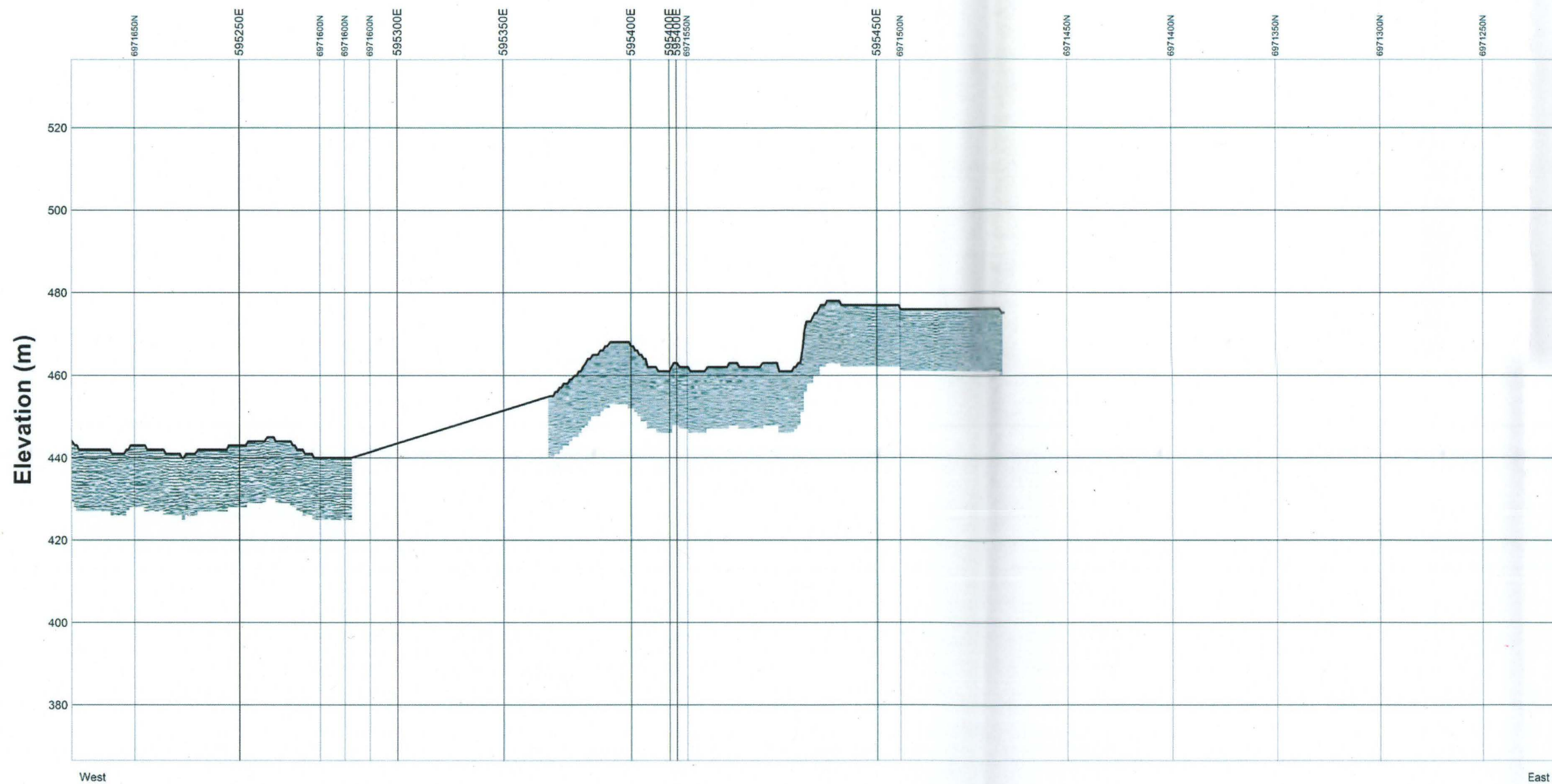


Aurora Geosciences Ltd.  
for  
Goldcorp Inc.  
Placer claim: IW00480  
Instrument: Mala ProX  
Antenna: 50 MHz Rugged Terrain Antenna  
Collected: 2017-09-25&26 by TU  
Processed: 2017-10-01 by TU



WGS 84 / UTM zone 7N  
Vertical Exaggeration: 2

# Coffee Creek GPR: L460E



Aurora Geosciences Ltd.  
for  
Goldcorp Inc.

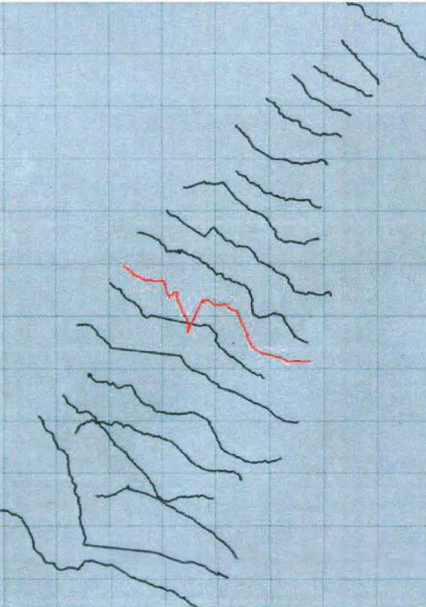
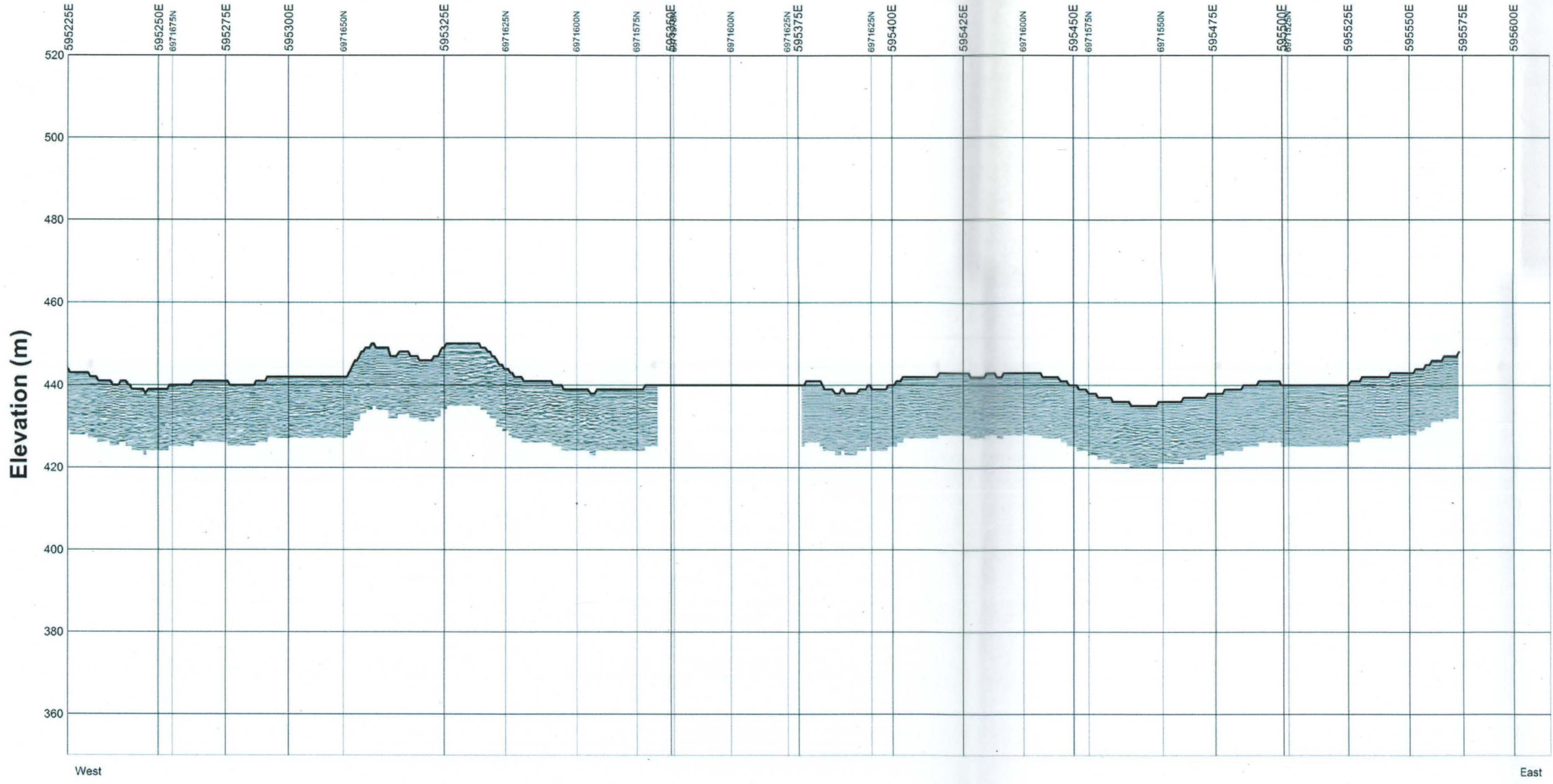
Placer claim: IW00480

Instrument: Mala ProX  
Antenna: 50 MHz Rugged Terrain Antenna  
Collected: 2017-09-25&26 by TU  
Processed: 2017-10-01 by TU



Vertical Exaggeration: 2

# Coffee Creek GPR: L520E

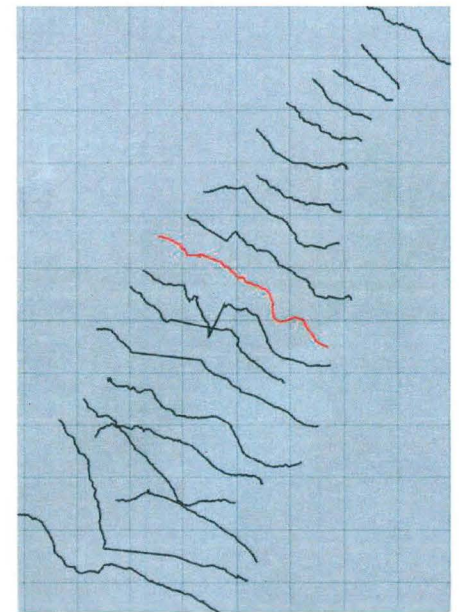
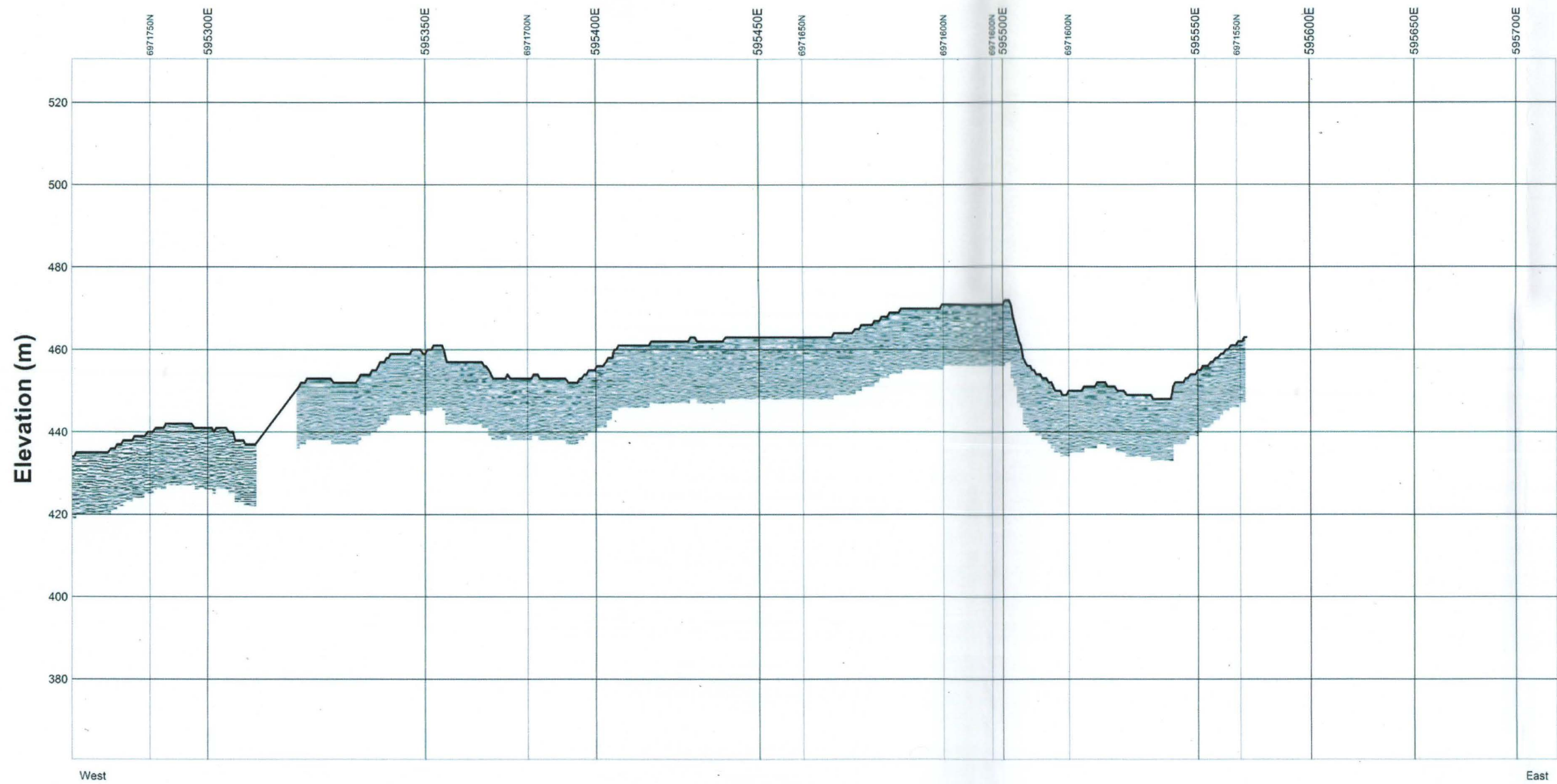


Aurora Geosciences Ltd.  
for  
Goldcorp Inc.  
Placer claim: IW00480  
Instrument: Mala ProX  
Antenna: 50 MHz Rugged Terrain Antenna  
Collected: 2017-09-25&26 by TU  
Processed: 2017-10-01 by TU



Vertical Exaggeration: 2

# Coffee Creek GPR: L580E



Aurora Geosciences Ltd.  
for  
Goldcorp Inc.

Placer claim: IW00480

Instrument: Mala ProX  
Antenna: 50 MHz Rugged Terrain Antenna  
Collected: 2017-09-25&26 by TU  
Processed: 2017-10-01 by TU

Scale 1:2000  
25 0 25 50  
(meters)  
WGS 84 / UTM zone 7N

Vertical Exaggeration: 2