841181 Dec 2, 1983
Barb Claims

Barb Claims

Mike,

Find enclosed hand written report, appendix 1 and maps for my work on the Barb property. I am sure that you as the resident Barb geologist are looking foreword to finishing it off. The following are notes on things that need to be ammended, completed or added.

Maps.

Fig 1. - I have made corrections to the geology map on the attached paper print. The legend looks the "pits". Redraft using finer printing and add other things I have noted in pencil.

a. location map - showing location of property in relation to Atlin, Juneau etc. scale 1:2,000,000 should be added to the top right hand corner of the map.

You also need a title block for this map and scale.

Fig 2. Rock locations - Title block and scale needed

Figure's 3-7. Title block and scale needed. Note that at each rock location the particular rock unit should be entered as well as geochemical value.

Figure 8. - Composite rock geochemical anomalies. You will see that I have a code for each metal anomaly. You can use any code symbol you like. Title needed.

Report - Take the liberty of changing anything that doesn't look correct.

I will be attending the Geoscience at the beginning of next week so won't be in office. I will phone about Tuesday to see if you have any questions.

P.S. Note my recommendation to do more prospecting in that lovely bush. You should enjoy it

Geological and Rock Geochemical Report
on the
Barb Claim Group

NTS 104K 10 & 15

King Salmon Lake Area

Latitude: 58° 45' N

Longitude: 132° 54' W

by

M.P. Phillips
Archer, Cathro & Associates (1981) Limited

for

Chevron Canada Resources Ltd.

December, 1983.

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ILLUSTRATIONS

APPENDIX

Geological Report - Barb Claims
King Salmon Lake Area

~~Introduction~~
~~General~~

Geological mapping was conducted on a 0.9 x 1.5 km. area on the Barb mineral claims by the writer during the period June 29 to July 11, 1983. ~~Access to the property daily was by a helicopter based at Chevron's Trapper Lake campsite~~

Purpose of this work was to obtain greater geological control on the low order 1982 gold geochemical anomalies located immediately west of the baseline between 22+00N and 24+00N.

Slope corrected cross lines from the baseline at 50 meter intervals were established using hip chain and compass. The lines were well flagged and blazed in treed areas. Tie lines were run near the ends of the cross lines. Difficulty was experienced in accurately locating the cross lines because of the thick bush, steep topography and magnetite content in some of the rock units.

A representative suite of rocks, generally those better mineralized, was sent to Chemex Labs, North Vancouver for geochemical analyses.

General Geology.

The regional geology is described by J.G. Souther of the Geological Survey of Canada in Memoir 362, Tulsequah map sheet.

The oldest rocks in the Barb claims area are the King Salmon Formation, calcareous siltstones and shales located near the base of the Upper Triassic Stuhini Group. The Sinwa Formation limestone is emplaced over the Stuhini Group by the east dipping King Salmon Thrust. Middle Jurassic and/or Cretaceous quartz-diorite stocks and Cretaceous to Tertiary Sloko Group quartz-porphry dykes cut the older units. Pleistocene till covers valleys and creeks at lower elevations. A few glacial erratics are found in the higher areas.

Grid Geology (Figure 1)

Upper Triassic

The King Salmon Formation rocks, near the base of the Stuhini Group are black to dark brown in outcrop, pale to medium green when fresh, calcareous siltstone and shale. Minor narrow tuff beds and dark carbonaceous limestones occur within this unit. Weak disseminated pyrite occurs throughout.

This unit is usually fractured and bleached at and near intrusive contacts. Often a pale green very fine grained calcsilicate skarn is commonly developed within the intrusive aureoles

The Upper Triassic Sinwa Formation is a cliff forming thick bedded white to light gray fine grained clean marble. Within it are narrow beds of dark blue gray carbonaceous limestone and narrow, less than 2 cm, white and gray chert beds.

Beds of interformational breccia less than 0.5 metres, composed of up to 5 cm. angular white and black chert clasts are rare.

At and near the intrusive contacts the Sinwa Formation may be unaffected or altered to a brown weathering dolomite containing dolomite veinlets. In some places a weak pale green skarn containing epidote diopside and calcite with minor disseminated and lesser veinlet pyrite is developed. The clean nature of the marble results in poor skarn development. Massive magnetite zones up to 25 metres wide are located in the limestone, at intrusive contacts. Within the magnetite zones fine black and rarely white acicular tremolite is common. Blebs up to 1 cm. of fine crystalline pyrite is most common in the magnetite zones near the intrusive contacts.

post middle Jurassic and/or Cretaceous.

The intrusives have been subdivided into two units - hornblende-biotite quartz diorite and quartz diorite porphyry. The relationship between the two units was not seen on the grid, but they appear to be coeval.

It is tempting to place the porphyry unit in the late Cretaceous to early Tertiary Sloko Group, because of its porphyritic nature. Godfrey Walton of Chevron who visited the property with the writer and examined the quartz diorite porphyry in outcrop does not believe the unit is Sloko equivalent.

The writer interprets the equigranular quartz diorite as a high level stock with an irregular porphyritic shell and irregular dykes.

The mapping by Souther shows that this unit at higher elevations forms small acid to intermediate stocks. Where erosion has exposed a deeper section of the intrusive at lower elevations the stocks are larger and intermediate to basic in composition.

The possibility exists that the quartz diorite unit is the highlevel hypabyssal equivalent of the Triassic Stuhini Group volcanics.

The Unit 4 quartz diorite, located on the south-east edge of the grid, is a light to medium gray colored equigranular medium grained rock. Its mafic content varies from 10-20% with the hornblende content greater than the biotite content. Most of the mafic minerals have been altered to chlorite. ~~In general~~ Pyrite content is generally low.

The Unit 3 quartz diorite porphyry appears to form a shell around the Unit 4 quartz diorite as well as occuring as narrow, generally less than 10 metre dykes and in one case a 100 metre wide dyke. The contact between the two units was not seen. The medium green Unit 3 porphyry contains up to 40% medium grained, euhedral to subhedral, feldspar phenocrysts and 10-15% subhedral to anhedral hornblende and biotite phenocrysts. Quartz phenocrysts are not common.

The matrix is microcrystalline to very fine grained, and its dark color imparts the greenish color to the ~~unit~~ rock. Disseminated pyrite, replacing the mafics, is low. Fine disseminated magnetite, ~~is rare~~ rarely occurs in the dykes, but can occur in amounts up to 4% near the ~~outter~~ outer contact of the porphyry shell.

Within the Unit 3 quartz diorite porphyry are two subunits - 3a quartz-feldspar and 3b quartz feldspar biotite. The two subunits occur as narrow dykes and narrow zones within the quartz diorite porphyry. The quartz-feldspar porphyry is a light colored rock with crowded, fine to medium grained euhedral feldspar phenocrysts in a matrix ranging from aphanitic to very fine grained. Normally quartz phenocrysts up to 5% are subordinate to feldspar phenocrysts. At its contacts with the countryrock and sometimes within the unit the rock ~~is~~ chilled, sheared and brecciated. Hydrothermal alteration accompanied by copper lead and magnetite mineralization is associated with this subunit. The quartz-feldspar-biotite subunit is not common or well developed. Where seen, euhedral thin book biotite and fine biotite partially replacing hornblende is present. This biotite may result from hydrothermal potassic alteration

Structure

The King Salmon Formation beds, believed to be upright, strike north-south and dip steeply to the east. The Sinwa Formation limestone, seperated from the underlying King Salmon formation by the northwest trending, easterly dipping King Salmon thrust Fault, trend east and dip moderate to steeply to the north. The quartz diorite porphyry dykes trend northeast to easterly and contacts appear to be near vertical. Topographic lineaments, probably representing faults have an orientation ranging from north to easterly.

Alteration

Alteration zoning associated with porphyry and lode gold occurrences usually shows increasing alteration grades towards mineralization.

The fresh rock grades into propylitic, then through argillic and finally to the alunite-quartz or silica gold bearing facies. Occasionally where copper and molybdenum-mineralization is present phyllic or sericite alteration grades to the potassic facies at the center of the alteration system. Not all facies are always well developed or present.

On the Barb claims the quartz diorite porphyry, Unit 3, is the only rock that exhibits hydrothermal alteration alteration. Alteration ranges from weak to strong propylitic with minor weak quartz-alunite alteration possibily present at the copper breccia zone.

Weak propylitic alteration is developed where the hornblende is altered to chlorite, montmorillonite calcite and pyrite. The plagioclase remains fresh or only weakly altered. This type of alteration imparts a medium to dark green color to the rock. With increasing propylitic alteration, the plagioclase alters to a soft pale green clay (montmorillonite) calcite and increasing amounts of pyrite. This alteration, present mainly in Unit 3a quartz feldspar porphyry imparts a pale bleached appearance to the rock.

Pervasive and veinlet silicification is associated with strong propylitic alteration and late stage carbonate (ankerite) veining at the copper breccia zone on the west side of the grid and may be indicative of incipient quartz-alunite alteration

Mineralization

Copper mineralization is present in a circular, 140 metre wide breccia located on the west side of the grid. This showing has in the past been explored with hand trenching and diamond drilling. The breccia occurs in King Salmon Formation thick bedded siltstone and shale where it is cut by a quartz feldspar porphyry dykes estimated to be about 30 metres wide. The quartz-feldspar porphyry exhibits strong propylitic alteration and, in a few places strong pervasive silicification. Traces of tourmaline may be present. In the vicinity of the hand trench veinlet silicification occurs with coarse crystalline quartz lining breccia cavities. These have later been filled with a brown weathering carbonate believed to be ankerite. Copper mineralization as coarse crystals of chalcopyrite and fracture coating malacite, is associated with the strong pervasive and veinlet silicification. The porphyry dyke does not appear to be brecciated; however the bleached and gossany siltstone-shale country rock exhibits strong crackle brecciation. None of the fragments appear to be rotated or rounded. Quartz and carbonate occur as veinlets and coatings along open crackle fractures. Minor specularite, now weathered to earthy hematite, is occasionally present in the carbonate veinlets. A late stage, white mineral believed to be a zeolite sometimes coats the open carbonate lined fractures.

Both east and west along strike, outside the breccia, the quartz-feldspar dykes grades into a fresh to weakly altered diorite porphyry.

Fracture filling galena mineralization is located on crossline 23+50N at 3+50W. It occurs in a brecciated, less than 0.5 metre wide, northeast trending, weakly pyritic quartz feldspar porphyry dyke which exhibits strong propylitic alteration. A selected hand speciman, with about 20% galena, assayed 115 ppb gold, 67 ppm silver, (greater than 1000 ppm silver, 230 ppm antimony and 265 ppm copper. fill in data, I don't have results)

Massive pyrrhotite and pyrite float, in lenses up to one metre wide, was found below a strong north easterly structure located on crossline 22+00N at 5+50W. These lenses appear to have been been blasted from the structure by previous workers. The structure cuts the King Salmon Formation beds a short distance south west of the strong propylitic altered 100 metre wide quartz feldspar porphyry dyke. Abouts 25 metres south of this structure is a parallel trending, less than 0.5 metre wide, pyritic, strong propylitic brecciated quartz feldspar dyke. Along strike 50 metres to the southwest, a five metre diameter zone contains veinlet magnetite in a crackle brecciated and carbonate veining bleached siltstone.

Magnetite occurs as fine disseminations and massive pods. Fine disseminated magnetite (up to 5%) is present in the quartz diorite porphyry; most commonly occuring at the contacts of the quartz diorite porphyry intrusive shell. Disseminated magnetite is rare in the quartz diorite porphyry dykes. However where the dykes cut the Sinwa Formation limestone, massive magnetite in irregular pods and lenses up to 25 meters wide occurs in the contact zones.

There the magnetite varies from strongly disseminated in a brown marble matrix to massive with abundant fine, black or rarely white, acicular tremolite. The magnetite pods and lenses are occasionally pyritized although in most cases the pyrite content is less than 2%. In the magnetite pods and lenses near the porphyry dykes there is an increase in fine crystalline pyrite where it is present in 1 cm. blebs. The porphyry dykes near the magnetite occurrences exhibit weak to strong propylitic alteration. In general the largest pods and lenses of magnetite are associated with the strongest propylitic alteration and more intense pyritization

A crude porphyry-like mineral zoning is present on the grid. Chalcopyrite occurs in the breccia zone within the highest alteration facies. About

600 metres northeast of the copper breccia is fracture filling galena in a narrow, strongly propylitic altered quartz feldspar porphyry dyke. Northeast of the galena showing and immediately west of the baseline is the 1982 > 10,000 ppb gold geochemical soil anomaly.

Rock Geochemistry
(Figures 2-8)

¶ Twenty seven hand specimens collected by the writer were sent to Chemex Labs, North Vancouver for gold, silver, arsenic antimony and copper geochemical analyses

¶ [Mike - write up sample crushing, screening and analytical procedures. Preparation code is 205]

More than half of the specimens are from the fresh to strongly altered quartz diorite porphyry (Unit 3), the unit responsible for alteration and mineralization on the property. Most of the specimens are mineralized

The writer has used past experience to determine which results should be considered anomalous, since the suite of rocks is not large and is biased towards those that are strongly altered as well as mineralized

The geochemical results for each sample, as well as details on rock type, alteration and mineralization are tabulated in Appendix 1 and discussed below:

Gold

Geochemical background for gold is often taken as 5 ppb and interesting anomalous levels are those where values exceed 100 ppb.

One sample of fresh, unmineralized quartz diorite assayed 20 ppb, which may represent background gold levels in the intrusive.

Fifteen samples of quartz diorite porphyry returned assays ranging from a low of less than 5 to a high of 70 ppb. Two of these MP3T1-1 & 07 representing typical fresh and unmineralized rock, had assays of 20 and less than 5 ppb gold respectively. If greater than 20 ppb is taken as background, seven samples exceeded this, but none exceeded 100 ppb.

Some of the samples that showed brecciation and intense propylitic alteration tended to show slightly higher gold values, but in general there was no correlation between gold values and alteration. Similarily there was little correlation between pyrite mineralization and gold values. The highest gold value (70ppb, in MP3T1-28) has a strong correlation with an arsenic assay of 1,000 ppm.

One sample, from King Salmon Formation (Unit 1), ran 80 ppb, ie moderately anomalous. The rock is a strongly fractured and crackle brecciated siltstone-shale with strong pervasive limonite. It occurs next to a fresh porphyry dyke

Two samples of pyritic skarn from the King Salmon Formation (Unit 1a and 1b) had gold values below background.

Two out of three samples (MP3T1-24 and 26) of skarn (Unit 2c) are strongly anomalous - 330 and 415 ppb gold respectively. The rock is a epidote diopside tremolite skarn with up to 5% disseminated and fine fracture filling pyrite

All three samples of massive magnetite (Unit 2d), with values of 120 to 160 ppb, had gold values well within the interesting range. Each sample shows up to 5% blebby and finely disseminated pyrite.

The sample of galena ran 115 ppb., just within the strongly anomalous level. The sample of massive pyrrhotite-pyrite float assayed 50 ppb which is lower than expected for a rock with this type of mineralization

Silver

For this report values below 1 ppm silver are considered background, those between 1 and 2 ppm anomalous and values above 2 ppm strongly anomalous.

Values in the quartz diorite (Unit 4) and quartz diorite porphyry (Unit 3) are all below background, ranging between 0.1 and 0.9 ppm silver. Three of these which approach background value occur immediately south west of a cluster of three gold anomalies in magnetite.

Three samples from the King Salmon Formation (Unit 1) were below background values.

One sample out of three from Sinwa Formation, pyritic epidote diopside tremolite skarn (Unit 2c) was strongly anomalous - 8.1 ppm silver.

All three samples of magnetite (Unit 2d), containing fine disseminated to blebby pyrite, were moderate to strongly anomalous.

Both samples of galena and massive pyrite-pyrrhotite returned strongly anomalous values, but the galena sample did not have as high a value as one would expect.

Arsenic

Background arsenic values are those below 12 ppm, weak-moderate anomalous values those to 100 ppm, and those above 100 ppm strongly anomalous. Background was determined from the value of 12 ppm for a typical unaltered or mineralized quartz diorite porphyry (MP3T1-10)

The only sample of quartz diorite (Unit 4) assayed 5 ppm, well below background levels.

All values in the quartz diorite porphyry (Unit 3) were above background level, with four of these strongly anomalous in arsenic. All four strongly anomalous values were in narrow, (less than 2 metres wide) quartz diorite porphyry dykes exhibiting brecciation and intense propylitic alteration. Samples with pyrite mineralization were only weak to moderately anomalous.

Three of the samples from King Salmon Formation (Unit 1) were weak to moderately anomalous.

Only one of the three samples of Sinwa Formation skarn (Unit 2c) was strongly anomalous - 620 ppm.

One sample of magnetite (Unit 2d) with 3-5% disseminated pyrite assayed 310 ppm and the other two samples were moderately anomalous in arsenic.

As expected the samples of galena and massive pyrite-pyrrhotite were anomalous in arsenic.

Antimony

Anomalous values are those above 10ppm antimony.

Only two of the quartz diorite porphyry samples were anomalous. Both were in narrow, (less than 2metre wide) porphyry dykes having brecciation and intense propylitic alteration.

One of the three samples of magnetite (Unit 2d) with blebby pyrite was weakly anomalous and another one was just below background.

The sample of massive galena was strongly anomalous, however the massive pyrite-pyrrhotite sample was below background level.

Copper.

Samples with values above 100ppm copper are considered to be anomalous.

The only sample of quartz diorite (Unit 4) assayed 20 ppm, well below background.

Just over half of the samples of quartz diorite porphyry (Unit 3) were weakly to strongly anomalous. In general, those with strong propylitic alteration and containing pyrite, had the highest values. The high number of anomalous samples in this unit is expected since the porphyry in the breccia zone on the southwest side of the grid contain copper mineralization. Five strongly anomalous samples are located in the 100 metre wide porphyry dyke (Unit 3a) within a 200 metre zone immediately southwest of its contact with the Sinwa Formation Limestone

Both skarn samples from the King Salmon Formation (Unit 1a and 1b), containing up to 5% fine disseminated pyrite, were weak to moderately anomalous -106 and 250 ppm.

One of the three samples of Sinwa Formation skarn (Unit 2c) was strongly anomalous -3000 ppm copper

All three samples of Sinwa Formation magnetite (Unit 2d), containing up to 5% blebby and fine disseminated pyrite, were strongly anomalous - 385, 445 and 730 ppm copper. These samples are in the same area where strongly anomalous copper values are present in the nearby 100 metre wide porphyry dyke.

As expected, both the galena and massive pyrrhotite-pyrite samples were strongly anomalous in copper.

Discussion

Figure 8 is a composite plot of the anomalous gold, silver, arsenic, antimony and copper values

The gold anomalies, generally co-incident with supporting anomalous silver, arsenic copper and with c one antimony values, occur in Sinwa Formation skarn and magnetite (Unit 2c and 2d). The gold anomalies form a crude half circle around the single sample exceeding 10,000 ppm taken in the 1982 survey.

A cluster of samples, anomalous only in copper, occurs immediately southwest of the gold anomalies and gives further support to the mineral zoning suggested earlier in this report.

Sample MP3T1-24, taken northeast of the baseline, is anomalous in all metals except antimony. This may indicate a possible trend to better values in a northeasterly direction.

Two other samples (MP3T1-22 and 28) are of interest. Both occur in narrow, (less than 2 metre wide) brecciated and intensely altered quartz diorite (Unit 3a) dykes. Both have co-incident moderately anomalous gold and anomalous antimony values. The northwest sample is anomalous in copper.

Conclusions

Geological mapping around the 1982 gold soil geochemical anomaly has shown that chalcopyrite, galena, and magnetite mineralization and weak gold soil geochemical anomaly is related to a Jurassic and/or Cretaceous propylitic altered quartz diorite porphyry which occurs as an intrusive shell and as narrow north to easterly trending dykes.

Recommendations

Ore deposit models proposed by Explorationists in the past few year have recognized that intrusives, particularly those Mid-Jurassic in age, cutting Triassic volcanics are favorable gold exploration targets. The intrusives acting as heat pumps are believed to strip the anomalous amounts of gold from the volcanics and redeposit it in

Further exploration by Chevron should be directed in other areas on the Barb claims and surrounding areas in the Tulsequah map sheet where intrusive cut Triassic Stuhini Group volcanics.

Respectively submitted

M.P. Phillips

Appendix 1

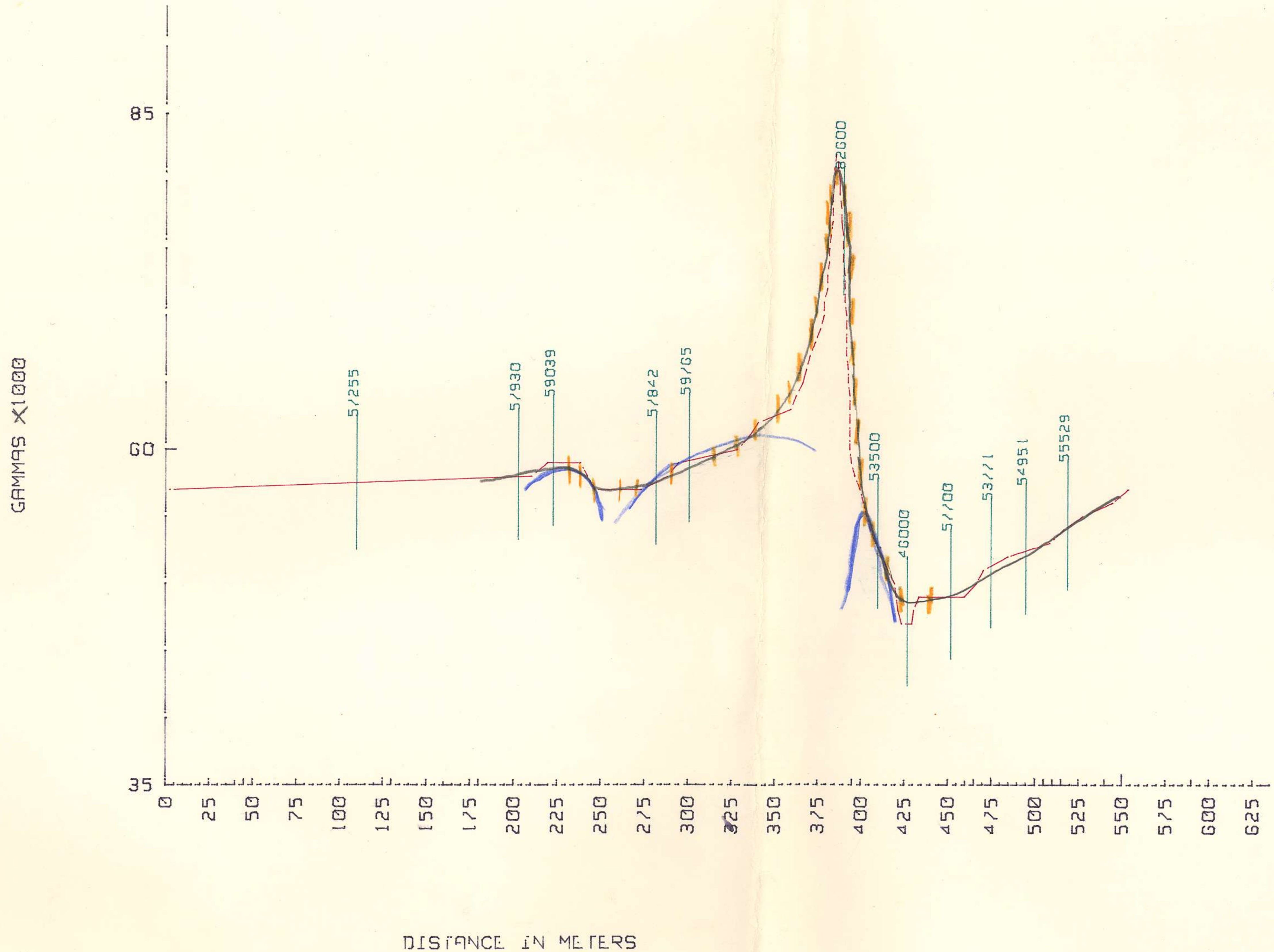
Table Showing Rock Geochemical Assays

Barb Claims

* see legend on Figure 1 for description of rock units

Sample No.	PPB Gold	PPM Silver	PPM Arsenic	PPM Antimony	Copper	*Rock Unit	Details
MP3T1-01	80	0.4	41	3.4	20	1 near 3 siltstone/shale	Strong fractured and crackle brecciated, sample highly pitted, strong limonite
-02	20	0.1	5	0.4	20	4	Typical quartz diorite
-03	Not available					3	Typical quartz diorite porphyry
04	20	0.3	46	2.9	275	3a	Strong pervasive propylitic alteration with quartz veining
05 [22]	45	0.1	25	5.6	37	3a	Strong pervasive propylitic alteration, 1-3% disseminated pyrite
06	115	67.0	71000	230.0	265	Galena	In strong propylitic altered porphyry
07	20	0.9	46	5.4	63	3a	Fresh
08	160	2.7	51	21.0	445	2d	Up to 1 cm. blebs of medium to coarse grained crystalline pyrite
09	5	0.4	73	3.2	106	1a	Typical with 1-2% fine crystalline pyrite
10 [4]	<5	0.2	12	1.3	24	3	Typical
11 [7]	15	0.1	23	1.5	250	1b	Up to 5% fine disseminated brassy and white colored pyrite - white pyrite possibly arsenopyrite
12 [39]	10	0.9	43	2.4	515	3a	Strong propylitic alteration with 1-3% fine disseminated brassy and white pyrite, white pyrite possibly arsenopyrite
13 [3]	5	0.3	16	1.4	380	3a	'Cherty' appearance, 5% white fracture filling pyrite, strong limonite. White pyrite-arsenopyrite?
14 [46]	50	0.7	24	0.8	435	3a	Beside unit 2d, fresh? 3-5% disseminated fine pyrite and possible pyrrhotite, strong limonite on fractures
15	120	2.6	310	1.2	730	2d	Magnetite with 3-5% disseminated fine pyrite, possible pyrrhotite
16	15	0.6	19	0.8	620	3a(?)	Altered with fracture pyrite, possible arsenopyrite
17	30	0.2	750	3.8	29	3a	Intense propylitic alteration
18	50	4.7	35	3.6	3950	Massive pyrite and pyrrhotite float	
19 [59]	40	0.1	25	1.0	255	3a	Intense altered propylitic, to 5% fine disseminated yellow and white (pyrite, white pyrite(?) possibly arsenopyrite
20 [61]	<5	0.1	20	1.2	92	3a	Strong propylitic altered
21 [69]	10	0.1	14	0.6	143	3a	Altered(?) with 1-3% fine disseminated pyrite
22 (86)	40	0.1	71,000	10.0	32	3a	Brecciated with intense propylitic altered
23 (97)	25	0.1	320	5.2	390	3a	Intense propylitic altered with <½% disseminated magnetite
24 [132]	330	8.1	620	1.0	3000	2c	3% fine disseminated to blebby pyrite
25 [164]	150	7.5	39	8.0	385	2d	Magnetite with 5% <1cm. blebby yellow and white pyrite, white pyrite - arsenopyrite(?)
26 [165]	415	0.6	63	1.4	90	2c	Up to 5% fracture filling pyrite, trace chalcopyrite, strong insitu boxwork limonite on fractures
27 [169]	55	0.1	43	1.4	25	2c	Beside 3a dyke, 5% fine disseminated pyrite
28 [171]	70	0.8	1000	21.0	110	3a	Brecciated with intense propylitic altered

BARB A - A'



HORIZONTAL SCALE

1 TO 2500

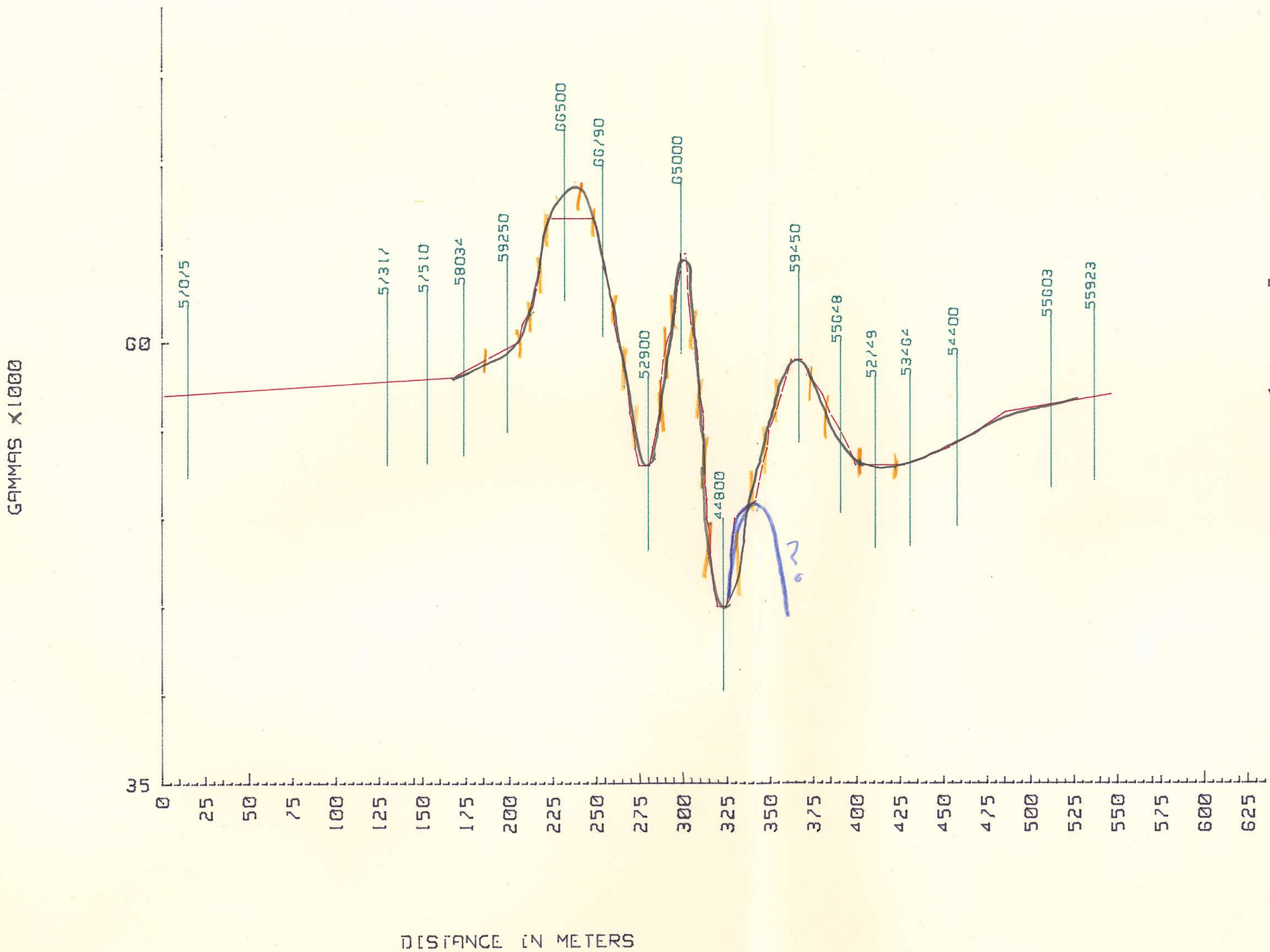
VERTICAL SCALE

1 TO 3.25842

Y EXAGGERATION

1 : .130337

BABB B-B'



HORIZONTAL SCALE

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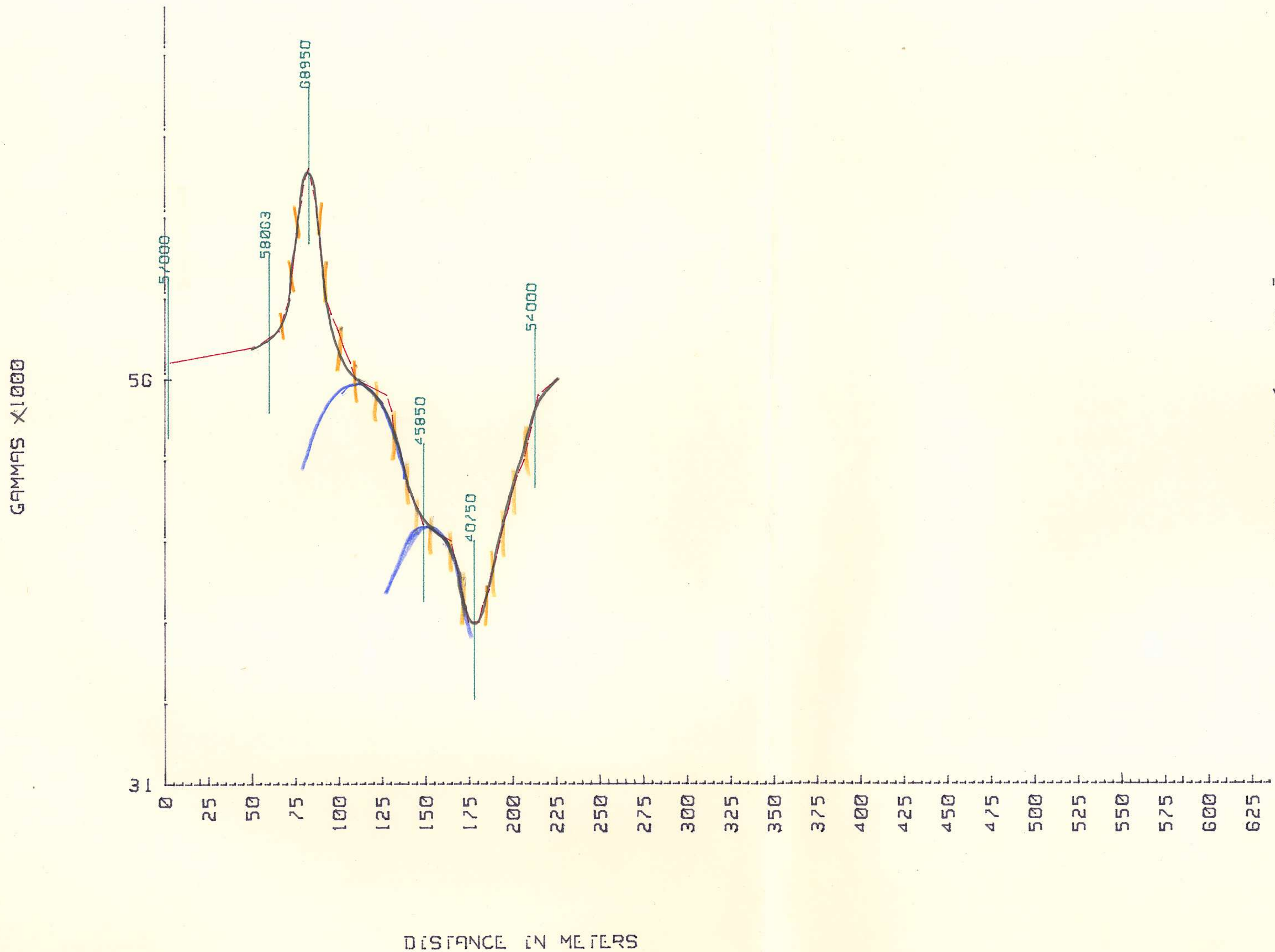
VERTICAL SCALE

1 TO 2.47191

Y EXAGGERATION

1 : 9.88764

BARB C-C′



HORIZONTAL SCALE

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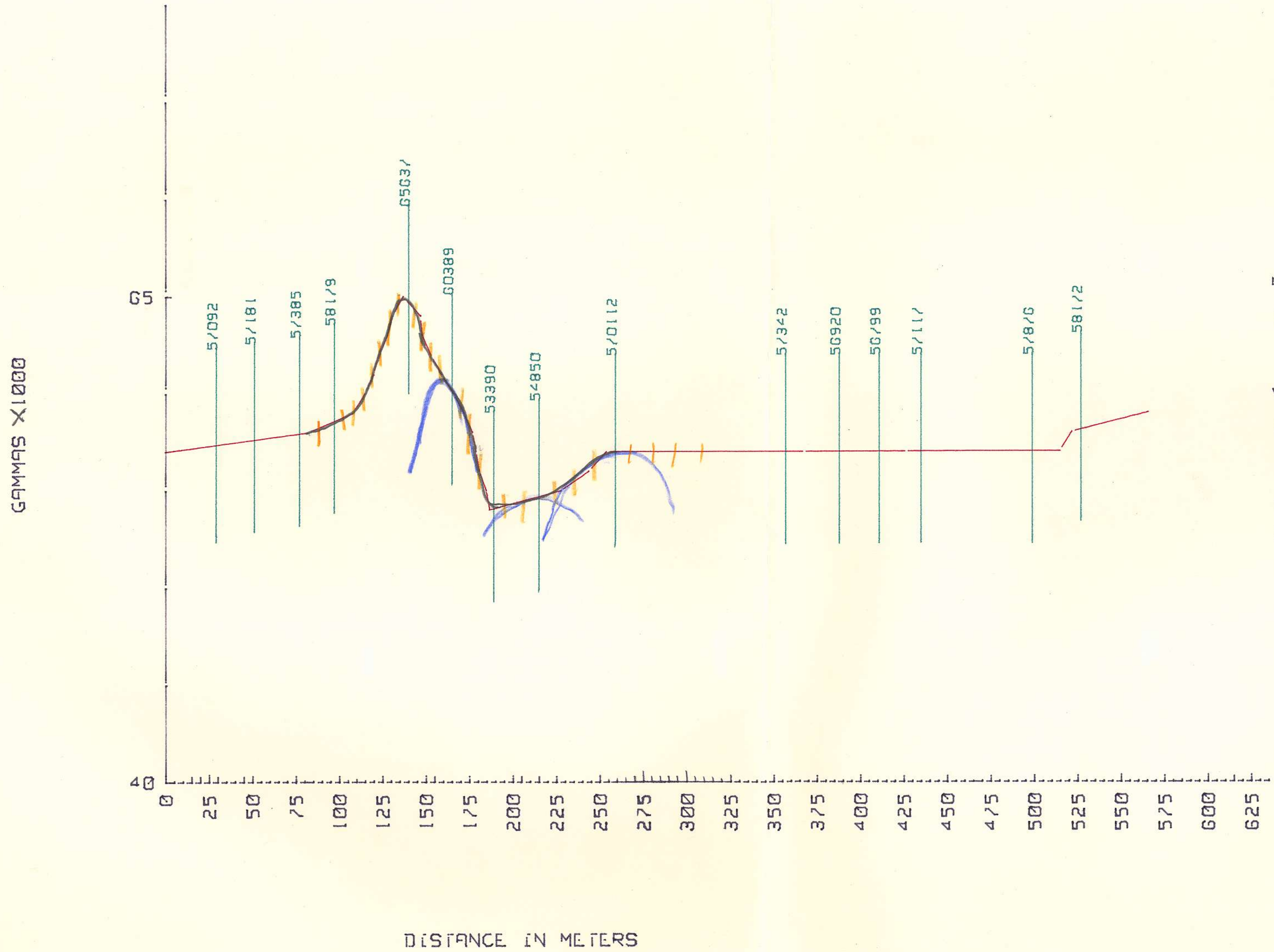
VERTICAL SCALE

1 TO 2.69662

Y EXAGGERATION

1 : .107865

BARB D-D



HORIZONTAL SCALE

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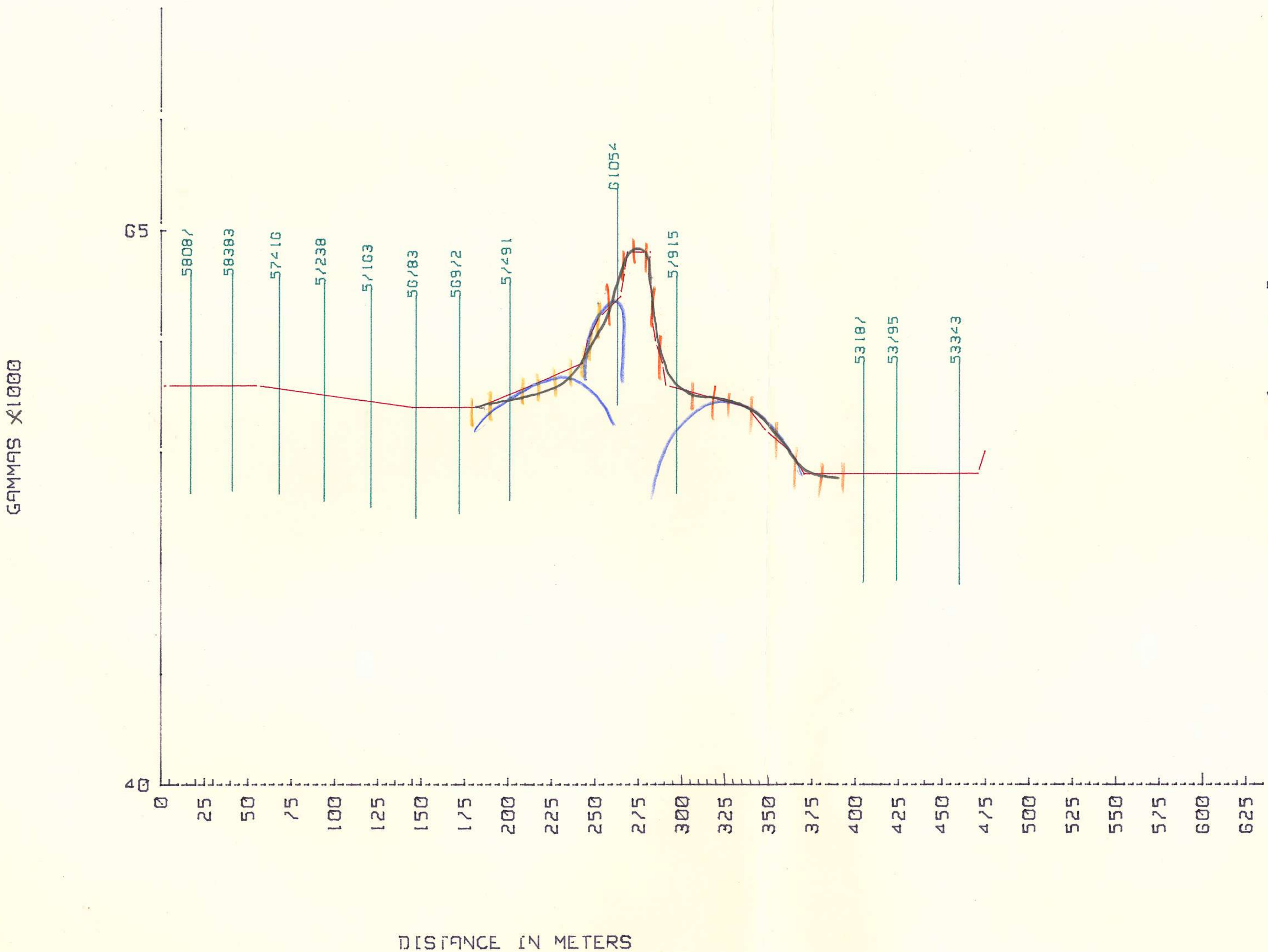
VERTICAL SCALE

1 TO 2.24719

Y EXAGGERATION

1 : 8.98876

BARB E-E'



HORIZONTAL SCALE
1 TO 2500

VERTICAL SCALE
1 TO 1.96629

V EXAGGERATION
1 : 7.86516