CGNHS OFR-1987-1
Connecticut Geological Survey
Department of Environmental Protection
79 Elm St., Hartford, CT

Gillette's Castle Borehole EI-3
Moodus, East Haddam, Connecticut

(-72.428405 41.420634)

Lithologic Logs

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Total 178 pages

INTRODUCTION TO THE GILLETTE CASTLE, CONNECTICUT, 1500', 1:12 BASEMENT DRILL CORE LOG

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The Gillette Castle, Connecticut, 1500' continuous basement drill core is here represented by 148 pages of 1:12 scale log, one 10' box to a page. The log begins with box #8 as the first seven boxes retrieved were of unconsolidated river sediment which was not saved. The log was reconstructed by Ambers (this work) almost entirely from a preexisting log by Wintsch and Bernitz with minimal first-hand observation of the core. The core was examined in randomly chosen boxes to determine if the necessary information to reconstruct the log in the new framework could be retrieved from the preexisting log. After examining several boxes in this manner it was decided the information in the preexisting log was sufficient, and because of time constraints relogging of the core would not be necessary.

The core was found to correlate well with the lithologies and fabrics associated with the Honey Hill Fault zone of SE Connecticut, and included downward: the Hebron Gneiss in which the well began, the Canterbury Gneiss, the Yantic and Lower Members of the Tatnic Hill Formation, and plagioclase gneisses, alaskites, and amphibolites of the Avalon Terrain. Ubiquitous ductile deformation fabrics and abundant brittle-ductile and brittle overprinting fabrics characterize the core and complicate lithologic description and interpretation.

As in all of the drawn representations of the cores studied, the Gillette Castle 1500' log should not be construed as indicating orientation of any fabric elements. The fabrics have been totally removed from relating to any direction except up and down.

See the SUMMARY OF LOGGING CONVENTIONS for aknowledgement of National Science Foundation support to Robert Wintsch which helped support early logging and this reconstruction of that work.

SUMMARY OF LOGGING CONVENTIONS USED IN THE DESCRIPTION OF CORE MATERIALS FROM THE 4764' DEEP WELL AT MOODUS, CONNECTICUT; 1000' WELL AT MOODUS, CONNECTICUT; AND 1500' WELL AT GILLETTE CASTLE, CONNECTICUT

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Summer - Fall, 1987

AKNOWLEDGEMENTS

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INTRODUCTION

The early summer 1987 drilling of the Moodus, Connecticut 4764' deep well made apparent the need for updating and coordinating information relating to basement drilling in Connecticut. This document forms the basis for standardizing the existing information on basement drilling in Connecticut, allowing the relationships between the different wells to be recognized.

Reexamination of all basement well materials was beyond the scope of this project so that various use was made of preexisting descriptions of the materials. The new materials from the Moodus 4764' well were completely examined and described. The core from the Moodus 1000' well was reexamined in its entirety and editions to the log prepared earlier by David London were made. The log prepared by Robert Wintsch and John Bernitz for the Gillette Castle 1500' well was spot checked against the core to determine its accuracy. It was determined to be sufficient for this compilation and was redrafted.

The new logs were constructed in a form which was designed to allow rapid appreciation of various details of each core section. In essence, a reproduction on paper of the actual appearance of each core was the goal. This was very well

realized in the Moodus 4764' 1:1 logs and sufficiently realized in the Moodus 1000' and Gillette Castle 1500' 1:12 logs. Notes accompanying each log section relating to lithology, fabrics and mineral segregations add detail to the drafted columns. It is very important to note that the core materials considered in the logs were not oriented when retrieved from their respective wells and therefore the fabrics shown in the logs bear no relation to the actual orientation of the features in the Earth except up and down.

A step-by-step scheme is suggested for examination of the log sheets which should aid in the total appreciation of each section. This SUMMARY OF LOGGING CONVENTIONS should always be available to consult when new symbols or abbreviations are encountered. Check each symbol or abbreviation to become familiar with each and do not assume that the meaning of a symbol or abbreviation is obvious as it may not be even though the attempt was made to make each symbol and abbreviation a reminder of it's meaning. When examining a new section, first note the drafted fabrics and contacts of the section. Then note the overall or host rock lithology for the section offset to the far right column with the key lithologies underlined. Each major break in fabric or lithology has it's host rock lithology described and each of these major subdivisions of the logs is shown by a thick lined break aligned in a centralized column in the right half of each page. Secondly, note details of the lithologies in the section placed a few spaces right of the log column, adjacent to the layer or body in question. Finally,

observe any specific fabric notes in the left half of the page. These fabrics are typically low-grade overprinting fabrics, and the fabrics shown by symbols on the log column usually are higher grade ductile fabrics. This approach to the logs is similar to the manner in which they were constructed and seems most useful.

ABBREVIATIONS USED IN THE LOGS

Abbreviations were found to be a necessary tool in logging to help reduce time in logging and prevent clutter from too many words on a page. In the drafted logs they continue to help reduce clutter. Three groups of abbreviations were used in logging and description: mineral abbreviations, general descriptor abbreviations, and fabric abbreviations. An alphabetized listing of each of these groups is provided here.

Mineral Abbreviations

Mineral abbreviations are most often the first part of a mineral name, but not always. These abbreviations are not all standard but were chosen to most easily remind one of the mineral in question.

act	actinolite
biot	biotite
chl	chlorite
cpx	clinopyroxene
diop	diopside
epid	epidote

Mineral Abbreviations cont.

fspar or F	feldspar
gnt	garnet
hbl	hornblende
Kspar or K	potassium feldspar
mgt	magnetite
musc	muscovite
plag or P	plagioclase
pyr	pyrite
qtz or Q	quartz
sill	sillimanite

General Abbreviations

Abbreviations of repeatedly used words were chosen to resemble the word in question. Again, use of these abbreviations resulted in less written material on each page which increased the clarity of the log.

acc	accessory
@	at
alt	altered, alteration
apprec	appreciable
blast	porphyroblast
blastic	porphyroblastic
dk	dark
diam	diameter
diss	disseminated

General Abbreviations cont.

frag(s)	fragments, fragment
lt	light
med	medium
MFS	mean fragment size (chip descriptions only)
mod	moderate, moderately
seg	segregation
tr	trace
v	very
w/	with

Fabric Abbreviations

Along with the symbols for fabric shown in the log columns, abbreviations were also used for fabrics in written descriptions where these were necessary. These abbreviations are summarized here.

fol	foliated, foliation
gfsc	granofelsic
gns	gneiss, gneissose
lin	lineated, lineation
myl	mylonitic
phyll	phyllitic
s	segregation, always prefixed by one or more mineral abbreviation(s)
sch	schist, schistose
vein or V	vein filled with a given mineral

LITHOLOGIC DESCRIPTIONS

Throughout all of the logs and the chip descriptions from the Moodus 4764' well, abbreviations for lithologies are used to designate the rock type in a certain interval. Accompanying many of the abbreviations in the logs are modifiers which indicate any deviations from the generalized descriptions of the lithologies given here. Familiarization with these definitions is crucial in understanding these logs and chip descriptions.

An important note is that terms traditionally reserved for fault rock fabric have occasionally been used in the descriptions of core and chip lithologies because of the inability to properly describe the mineralogy of the rock in hand specimen. Such "rock types" include microbreccia = microcataclasite, ultramylonite, mylonitic schist, phyllonite, and pseudotachyllite.

<u>alask</u> (alaskite)

subequal qtz, plag, Kspar

accessory biot, mgt, hematite

typically fleshy pink in color

grain size varies from .5 - 1.5 mm.

generally mod-well foliated and gneissose

Amph (amphibolite)

hbl 50 - 100%

plag 0 - 50%

biot 0 - 30 %

accessory apatite, pyrite, mgt, cpx

black, brown-black to dk greenish black in color

grain size varies from 1 - 3 mm.

generally mod-well foliated gneissose to schistose

Ap (aplite)

subequal qtz and plag, sometimes w/ minor Kspar up to 10%

accessory biotite up to a few percent

v. lt. gray to cream to white in color

generally < 1 mm. grain size

usually gneissose w/ recovered sucrosic grains

a common vein material in the Hebron Gneiss

BAS (biotite amphibole schist)

biot 50 - 100%

green amphibole usually act 10 - 50%

plag 0 - 20%

accessory tremolite, scapolite, pyr

dk. greenish brown to black in color

up to 2 mm. grained

schistose to myl schistose fabric

often cuts host rock foliation at a low angle
common in the Hebron Gneiss

BGG (biotite granitic gneiss)

subequal qtz, plag, kspar

biot at least 5% up to 10%

accessory musc, pyr, gnt

lt - med gray to pink in color

usually even grained from 1 - 2 mm.

poorly to well foliated and lineated, gneissose

largely restricted to layered granitic intrusions within the Hebron Gneiss

BHG (biotite hornblende gneiss)

plag	50 - 90%
qtz	0 - 30%
hbl	0 - 50%
biot	0 - 30%

accessory sphene, mgt, epid, Kspar

med - dk gray in color

even to irregular grained .5 - 4 mm.

poorly - well foliated and lineated, gneissose

abundant lithology in the Avalon Terrain

BHS (biotite hornblende schist)

biot	50 - 80%
hbl	20 - 50%

accessory sphene, mgt, plag (sometimes important)

dk. green black to black in color

variably grained .5 - 3 mm.

well foliated myl schistose fabric

BMS (biotite mylonitic schist)

biot	30 - 50%
qtz	30 - 50%
plag	10 - 30%
Kspar	0 - 10%

accessory musc, gnt, sill, apatite, pyr

medium - dk brown in color

highly variable grain size, .5 - 5 mm.

always v. well foliated myl sch fabric

segregations of qtz and qtz-fspar are common
a common rock type in the Honey Hill Fault zone

BPG (biotite plagioclase gneiss)

plag	70 - 90%
qtz	0 - 30%
biot	< 5% but always present
Kspar	0 - 20%

lt - med gray in color

even grained from .5 - 1.5 mm.

mod - well foliated and lineated, gneissose
often laminated

BQP (biotite quartz plagioclase schist)

biot	30 - 70%
qtz	20 - 30%
plag	20 - 30%
Kspar	0 - 15%

accessory hbl, diop, gnt, musc, scap, pyr, calcite

med - dk brown in color

fairly even grained .5 - 2 mm.

schistose fabric

varies from markedly biot-rich to plag-rich
common lithology in the Hebron Gneiss

LGG (leucogranitic gneiss)

a very similar lithology to BGG already described except that this lithology contains <5% biotite and is often musc bearing, is always white or lt. gray, and is sometimes fairly uneven grained

microbreccia

a v. fine rock with characteristics like those described later in the fabric symbols, which is commonly composed of Kspar, chl, qtz, mgt and ground host rock as determined by SEM backscatter imagery

MMS (muscovite mylonitic schist)

musc 20 - 50%

chl or biot 10 - 30%

qtz 20 - 40%

accessory plag, Kspar, pyr, gnt

med green gray to brown gray to silvery white in color

highly variable grain size, .5 - 5 mm.

always well foliated myl sch fabric

commonly w/ QS or QFS

myl sch (mylonitic schist)

a general name for rocks w/ myl sch fabric and having unique mineralogy. myl sch fabric is described later in the fabric symbols

PBS (plagioclase biotite schist)

plag 10 - 30%

biot 50 - 90%

qtz up to 10%

accessory hbl, diop, musc, Kspar, gnt, scap

dk. brown to black in color

highly variable grain size .5 - 5 mm.

well foliated schistose to myl sch fabric

this lithology commonly truncates foliations in the host lithology at a low angle. common in all rock units

pegmatite

a vein-type lithology with extremely variable and uneven grain size from .5 mm. to 3 cm. commonly contains qtz, plag, and Kspar in highly variable proportions with accessory biot, musc, tourmaline, gnt, chl, sulfide

phyllonite

a phyllitic appearing rock of variable mineralogy, but typically chl-musc-rich. this fabric is described later in the symbol description section

QDG (quartz diopside granofels)

qtz	30 - 60%
plag	20 - 30%
diop	10 - 30%

accessory act, scap, calcite, biot, tourmaline, sulfide, gnt

med greenish gray to green in color

even to variably grained .5 - 4 mm.

granofelsic to poorly foliated gneissose fabric

restricted almost entirely to the Hebron Gneiss

QFS (quartz feldspar segregation)

a thin, discontinuous vein material of variable grain size .5 - 10 mm. and composed entirely of quartz and feldspar most often plag. often occurs in highly deformed zones

QS (quartz segregation)

a thin, discontinuous pure quartz veinlette. often occurs in highly deformed zones

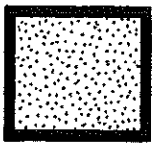
v. Qtz (vein quartz)

a planar, often quite thick, body of pure quartz

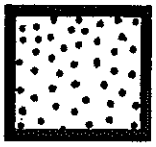
LOG SYMBOLS AND SHEET ORGANIZATION

The following sheets are the guide to all of the symbols, most of them fabric related, used in visually representing the cores considered in this project. Most of the symbols were independent of log scale (1:1 vs. 1:12) and these are given first. Some symbols did vary with log scale or were better represented on the log sheets, and are presented on actual log sheets. The description of the sheet organization is presented on the last 1:12 log sheet in a form similar to the instructions for GSA abstract format.

Micro- to cryptocrystalline black rock sometimes bearing minute mineral fragments. Fluidal characteristics are shown by intrusion of material into dikelettes off thicker dikes. Origin of this material is probably fault related as microbrecciation often accompanies this material. May include ultramylonites, microbreccias and pseudotachyllites.



Microbreccia having rock and mineral fragments visible with a 10X hand lense or greater magnification. Cements are given in the logs where they are discernable, but color is often the only indication of mineral content: green = chl and/or epid, black = mgt, brown = biot.



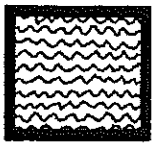
Breccia having rock and mineral fragments visible with the naked eye. Cements are given in the logs where they were discernable.

(a)

Mylonitic Schist (a). Very micaceous (greater than 30%) rock having clearly anastomosing foliation and lensoid fabric. Commonly exhibits "S-C" fabric. Blasts of plag and muscovite are common, but less than 10%. QS and QFS are very common and often abundant in zones with this fabric.

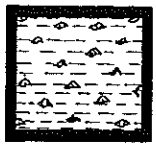
(b)

Blastomylonitic Schist (b). Identical fabric as (a), but bearing greater than 10% porphyroblasts.



Crenulated Schist. Very micaceous rock with well developed crenulation observable in hand sample. Commonly in chl-musc schists.

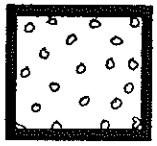
Phyllonite. Mica-rich (commonly chl-musc) rock with individual grains barely visible with a hand lense (that is phyllitic in appearance). In thin section these zones show highly anastomosing fabric indicative of shearing.



Ultramylonite. Ultra-fine grained rock of great variety of color resembling chert or flint. A streaky foliation is visible only as color variation, and thin less than 1 mm. partings are common parallel to the color bands. In thin section, minute feldspar clasts are visible. This fabric is commonly developed in low biotite and qtz rocks.

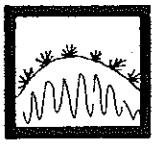
Augen Gneiss. Quartzofeldspathic rock usually metaigneous in origin bearing augen of feldspar in a finer grained groundmass of qtz, fspar, and some mica. The gneissose foliation in the rock is anastomosing and lensoid (myl). Pegmatites, BHG, and BGG commonly have this fabric developed.

Straight gneiss. Gneiss bearing high grade mineralogy and often being migmatitic with extremely planar foliation and quartzofeldspathic and micaceous laminae 1 - 3 mm. thick that extend for several meters when observed in outcrop. Where migmatitic, the leucosomes are in strong parallelism with laminae. Feldspar blasts up to several centimeters in diameter are common but not abundant enough to constitute an augen gneiss.



Spotted Plagioclase Blast Granofels. The recently described "blastocataclasite" of Wintsch (1985), which is described as a high grade brittle fabric overprinted by ductile shear. The rock is of unique character being biotite and sometimes muscovite rich with abundant (10 - 50%) plag blasts, generally not augen in shape. The micas are often very weakly foliated in a mylonitic fabric, but the overall appearance of the rock is granofelsic. This fabric often truncates host rock foliations at low angles.

Quartz Vein Filling. Planar layers filled with v's are interpreted as veins and discontinuous lenses, pods and layers are considered as segregations.



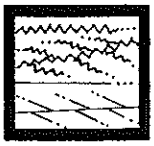
Mineral rosettes on some surface. Commonly exhibited by tourmaline on the walls of a vein.

Quartzofeldspathic Vein Material. X's stand for feldspar the variety of which is usually given, but if not is likely plag. V's stand for quartz. Planar layers are considered veins, and the type is given. Irregular bodies are segregations and often have no descriptors.

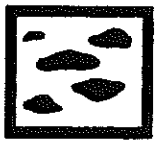
Feldspathic Vein Material. Uncommon feldspar veins were noted as well as segregations. The feldspar type is always given.

Single Plagioclase Grains. Designed to suggest albite twinning, this symbol was entirely restricted to the Moodus 4764' 1:1 logs.

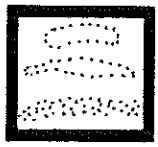
Single Microcline Grains. Designed to suggest tartan twinning in microcline, this symbol was entirely restricted to the Moodus 4764' 1:1 logs.



Fractures And Thin Fabric Elements. Jagged lines indicate rough fractures in the core and straight lines indicate smooth breaks in the core or less than 1 cm. thick fabric layers which are always described (usually in the left half of the log page). Unaltered fractures are not noted except in the MOodus 4764' logs. Alterations along fracture are always listed.



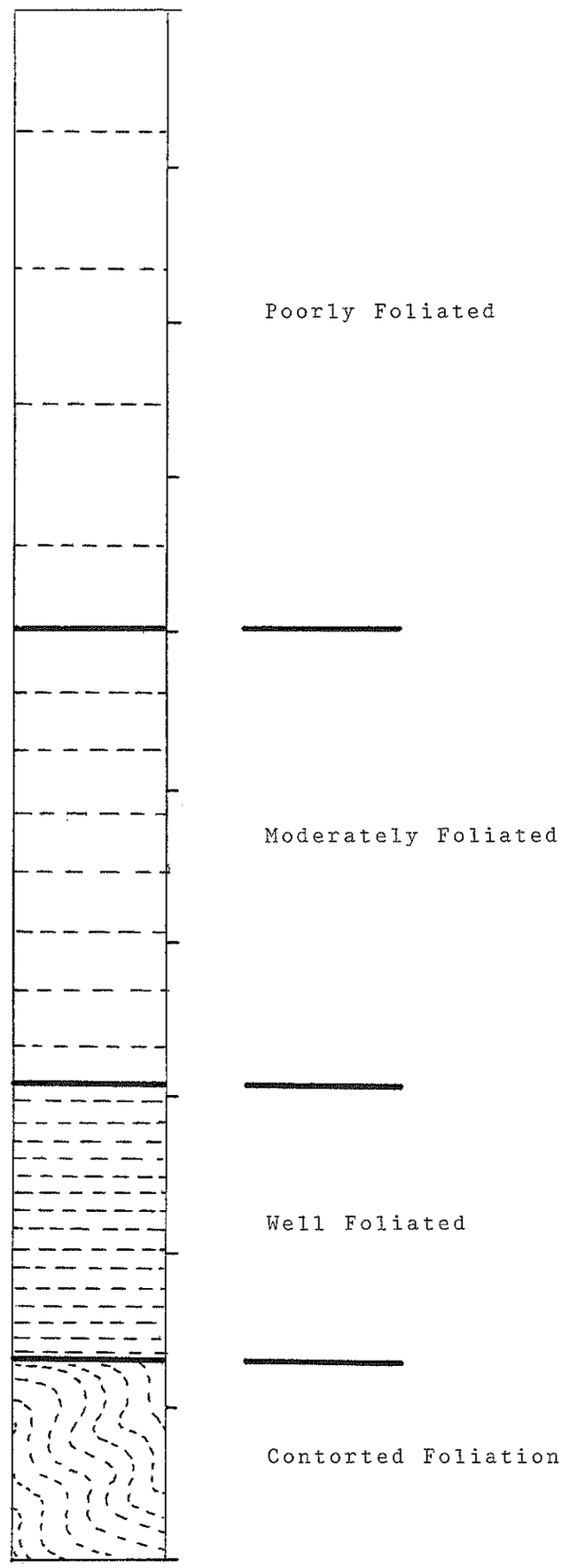
Dark Mineral Segregations. Tourmaline and hornblende were found in a few places in pod-like segregations that required a unique symbol. The mineralogy of the segregations are always given.



Mineral Concentration Zones. Dotted outlines define the perimeter of a diffuse mineral segregation, the mineral always given. A stippled pattern defines the region of a unique disseminated mineral.

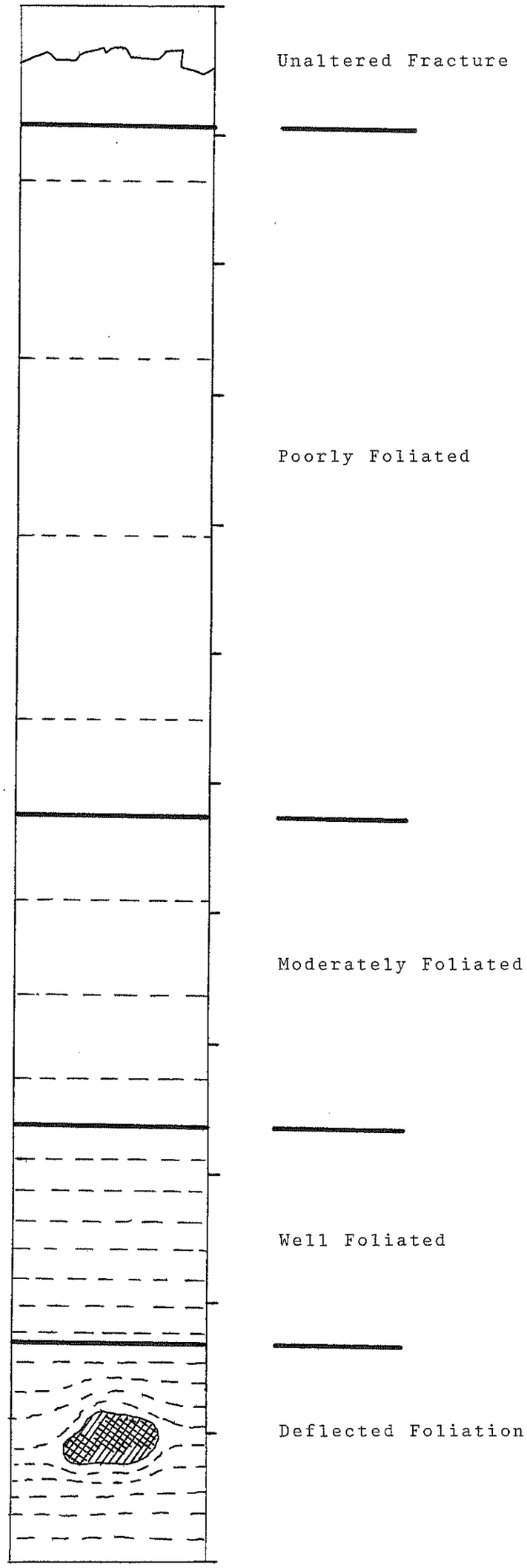
CORE LOG_____ BOX#_____ INTERVAL_____

Foliation Symbols Used In The 1:12 Logs.



CORE LOG_____ BOX#_____ INTERVAL_____

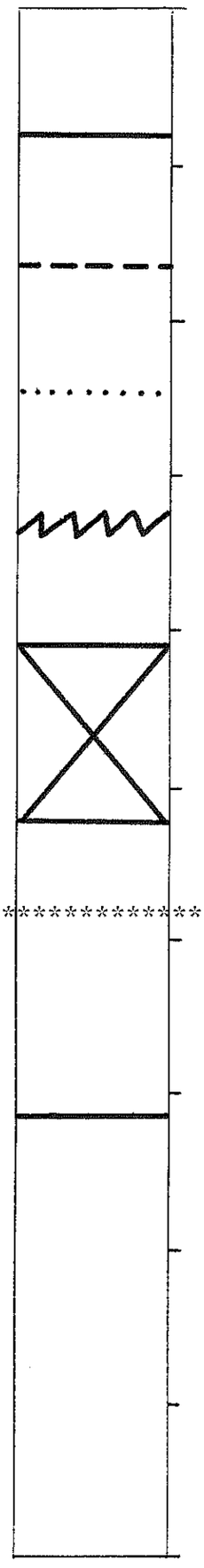
Foliation and Fracture Symbols Used in the 1:1 Logs.



CORE LOG_____ BOX#_____ INTERVAL_____

Contacts and Other Log Symbols

Sheet Organization (below ******)



Sharp Lithologic Contact

Gradational Lithologic Contact over 1 - 2 cm.

Gradational Lithologic Contact over Greater Than 2 cm.

Skip in log over homogeneous section. Footages given above and below skip give amount of compressed log.

Section not recovered or sampled by drilling firm for physical testing. Not used in the Moodus 4764' logs.

****

This line separates major breaks in lithology or fabric in the log.

The overall host rock of the sectio is described in this region with the key terms <u>underlined</u>.

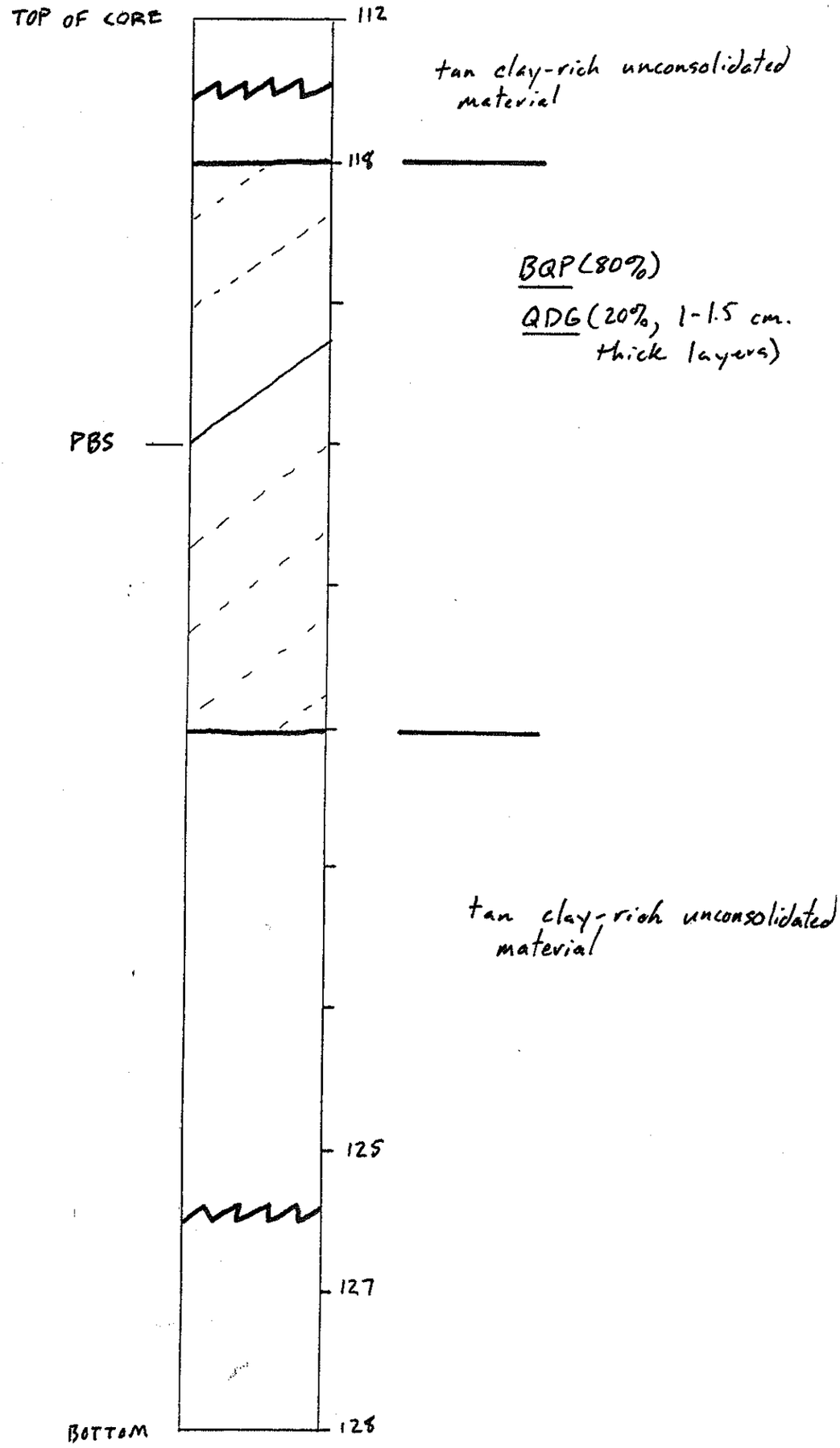
Fabric observations not readily shown by symbols on the log column appear in this portion of the log sheet. As brittle features tend to be thin and ductile features wide, this area is generally restricted to low grade brittle fabrics.

Detailed observations about the core are placed adjacent to the column, next to the item in question.

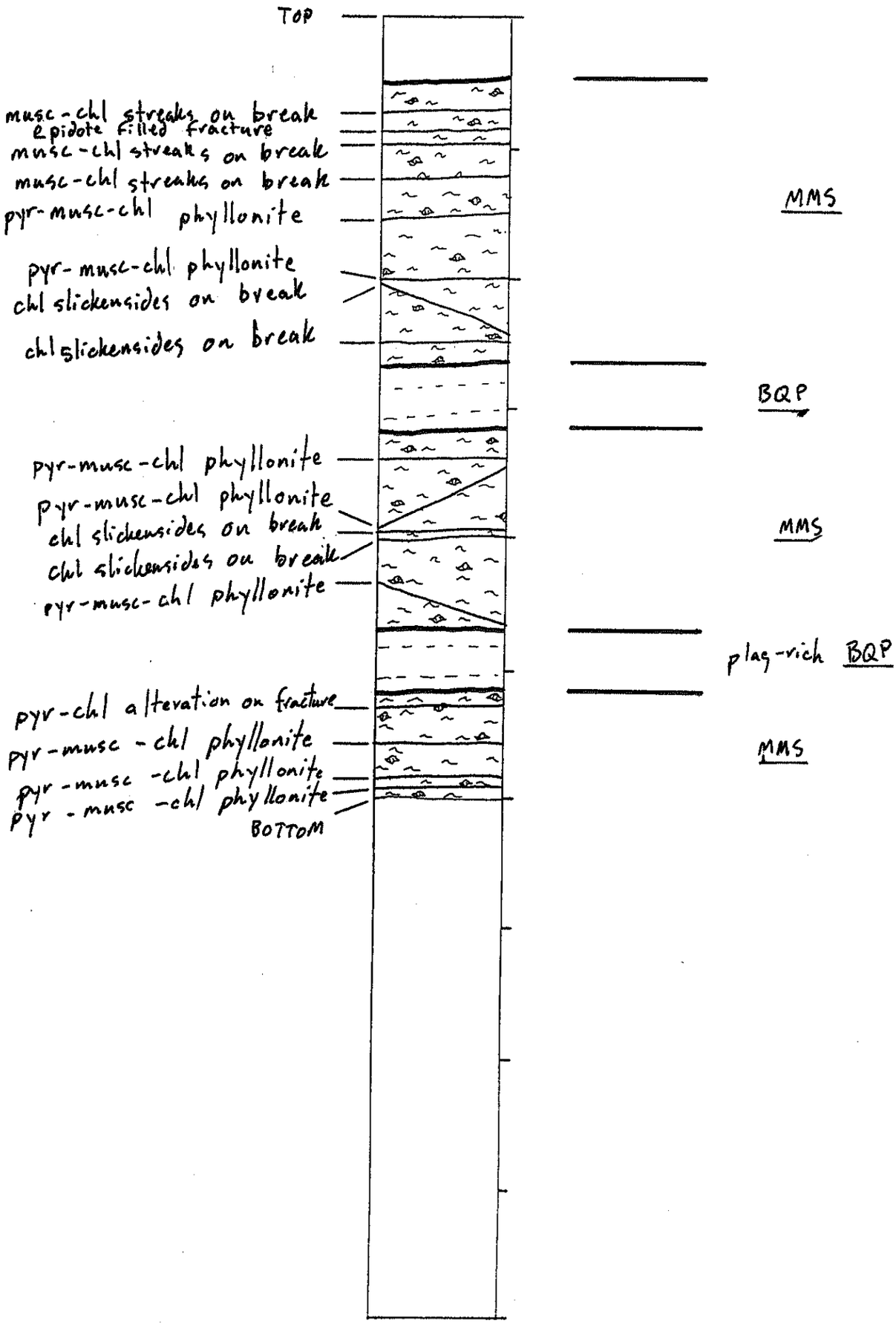
SUMMARY

The product of this work is an internally consistant set of logs for the three drill holes considered and a description of chips from the Moodus deep well in a similar context. The rules developed, and here presented, under which this "homogenization" of the work to date has been accomplished are hoped to assist in future examination of these materials and notes as well as to guide future description of new materials from the basement rock of Connecticut.

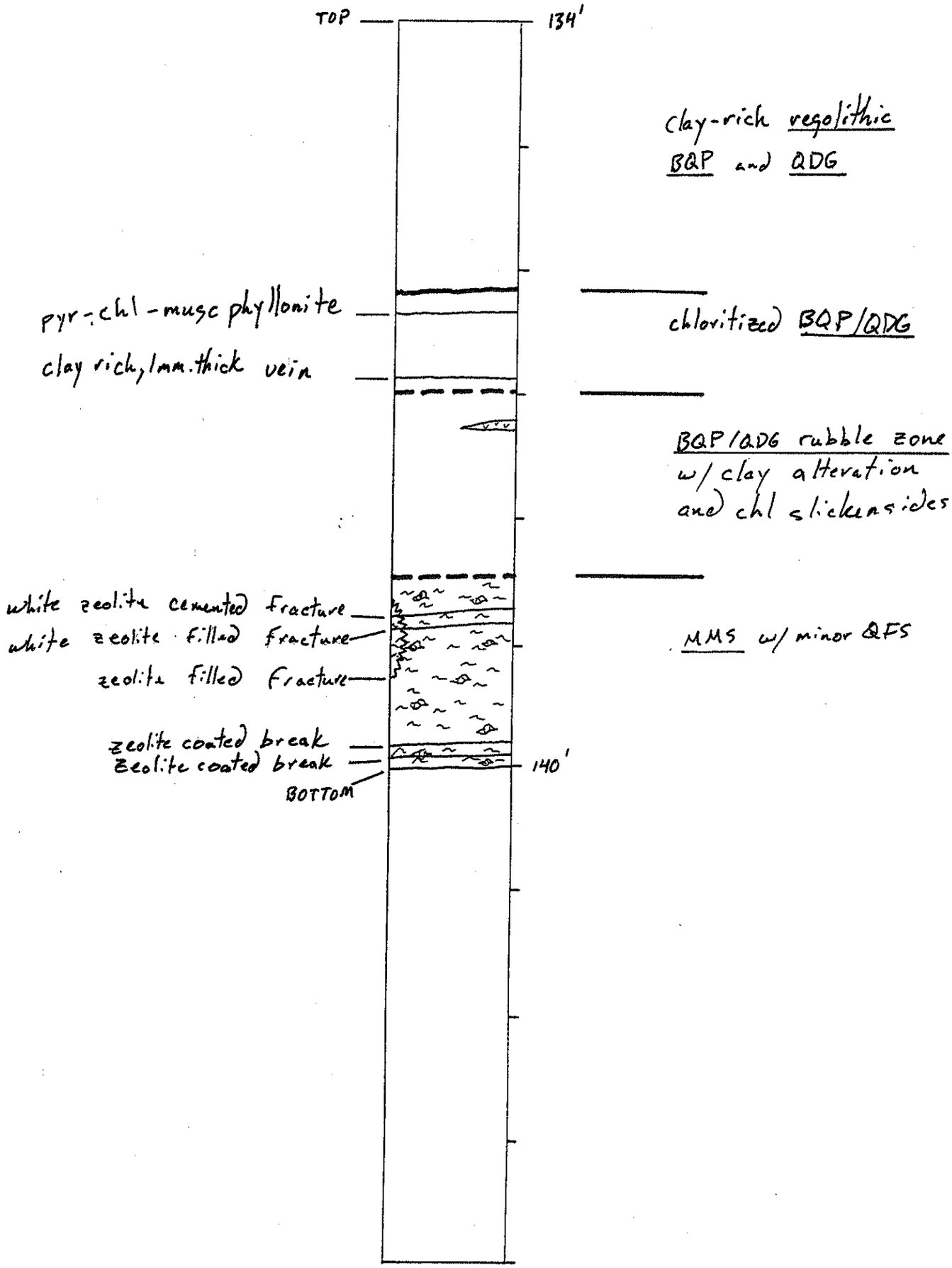
CORE LOG Gillette Castle BOX# 8 INTERVAL 112' - 128'



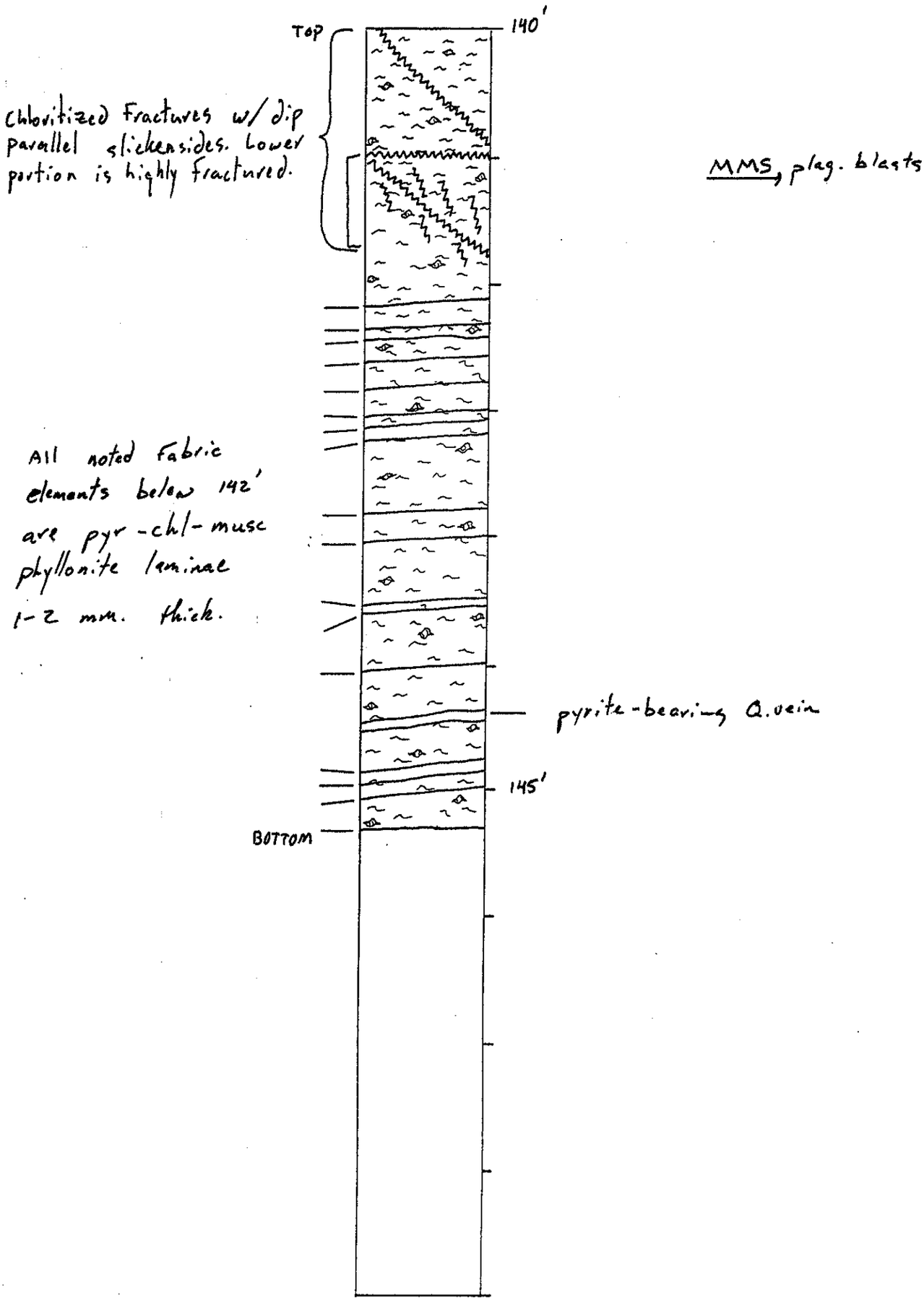
CORE LOG Gillette Castle BOX# 9 INTERVAL 128.0' - 134.0'



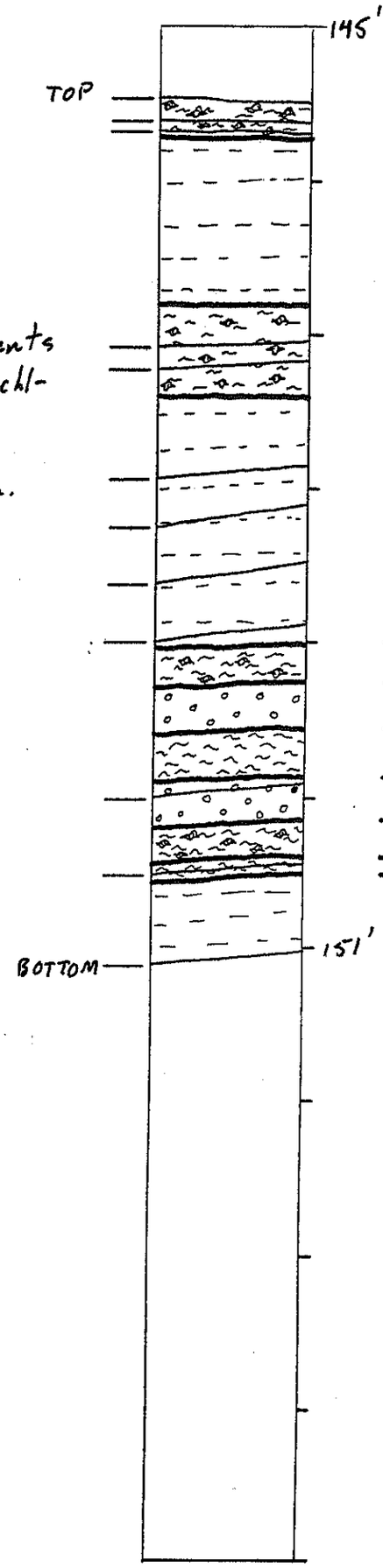
CORE LOG Gillette Castle BOX# 10 INTERVAL 134.0'- 140.0'



CORE LOG Gillette Castle BOX# 11 INTERVAL 140.0' - 145.2'



CORE LOG Gillette Castle BOX# 12 INTERVAL 145.2' - 151.0'



MMS, plag-blasts

pyr-musc-bearing BQP

MMS, plag. blasts

musc-bearing BQP

biot-rich MMS, plag blasts

BQP

MMS

BQP

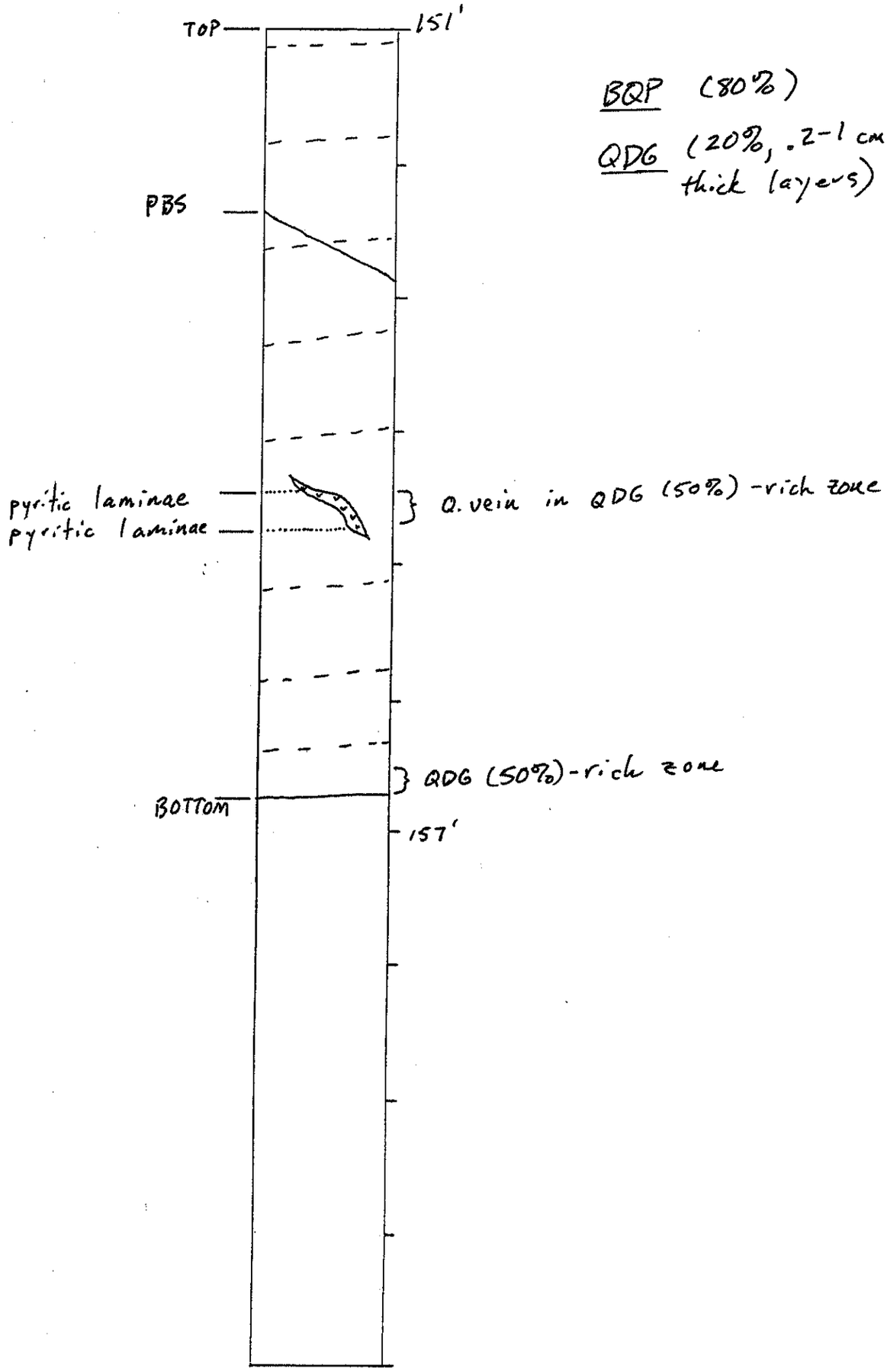
BMS, plag. blasts

MMS

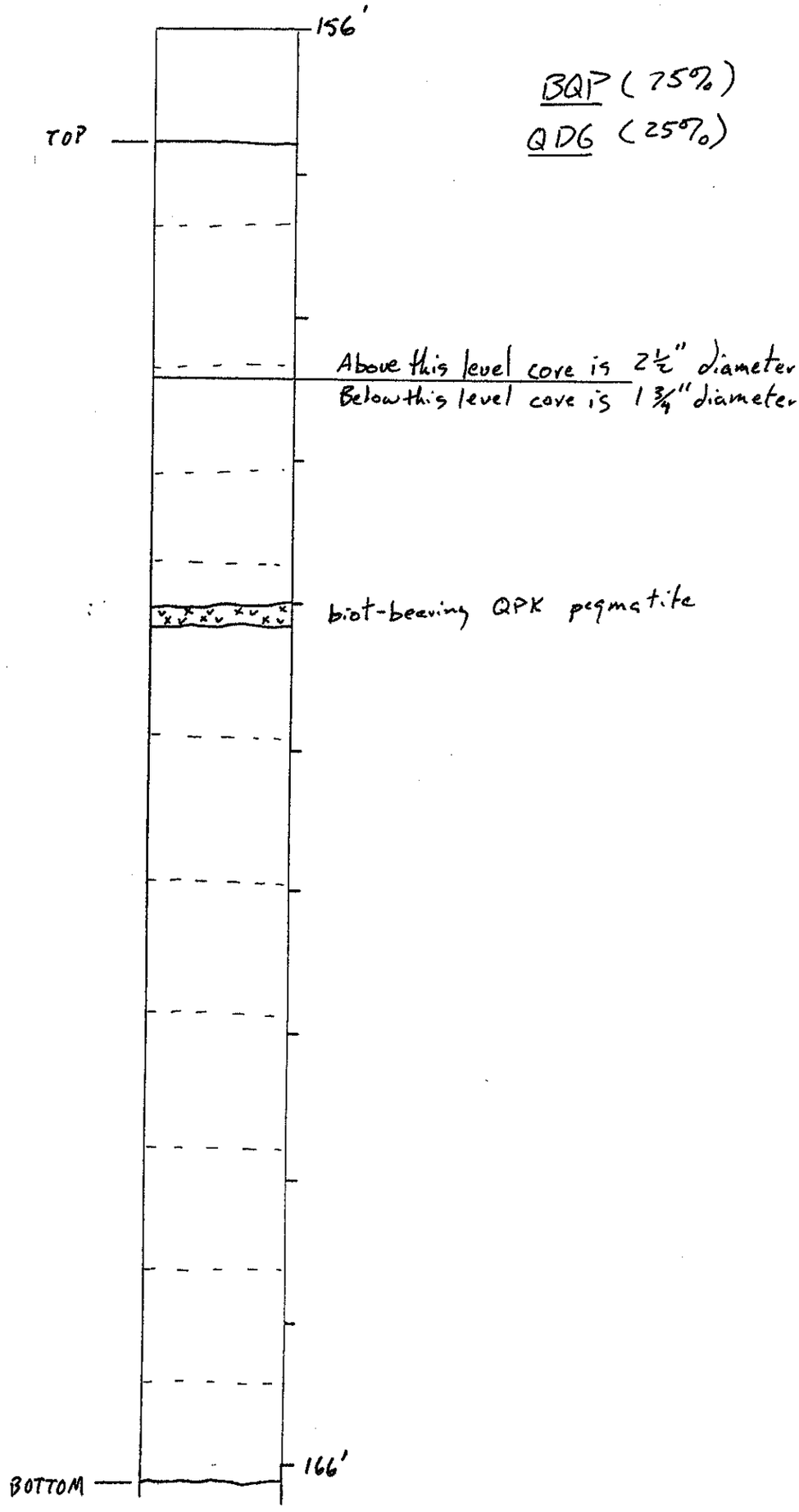
BQP

All fabric elements noted are pyr-chl-musc phyllonite laminae 1-2 mm. thick.

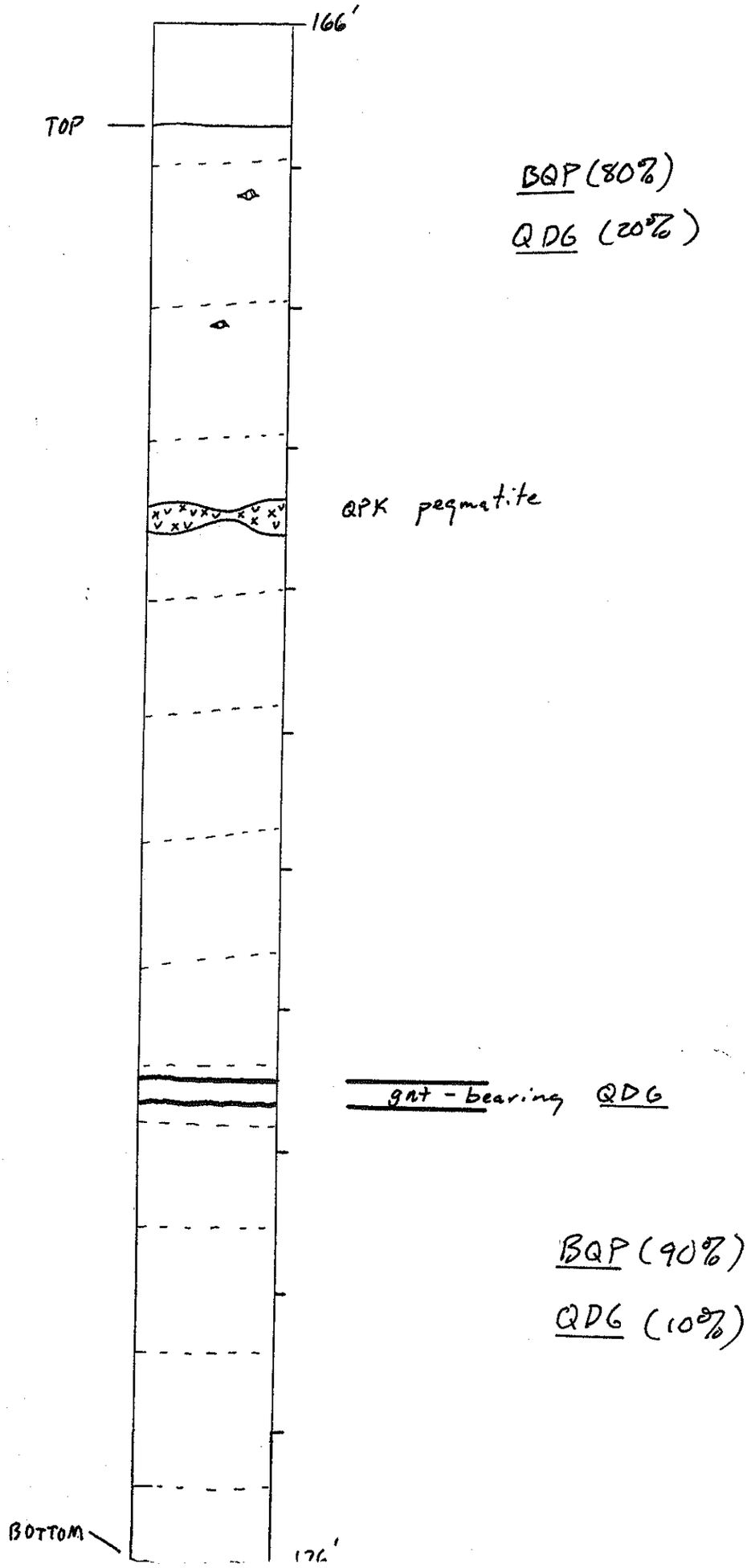
CORE LOG Gillette Castle BOX# 13 INTERVAL 151.0' - 156.8'



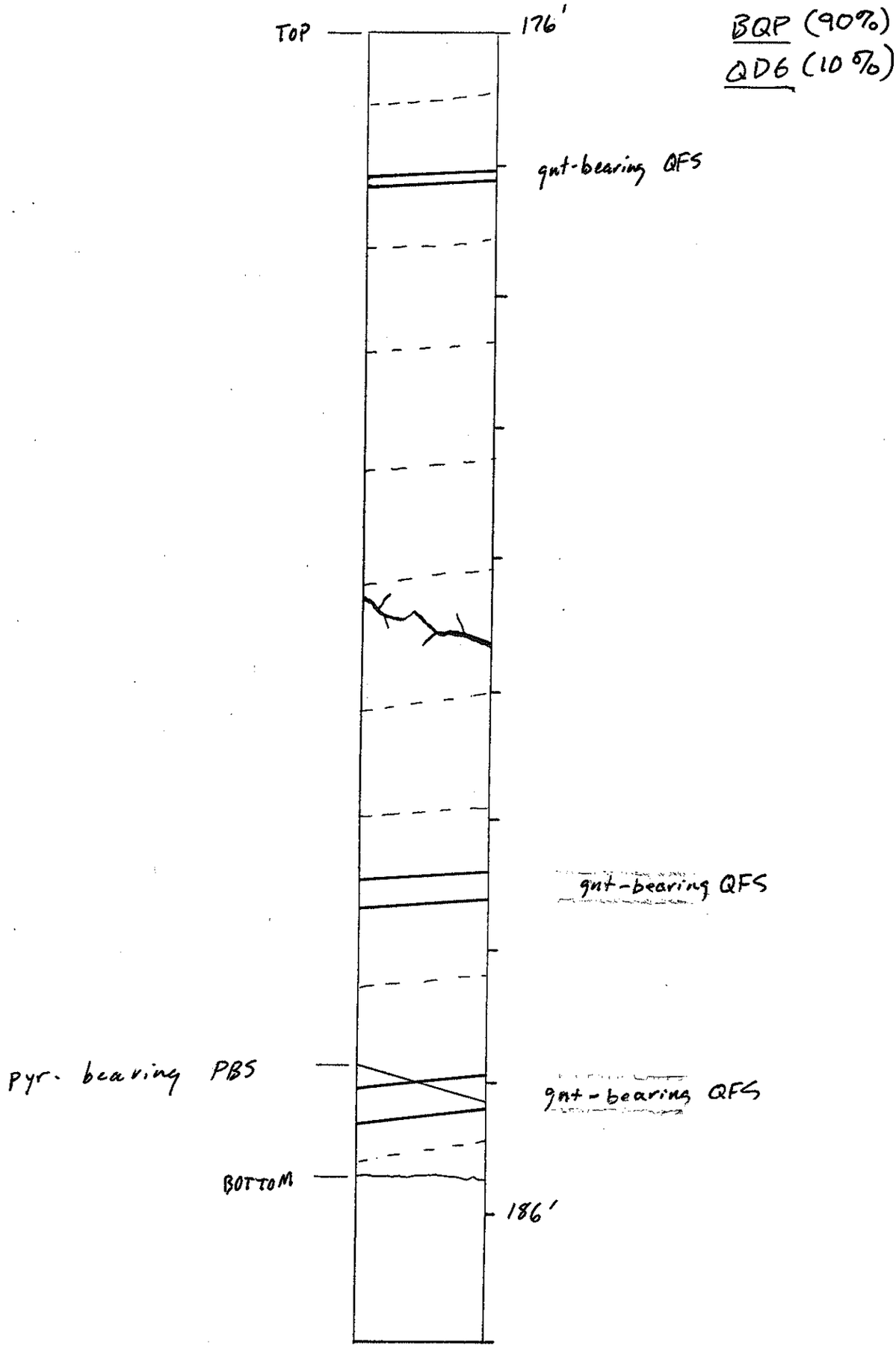
CORE LOG Gillette Castle BOX# 14 INTERVAL 156.8' - 166.2'



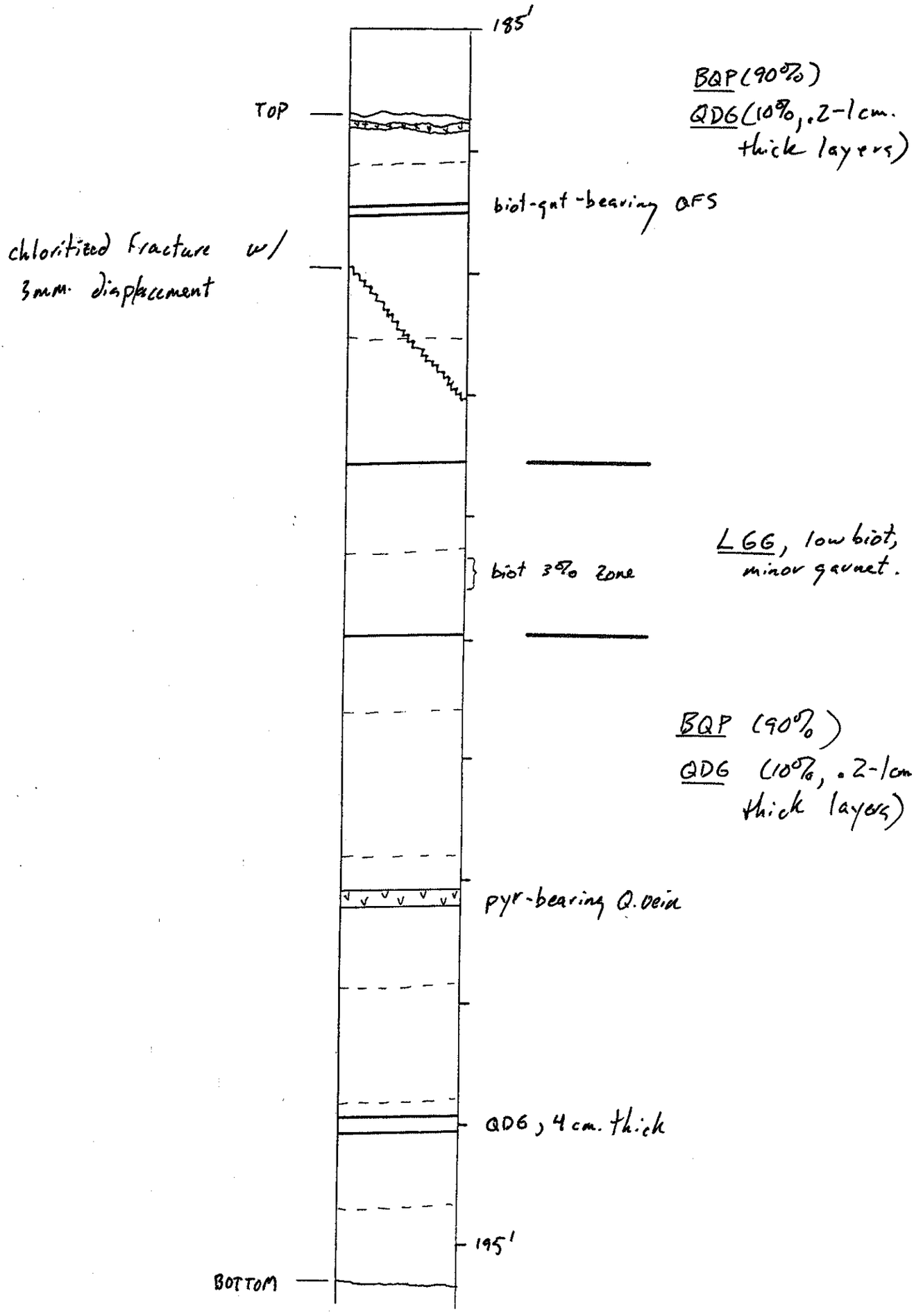
CORE LOG Gillette Castle BOX# 15 INTERVAL 166.2'-176.0'



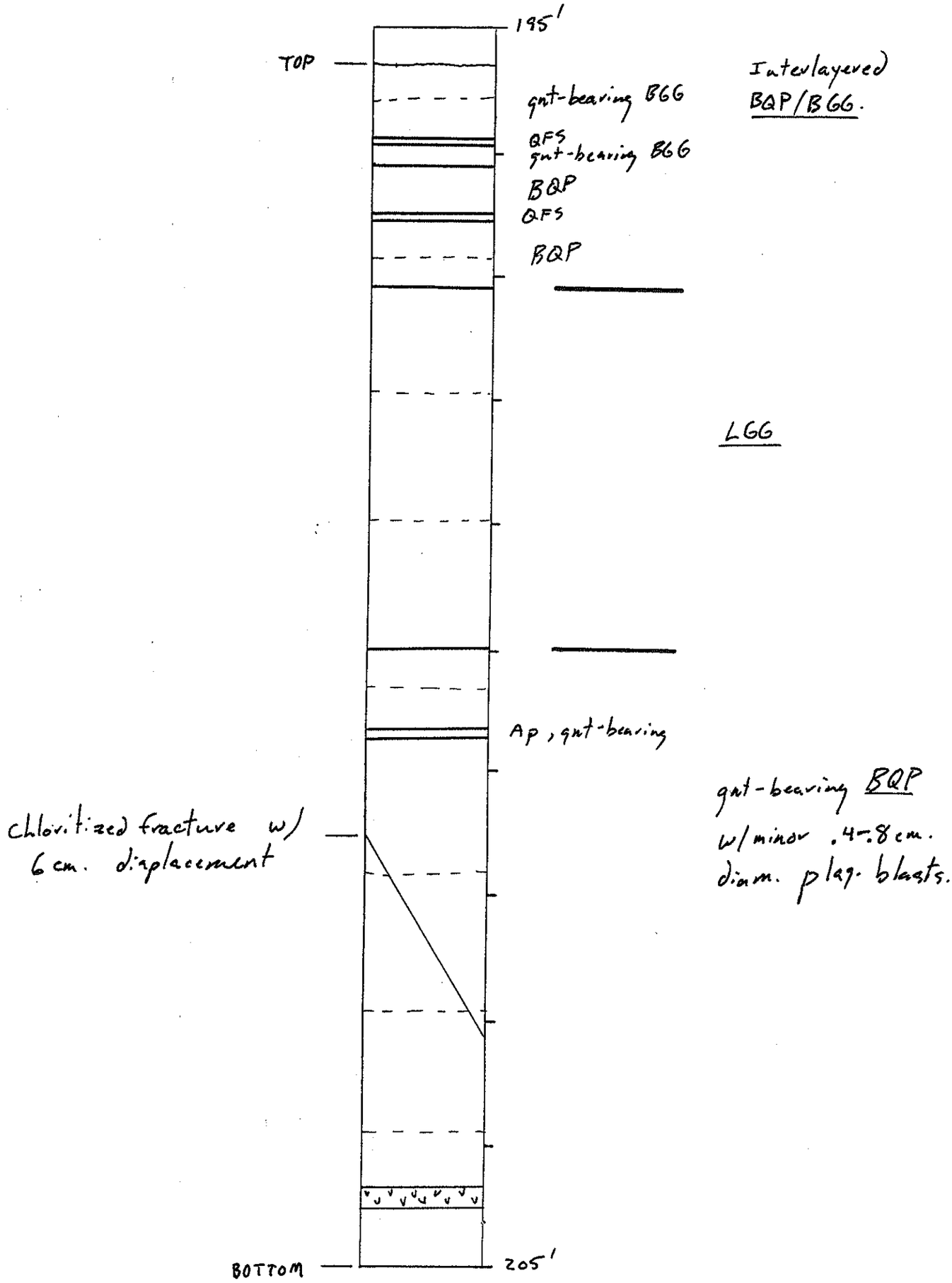
CORE LOG Gillette Castle BOX# 16 INTERVAL 176.0' - 185.7'



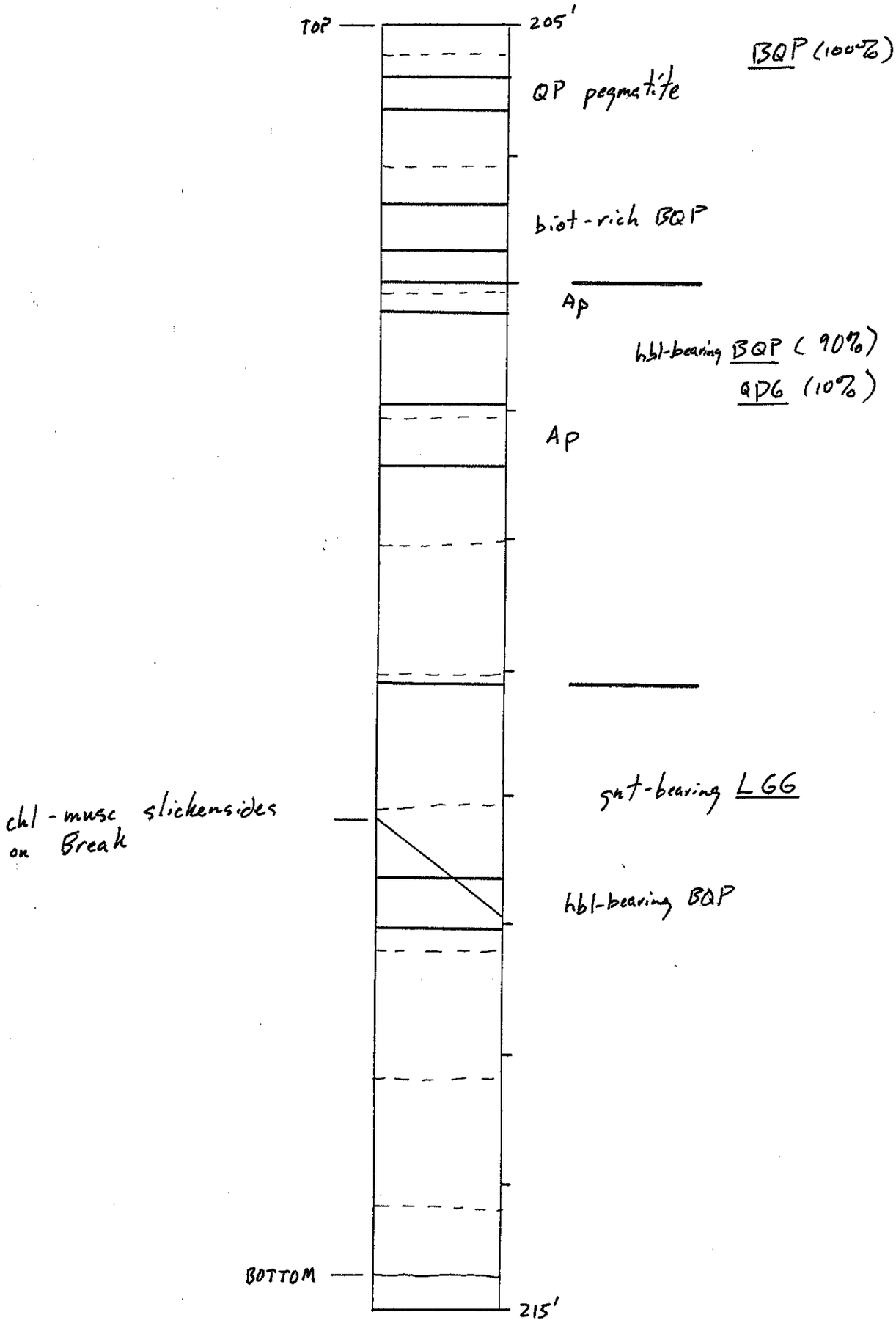
CORE LOG Gillette Castle BOX# 17 INTERVAL 185.7'-195.4'



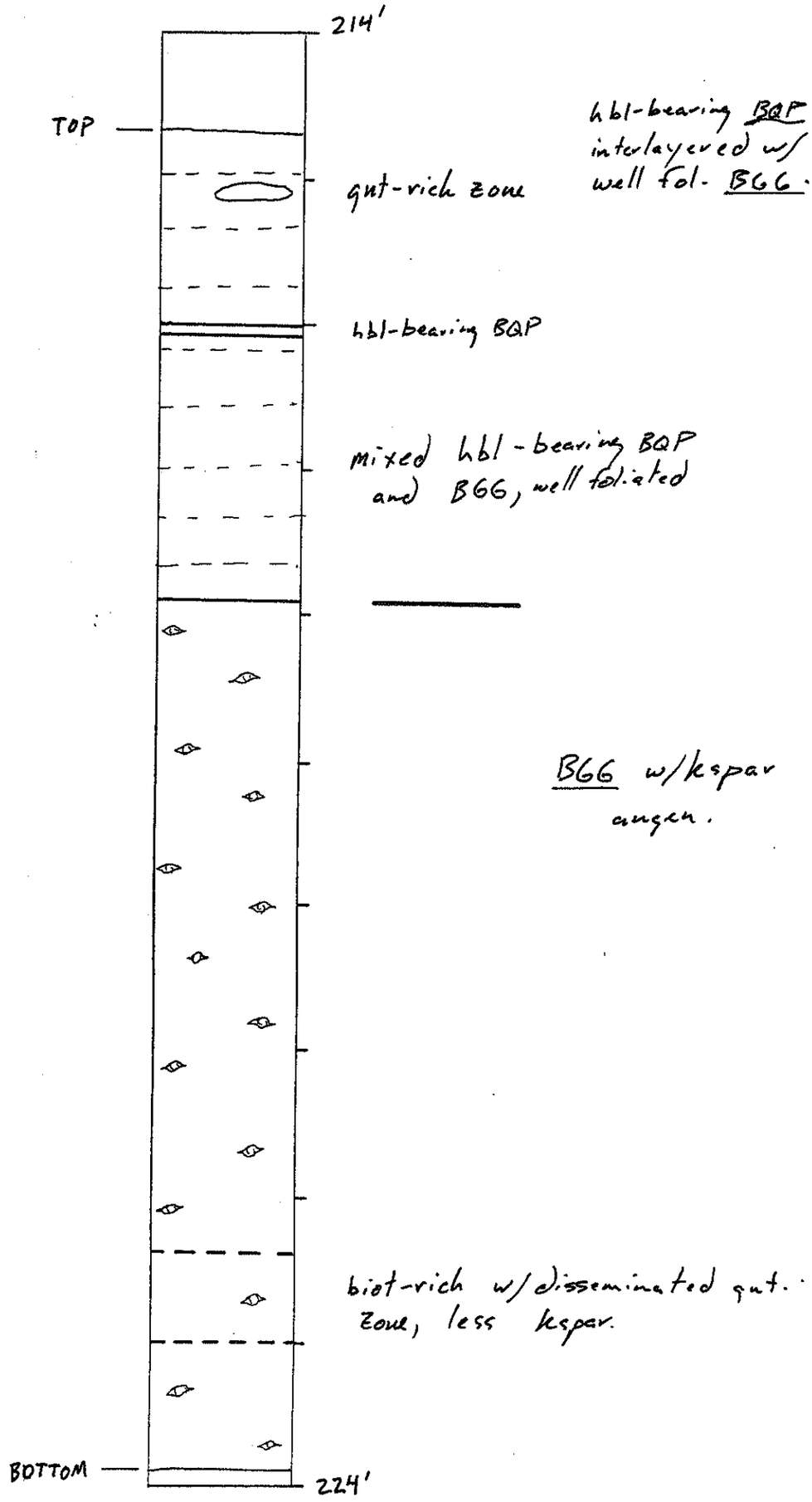
CORE LOG Gillette Castle BOX# 18 INTERVAL 195.4' - 205.0'



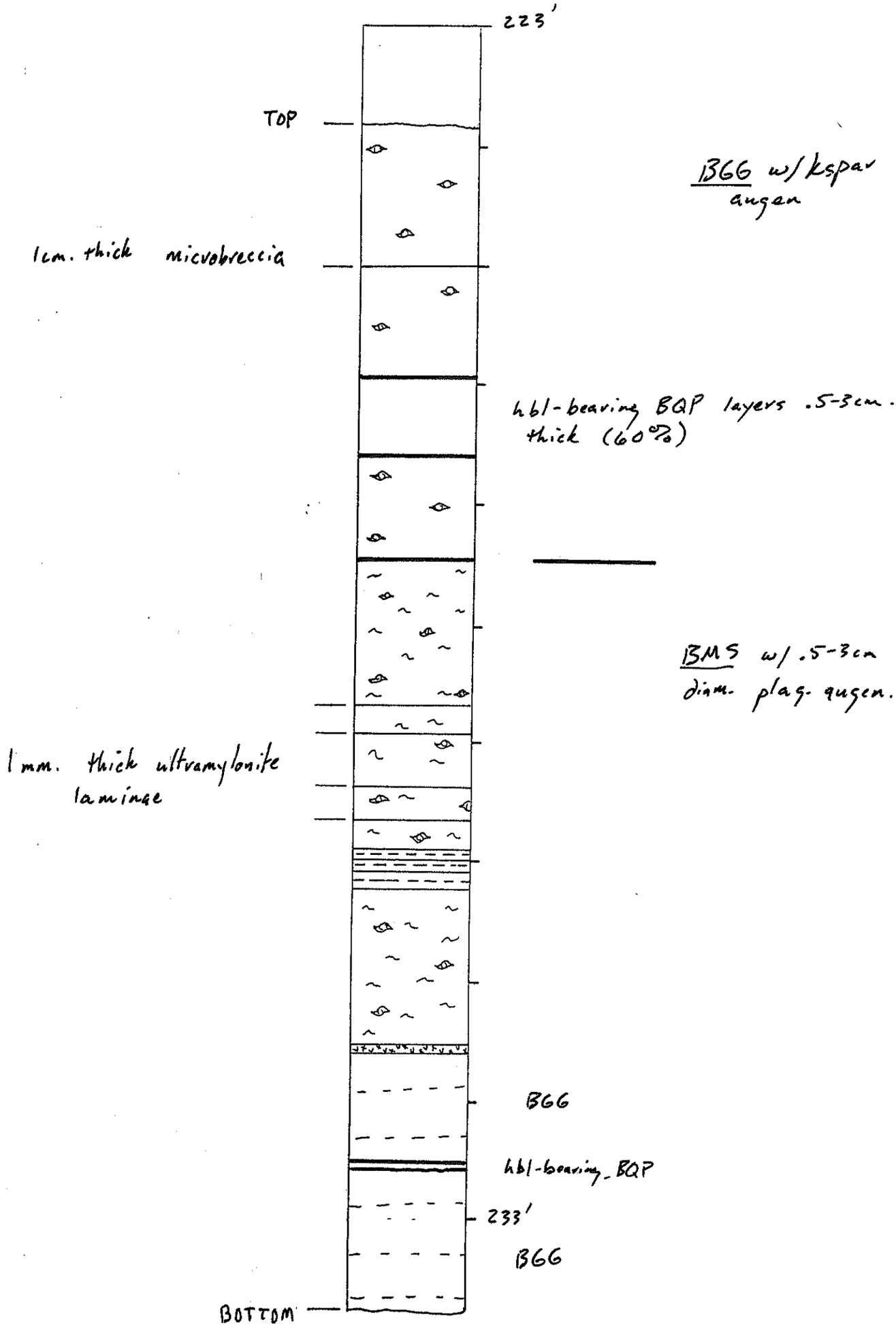
CORE LOG Gillette Castle BOX# 19 INTERVAL 205.0' - 214.7'



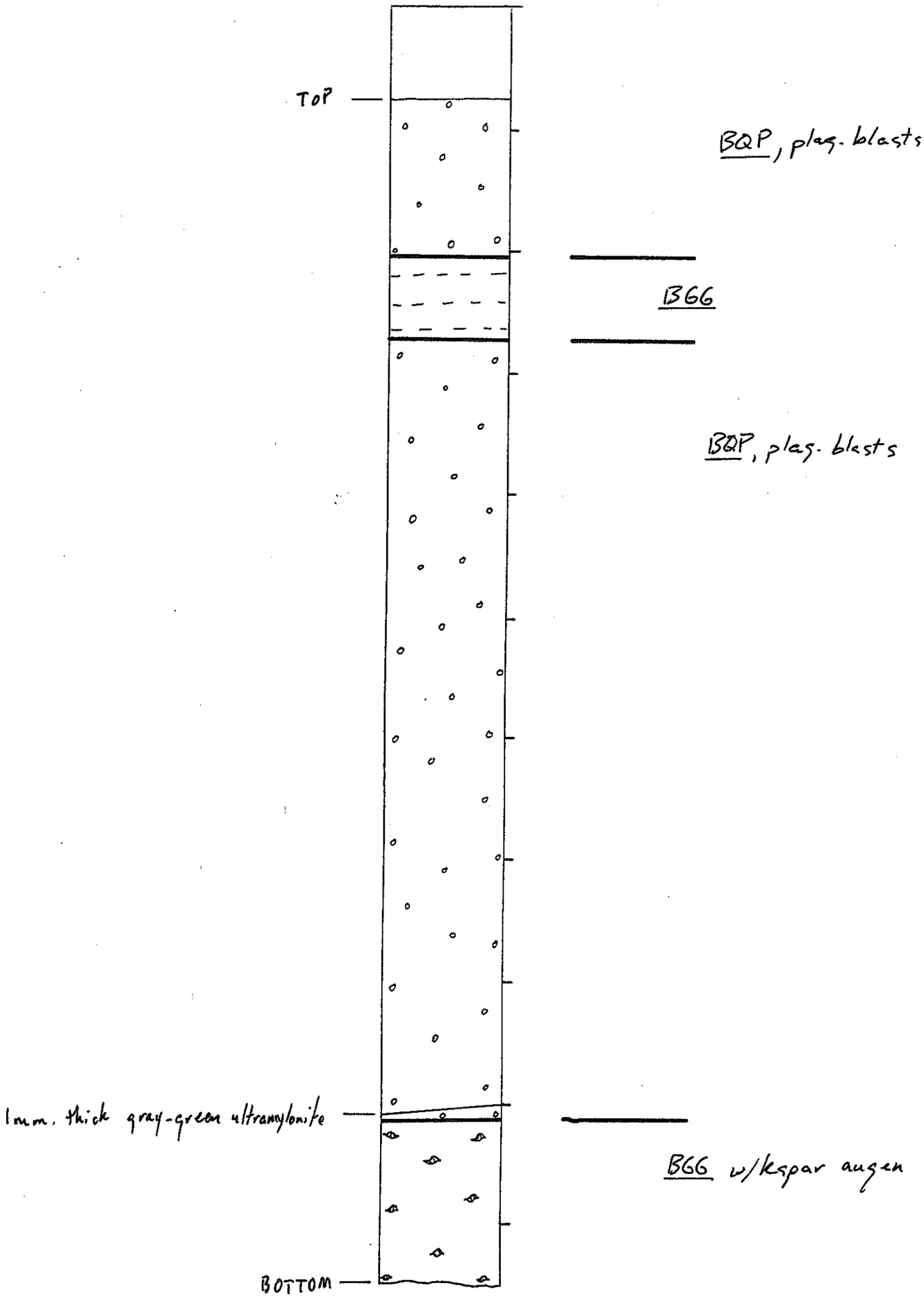
CORE LOG Gillette Castle BOX# 20 INTERVAL 214.7' - 223.9'



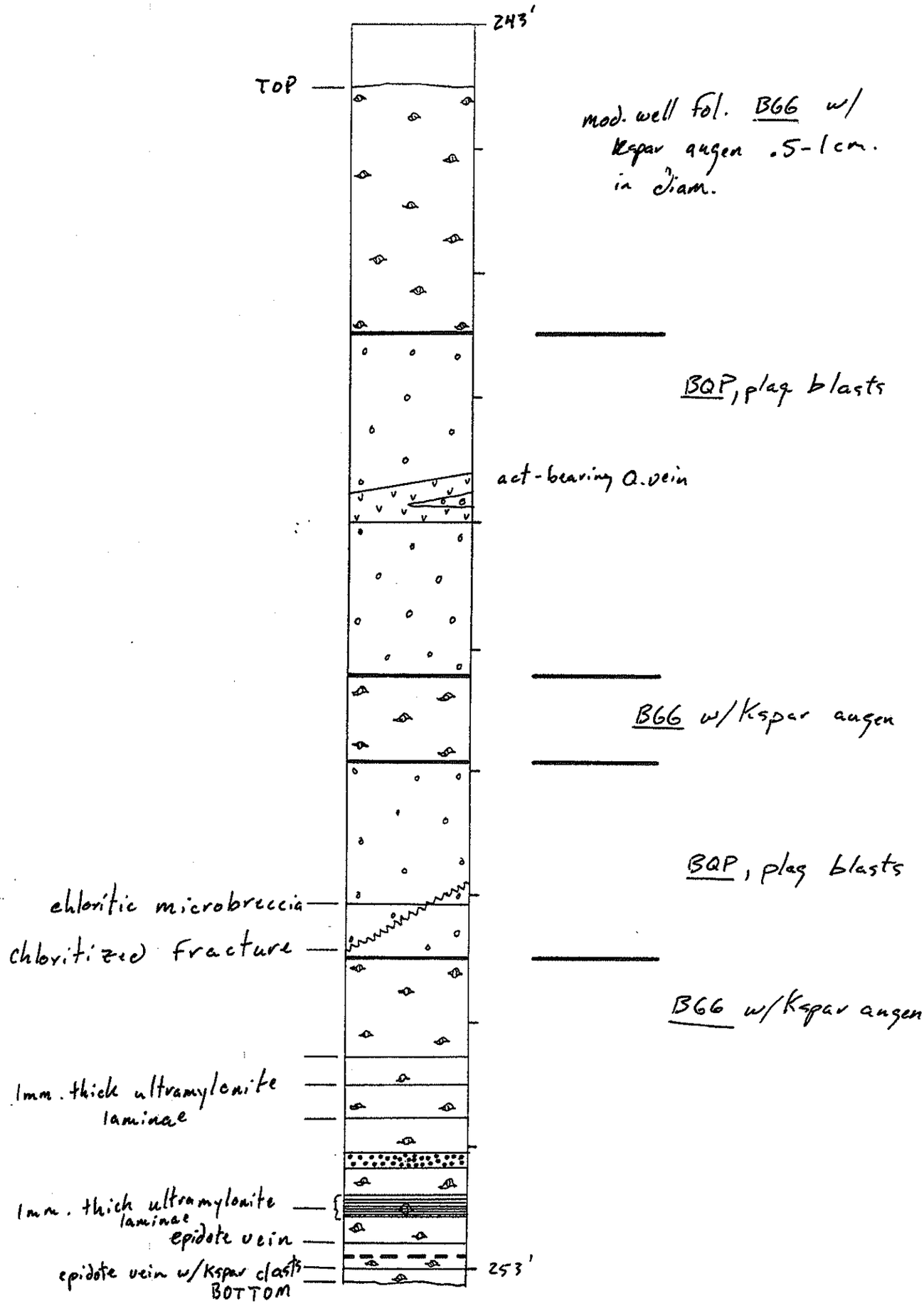
CORE LOG Gillette Castle BOX# 21 INTERVAL 223.9' - 233.7'



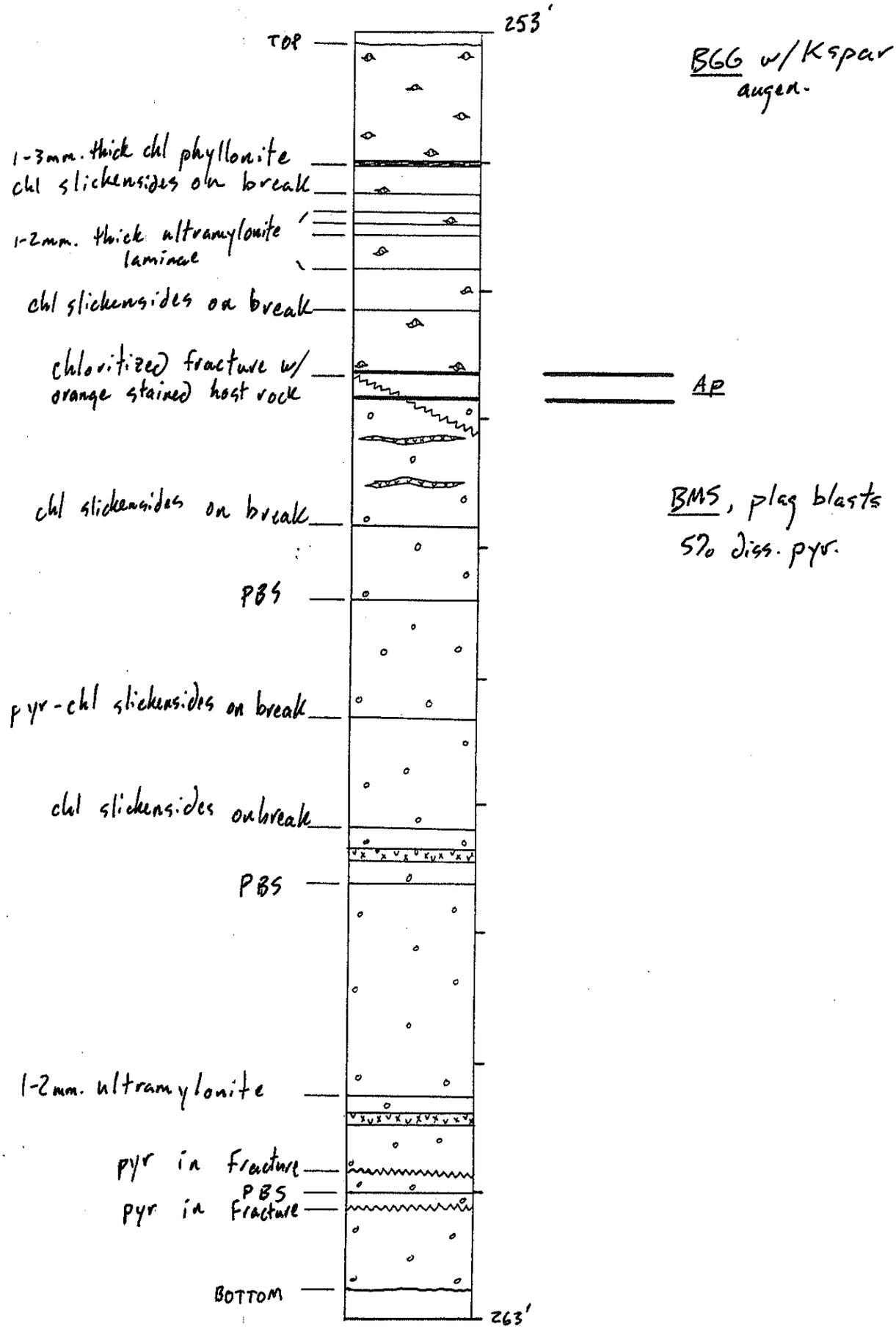
CORE LOG Gillette Castle BOX# 22 INTERVAL 233.7' - 243.5'



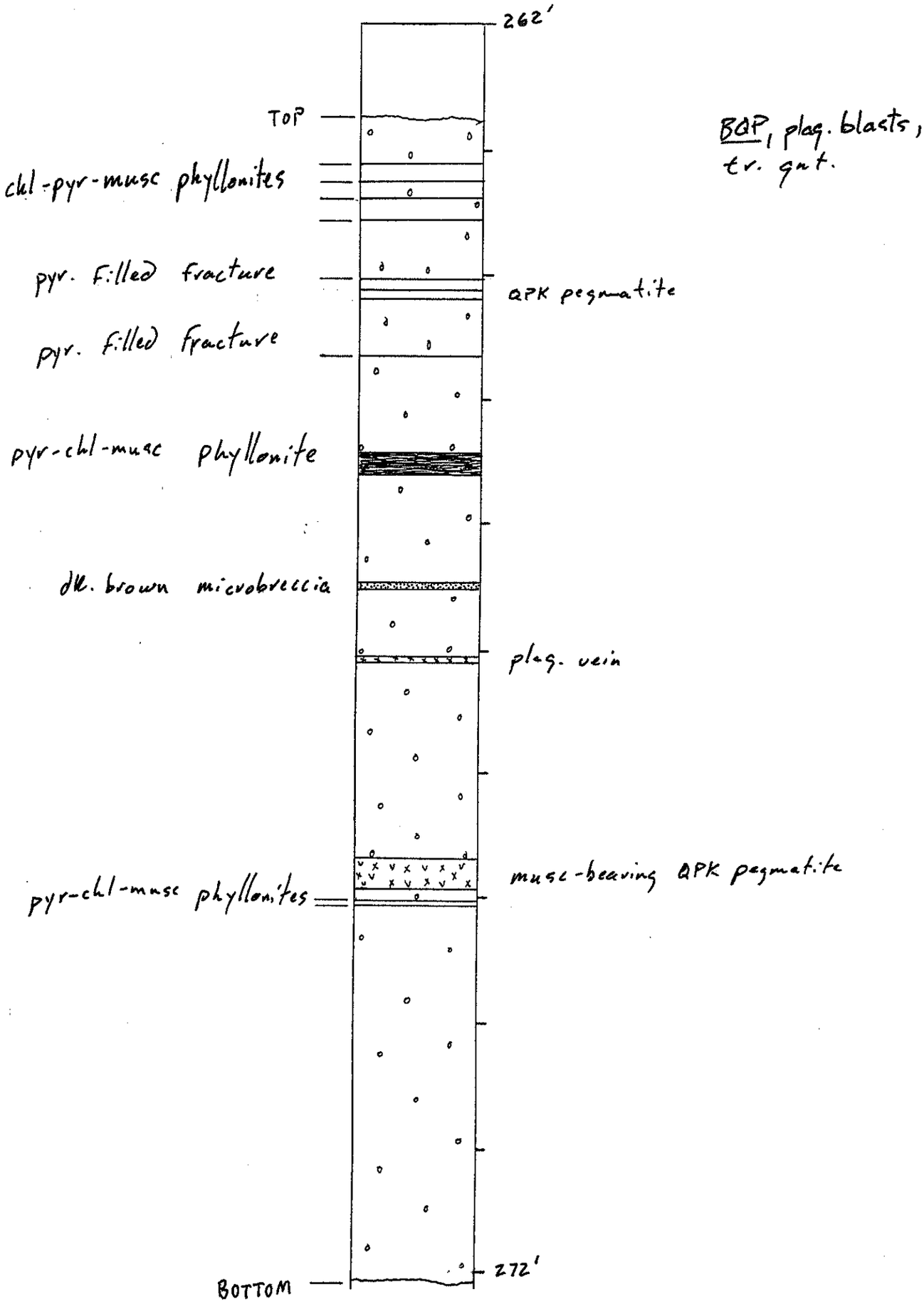
CORE LOG Gillette Castle BOX# 23 INTERVAL 243.5' - 253.1'



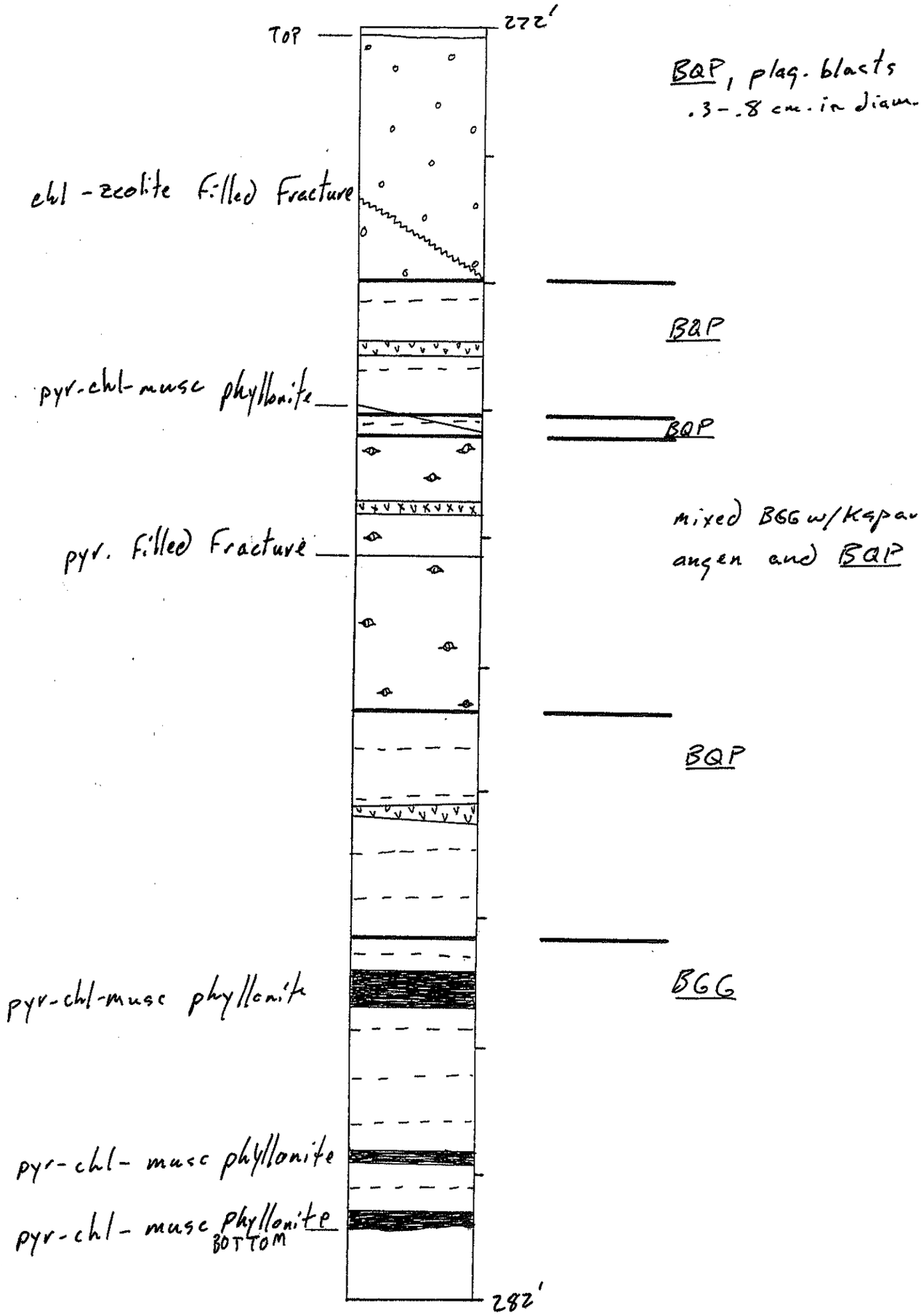
CORE LOG Gillette Castle BOX# 24 INTERVAL 253.1' - 262.6'



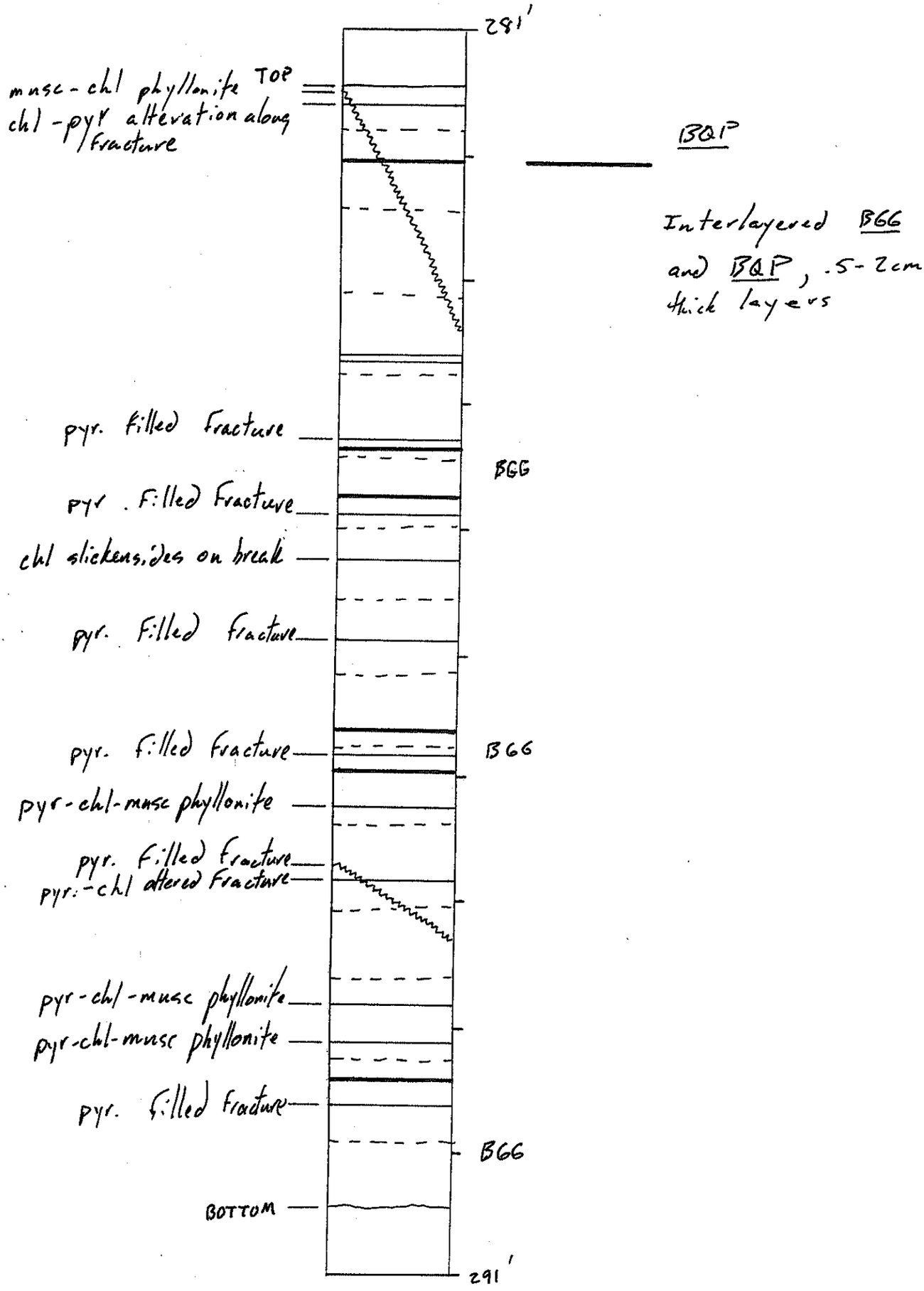
CORE LOG Gillette Castle BOX# 25 INTERVAL 262.6' - 272.1'



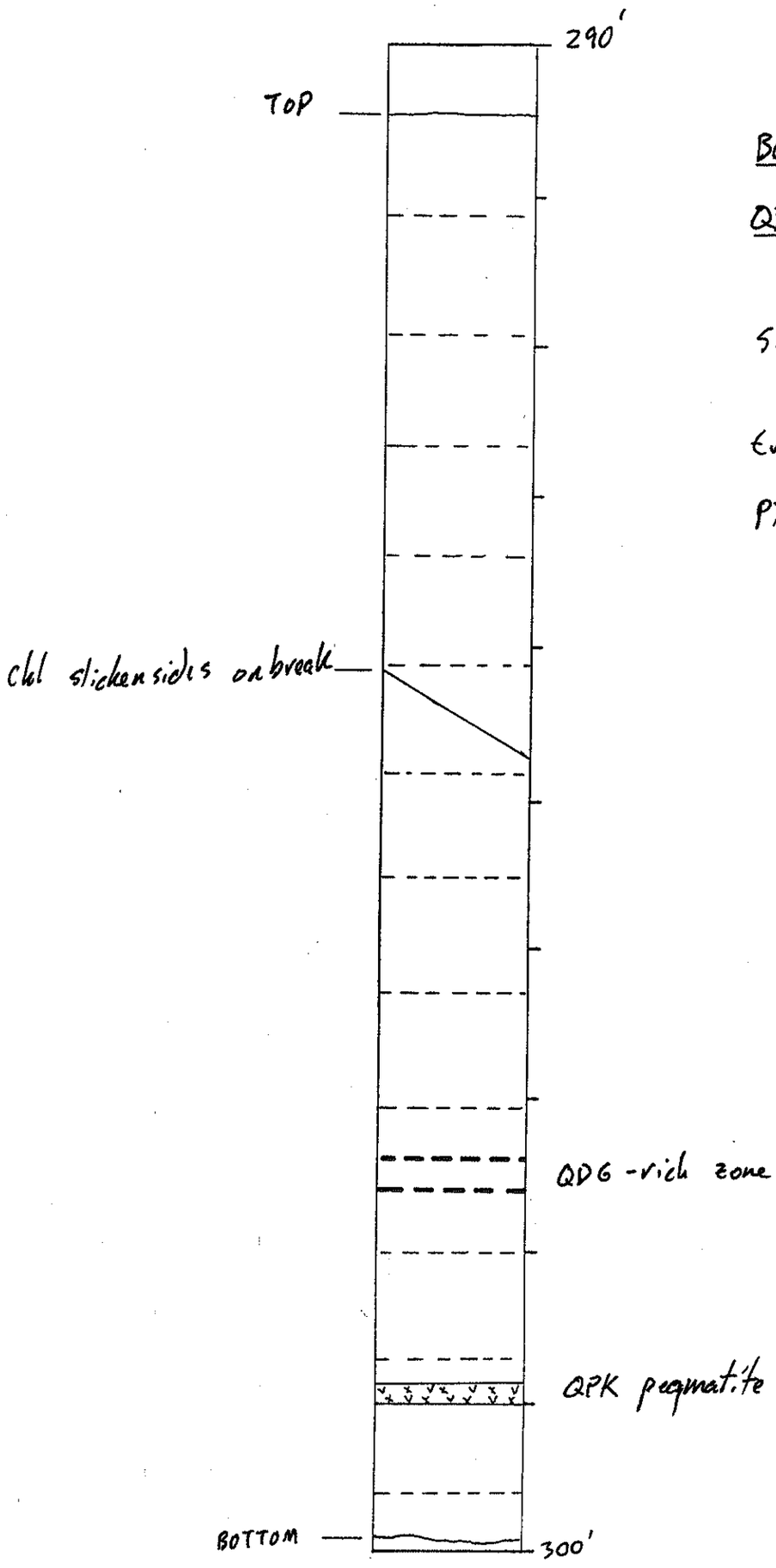
CORE LOG Gillette Castle BOX# 26 INTERVAL 272.1' - 281.4'



CORE LOG Gillette Castle BOX# 27 INTERVAL 281.4' - 290.4'



CORE LOG Gillette Castle BOX# 28 INTERVAL 290.4' - 299.9'



BQP (80%)

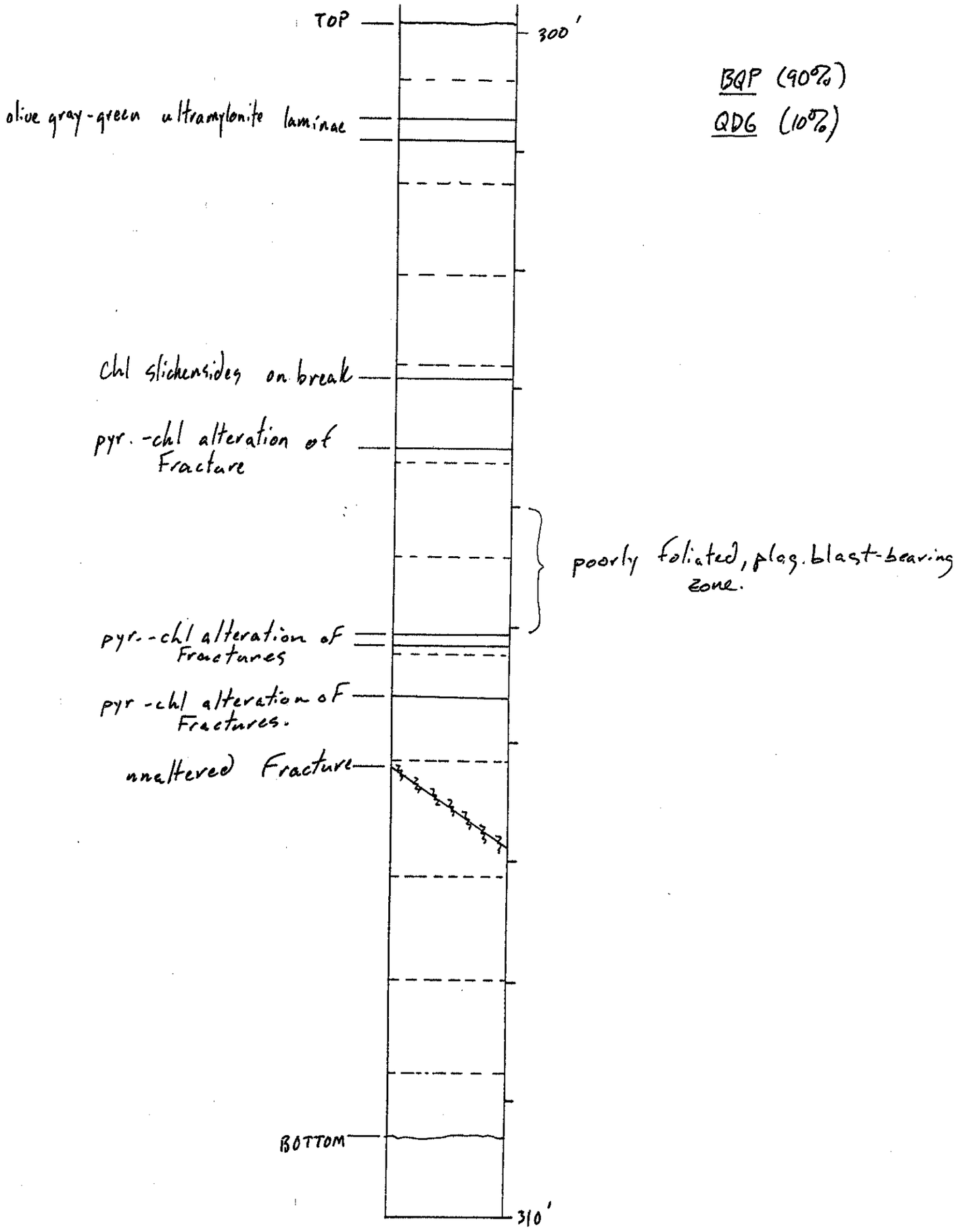
QDG (20%, .1-1 cm. thick layers.)

Scattered plag. blasts .5-1.3 cm. in diam.

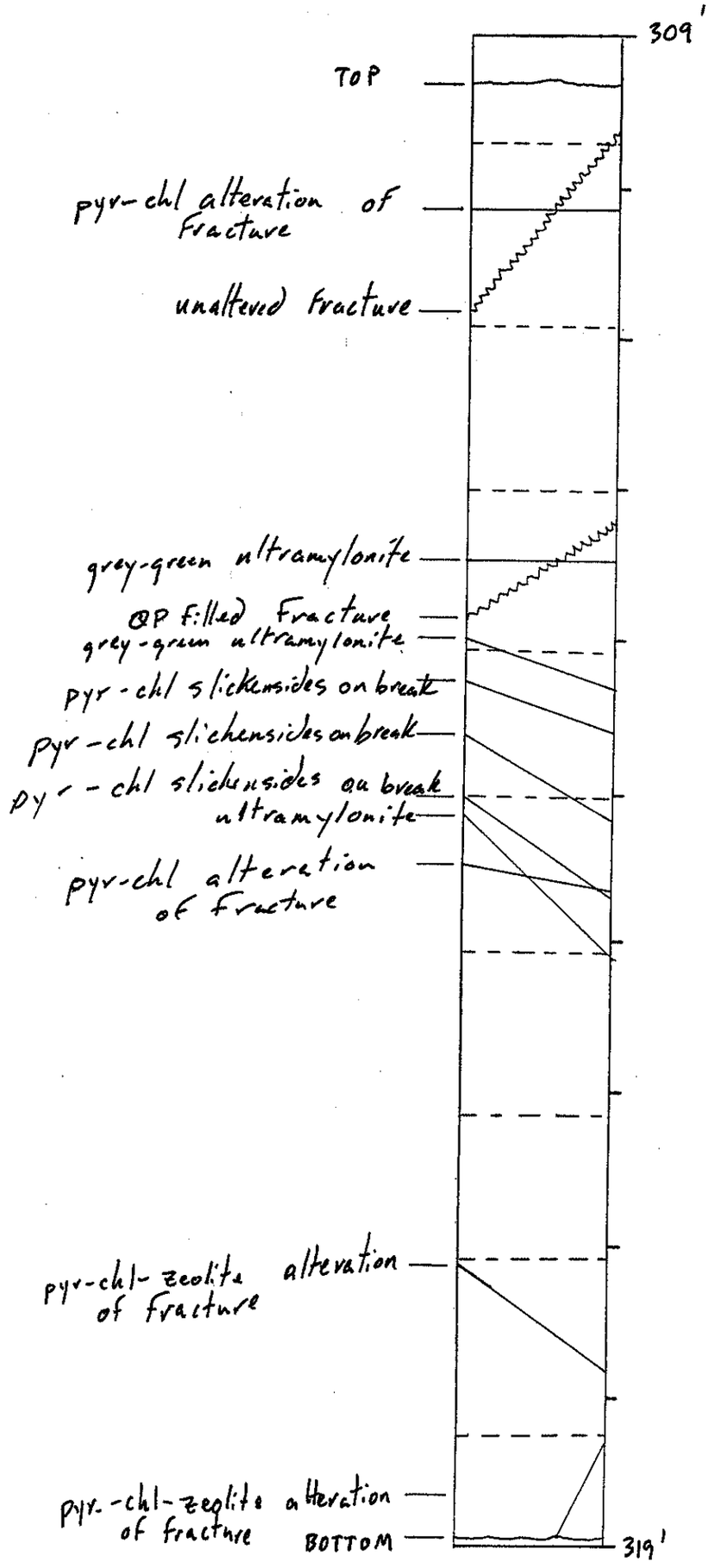
tr. grt in QDG

pyr. filled fractures common.

CORE LOG Gillette Castle BOX# 29 INTERVAL 299.9' - 309.3'



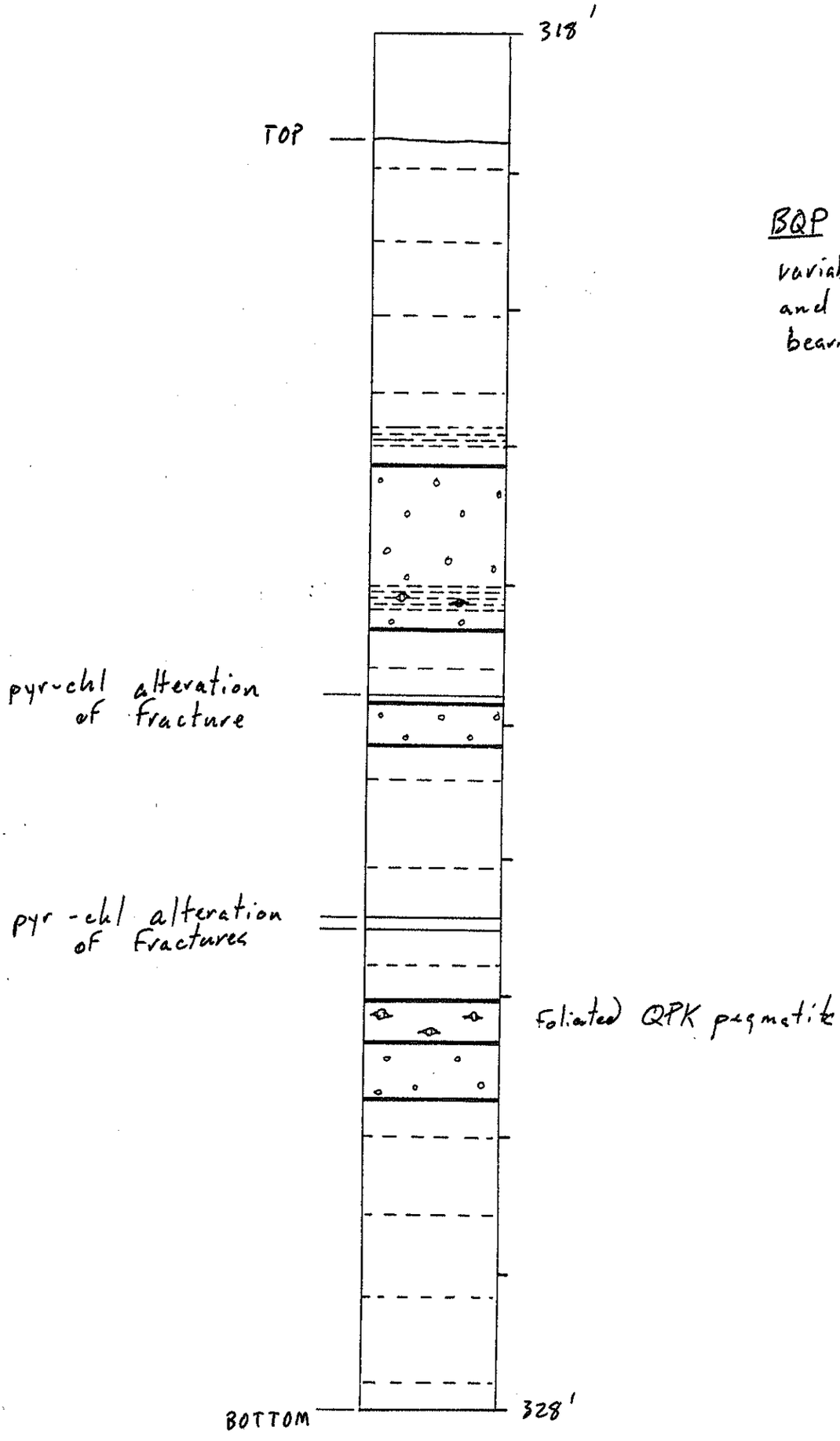
CORE LOG Gillette Castle BOX# 30 INTERVAL 309.3' - 318.8'



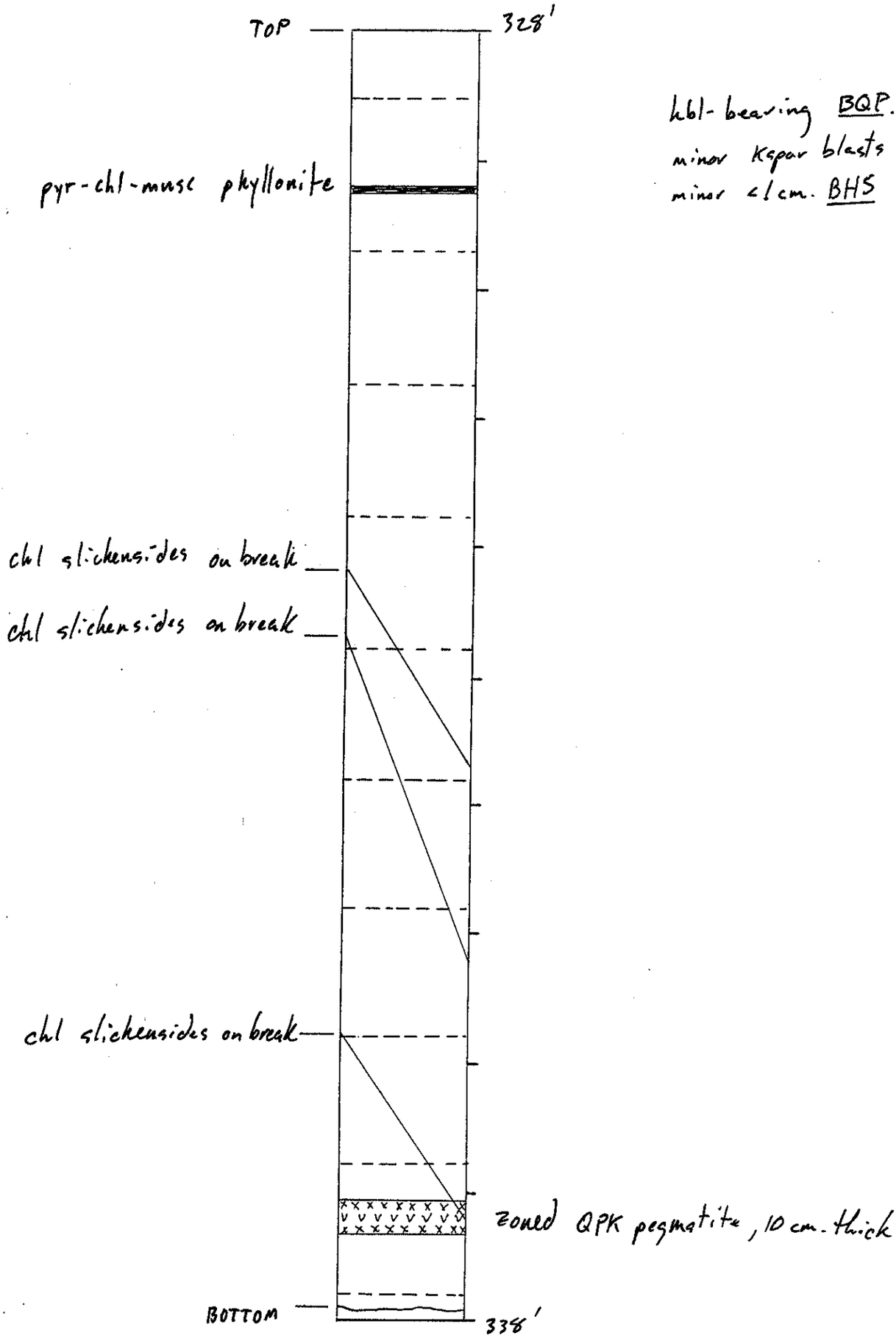
BQP (70%)

QDG (30%, .3-1 cm. thick layers)

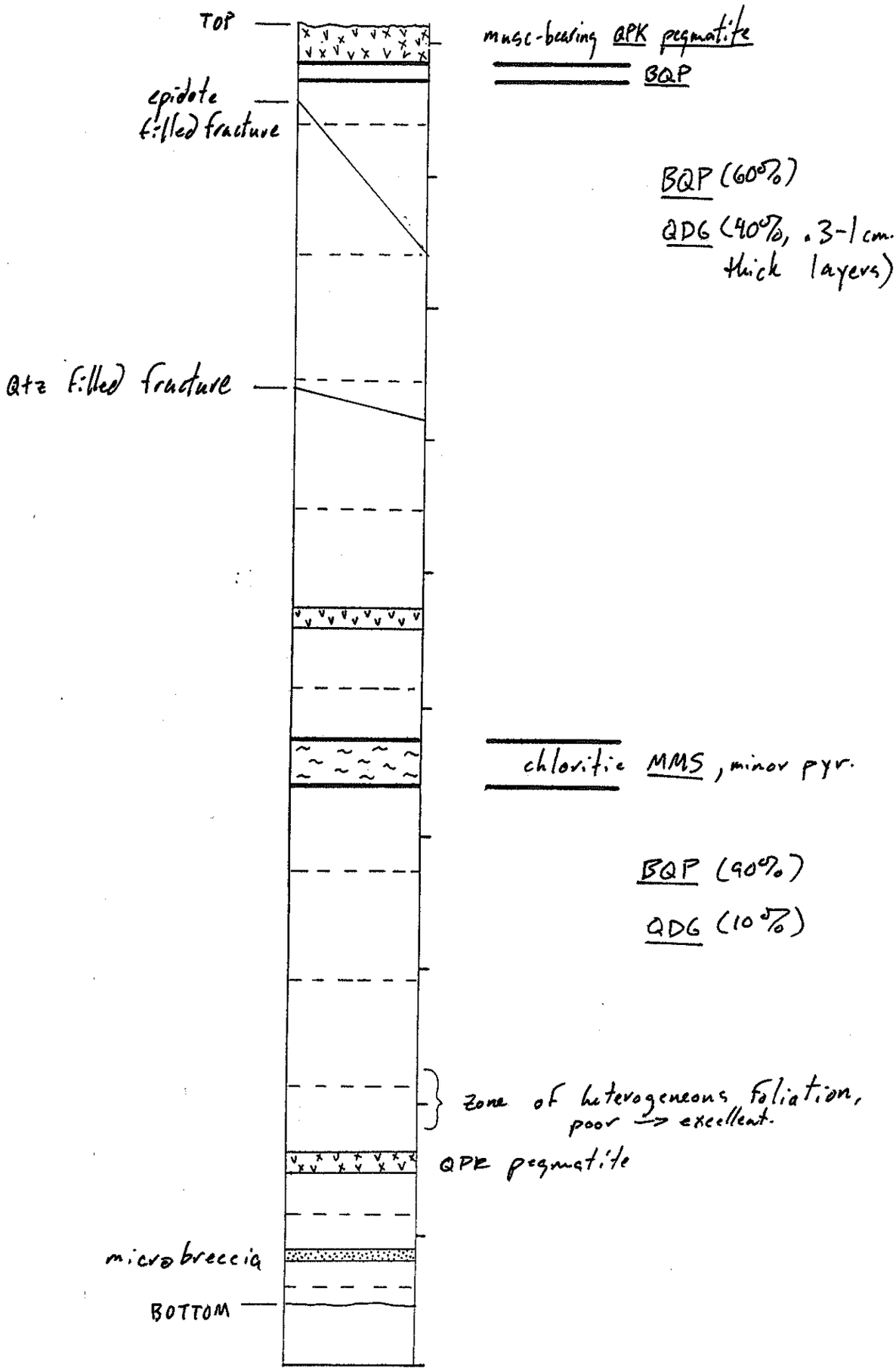
CORE LOG Gillette Castle BOX# 31 INTERVAL 318.8' - 328.0'



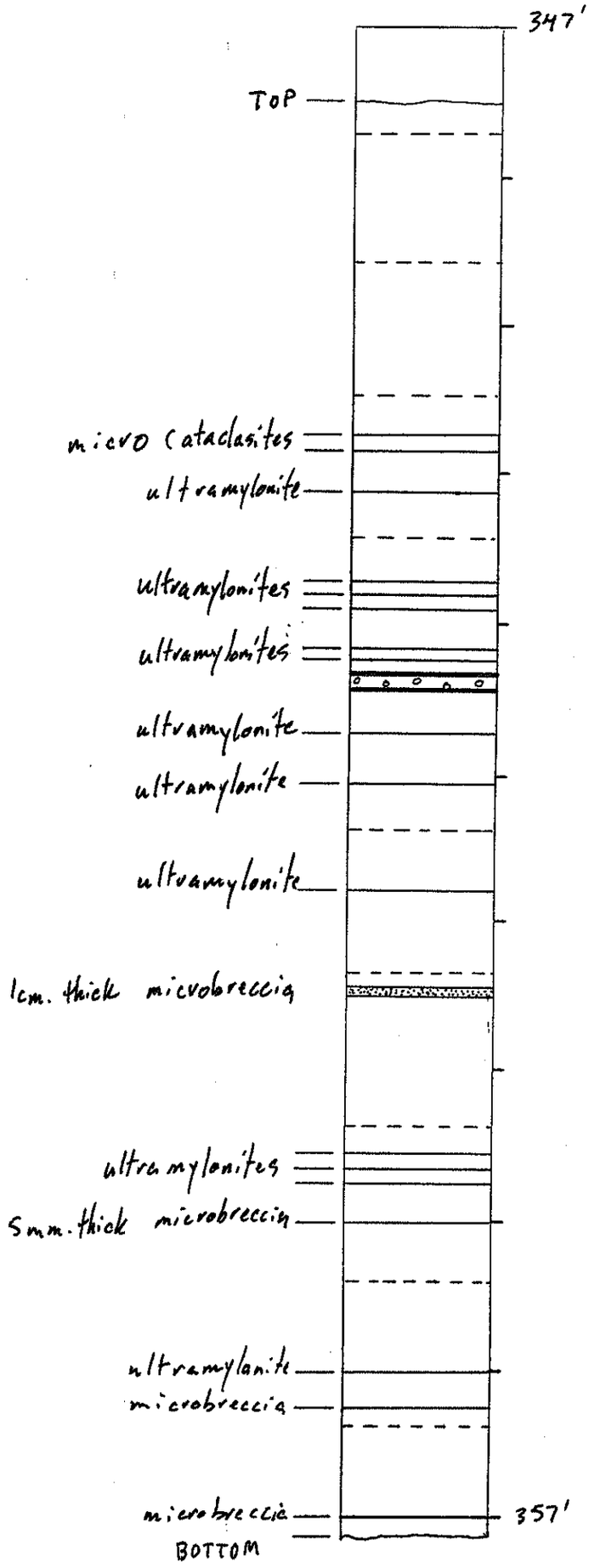
CORE LOG Gillette Castle BOX# 32 INTERVAL 328.0' - 338.0'



CORE LOG Gillette Castle BOX# 33 INTERVAL 338.0'-347.4'

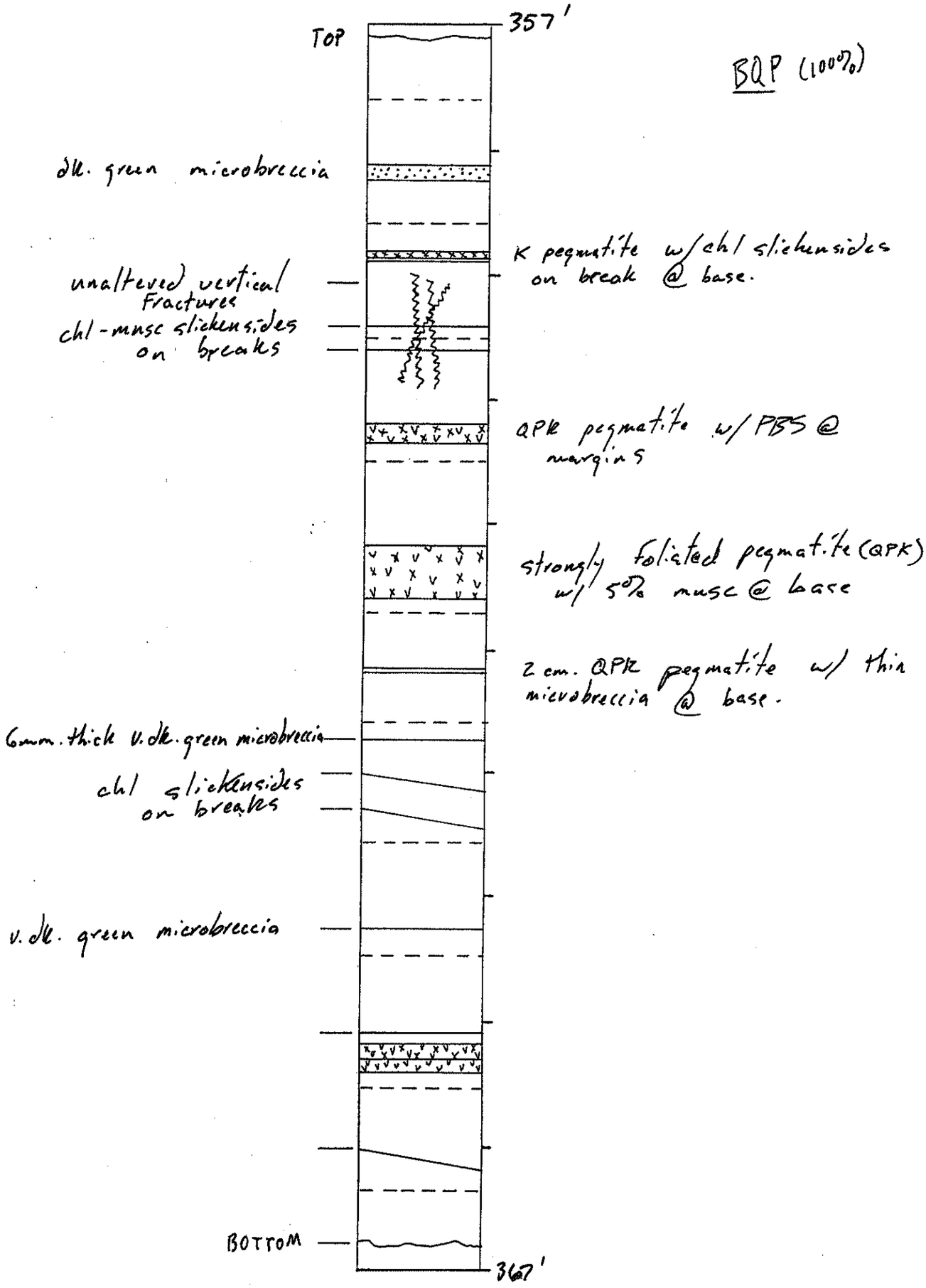


CORE LOG Gillette Castle BOX# 34 INTERVAL 347.4' - 357.2'

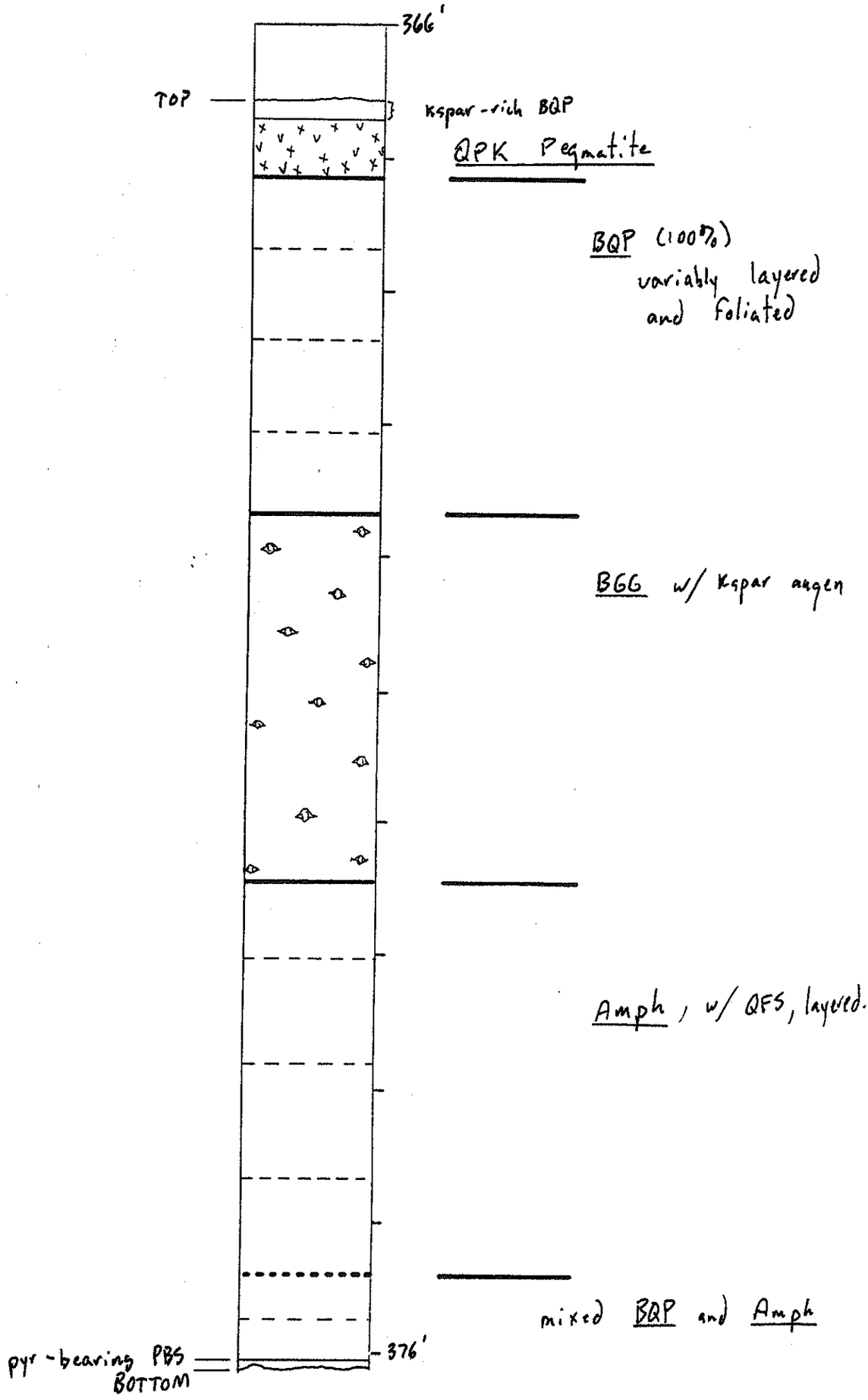


BQP, variably foliated and plag. blast-bearing. Generally well layered above spotted zone @ 351'5" and variably layered and foliated below.

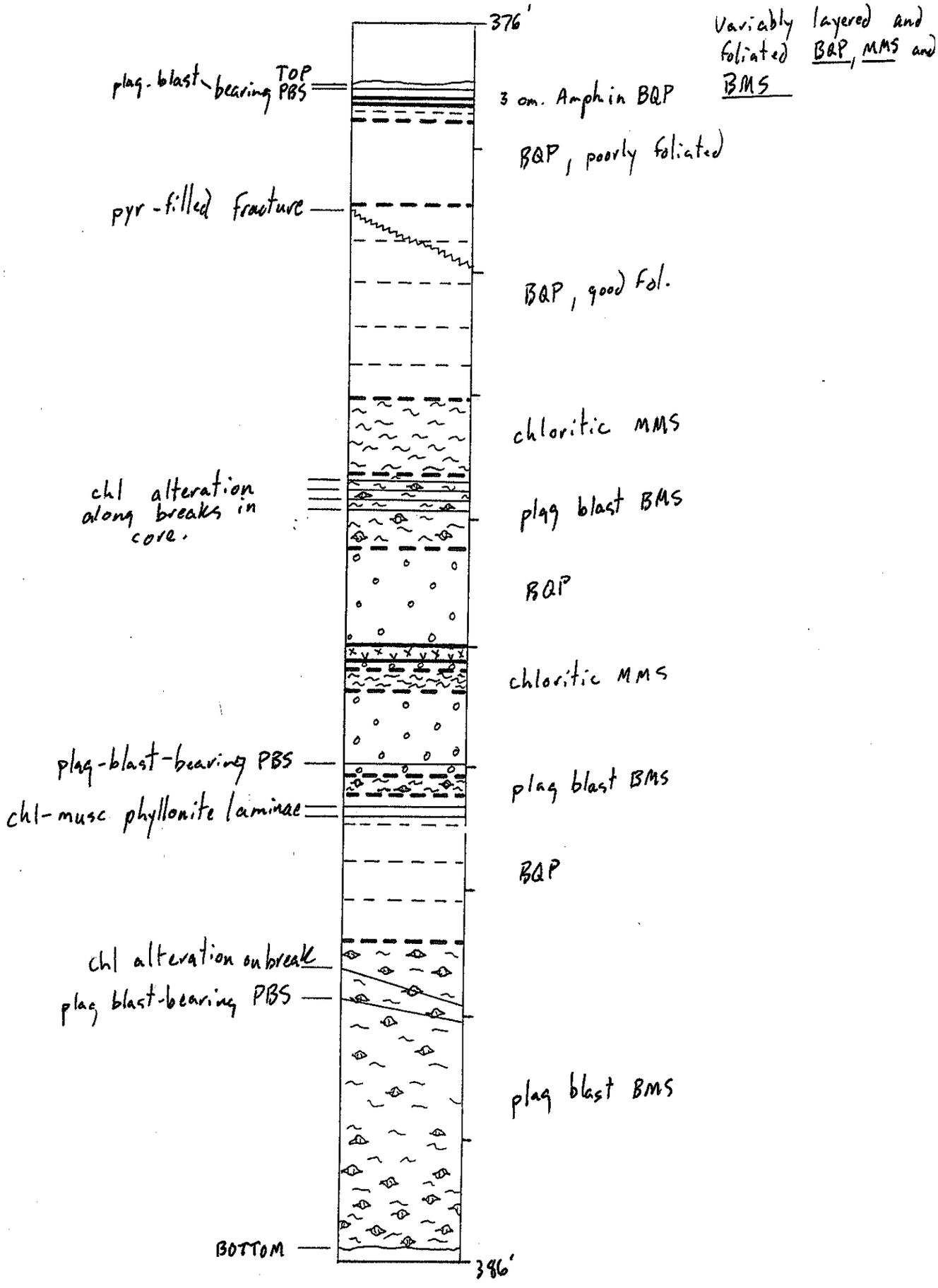
CORE LOG Gillette Castle BOX# 35 INTERVAL 357.2' - 366.7'



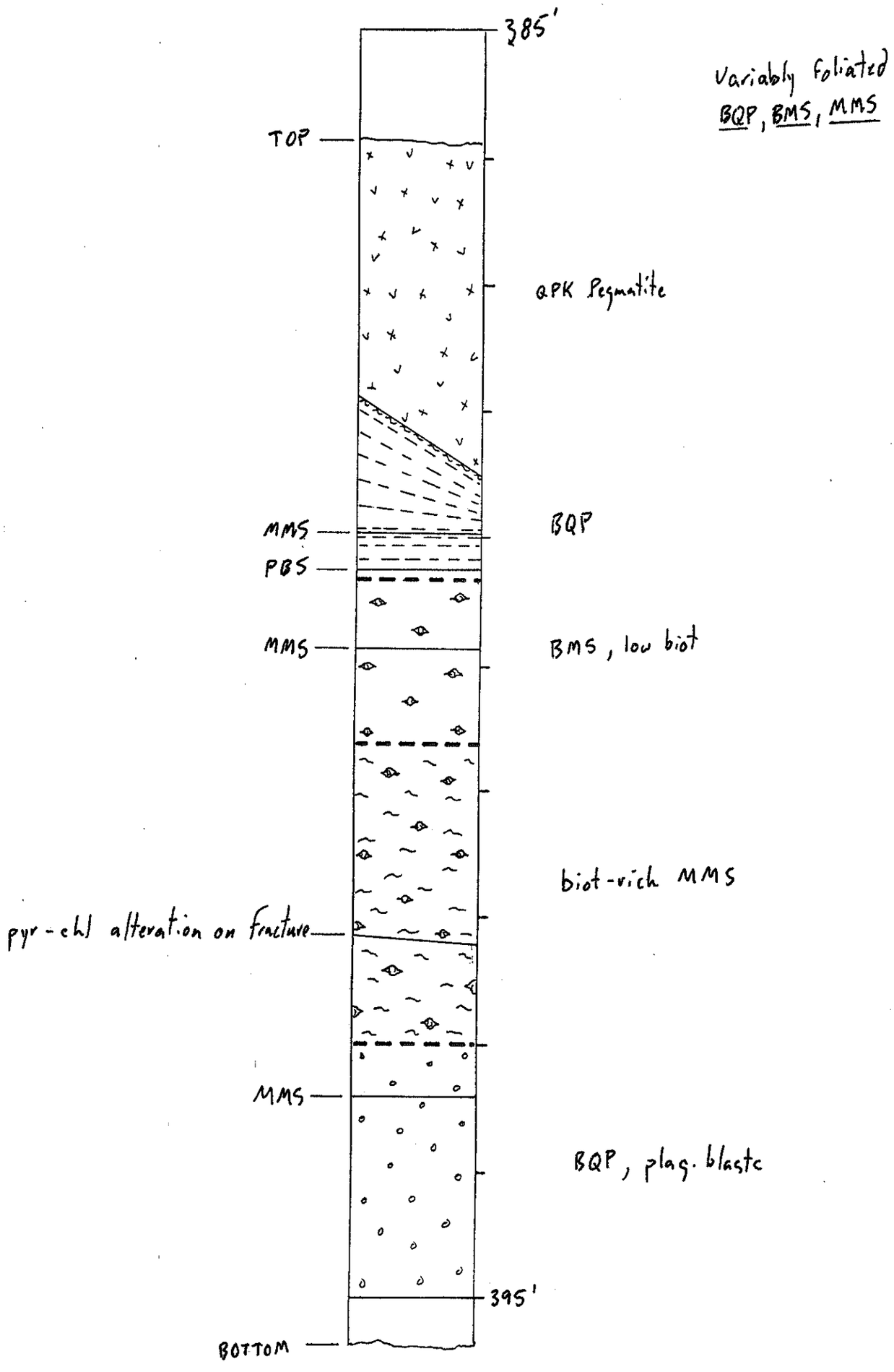
CORE LOG Gillette Castle BOX# 36 INTERVAL 366.7'-376.5'



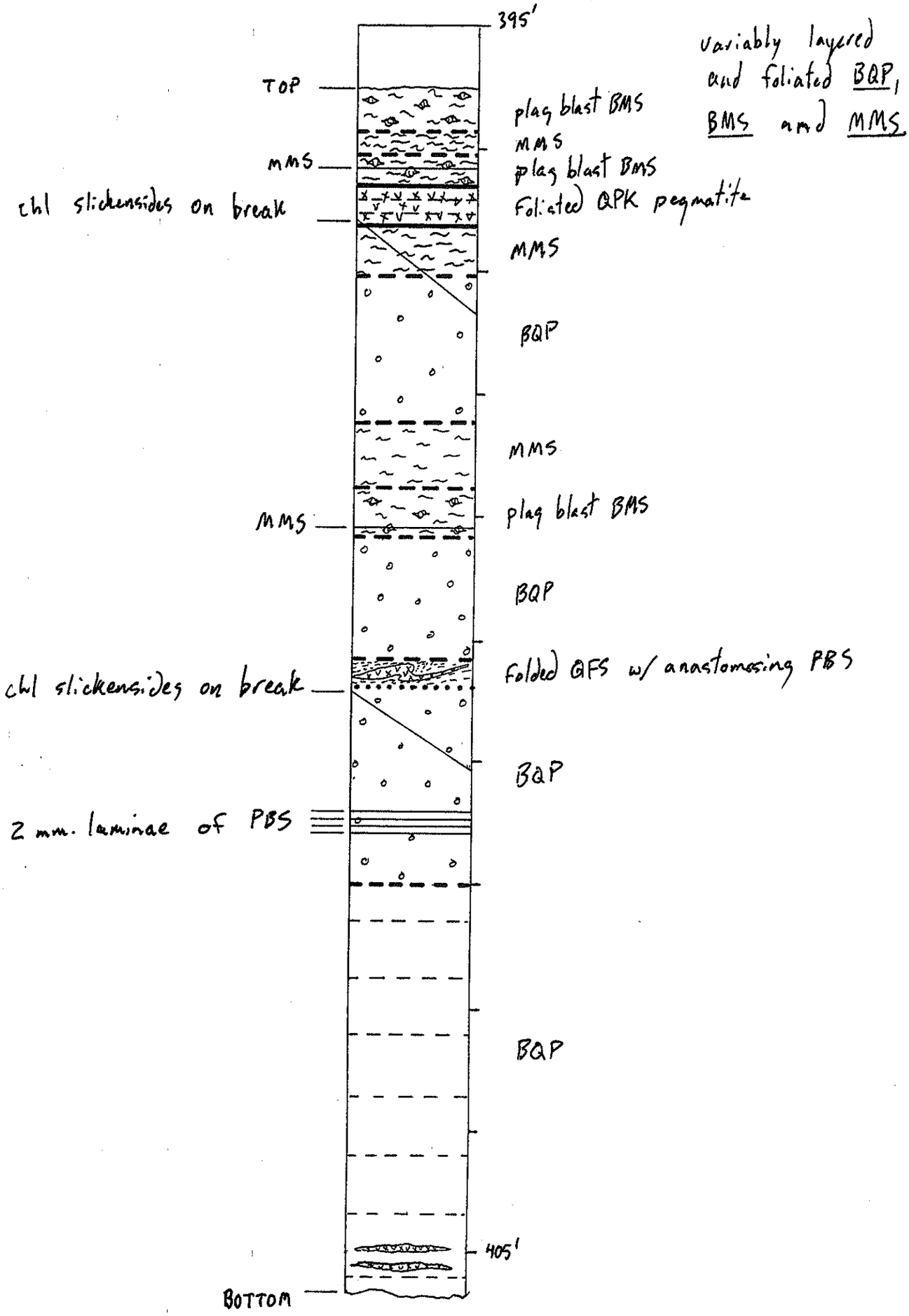
CORE LOG Billette Castle BOX# 37 INTERVAL 376.5'- 385.9'



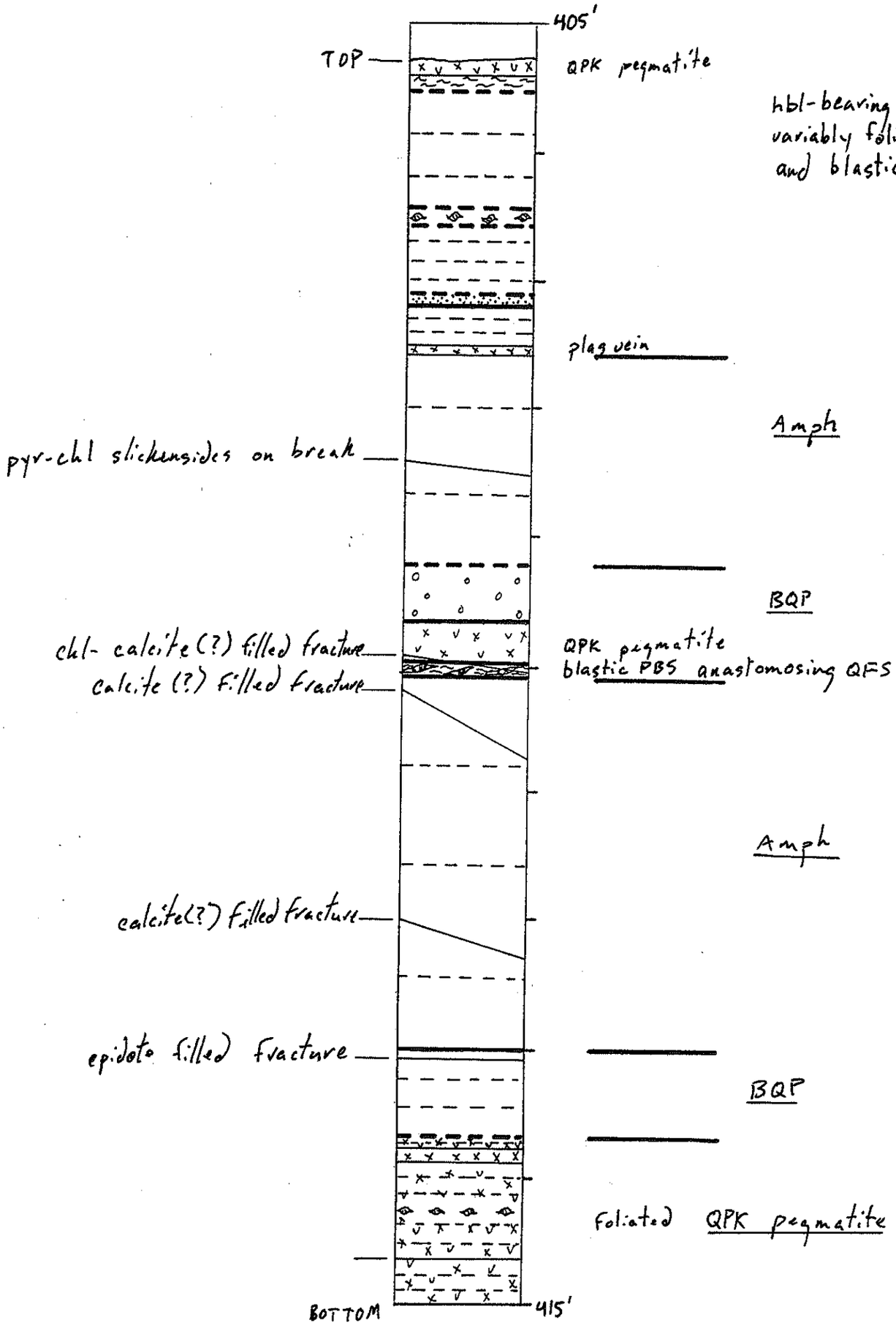
CORE LOG Gillette Castle BOX# 38 INTERVAL 385.9'-395.5'



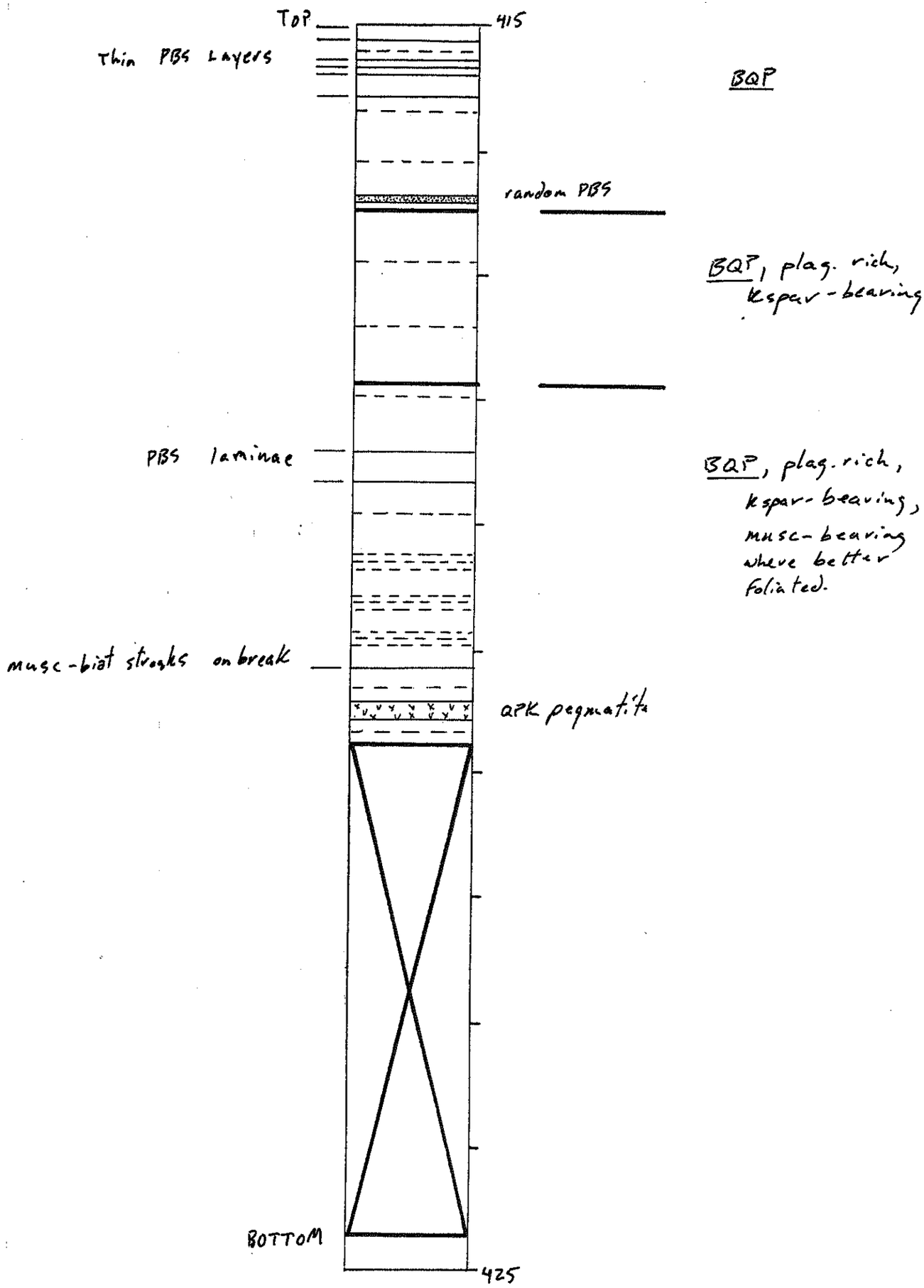
CORE LOG Gillette Castle BOX# 39 INTERVAL 395.5' - 405.3'



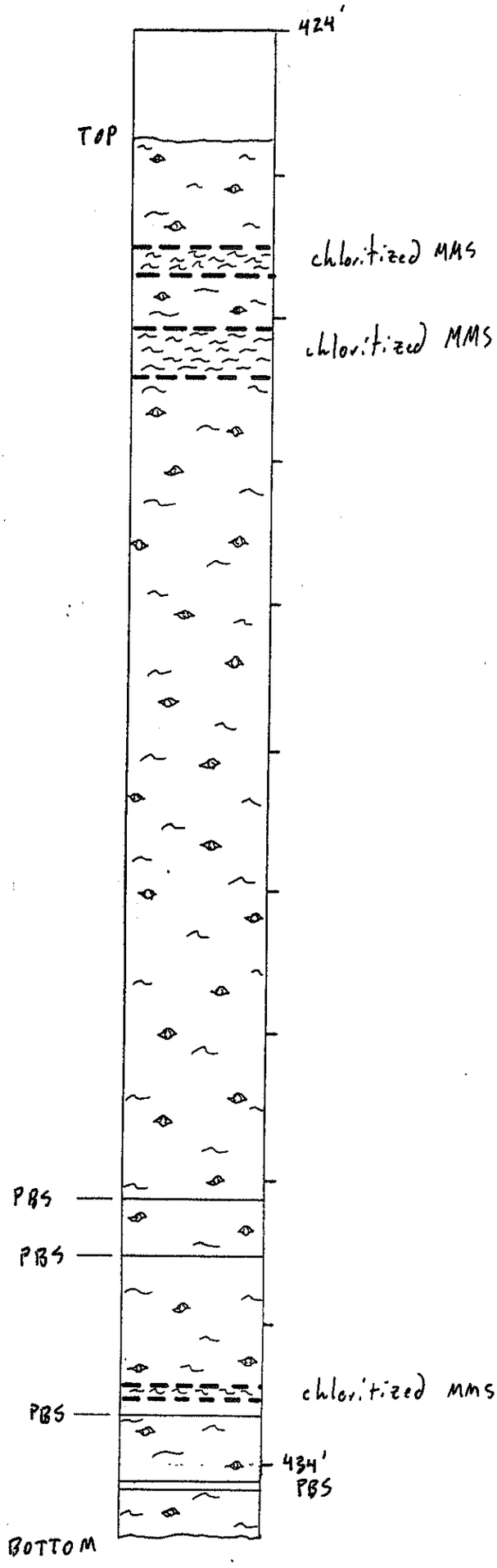
CORE LOG Gillette Castle BOX# 40 INTERVAL 405.3' - 415.0'



CORE LOG Gillette Castle BOX# 41 INTERVAL 415.0'-424.7'

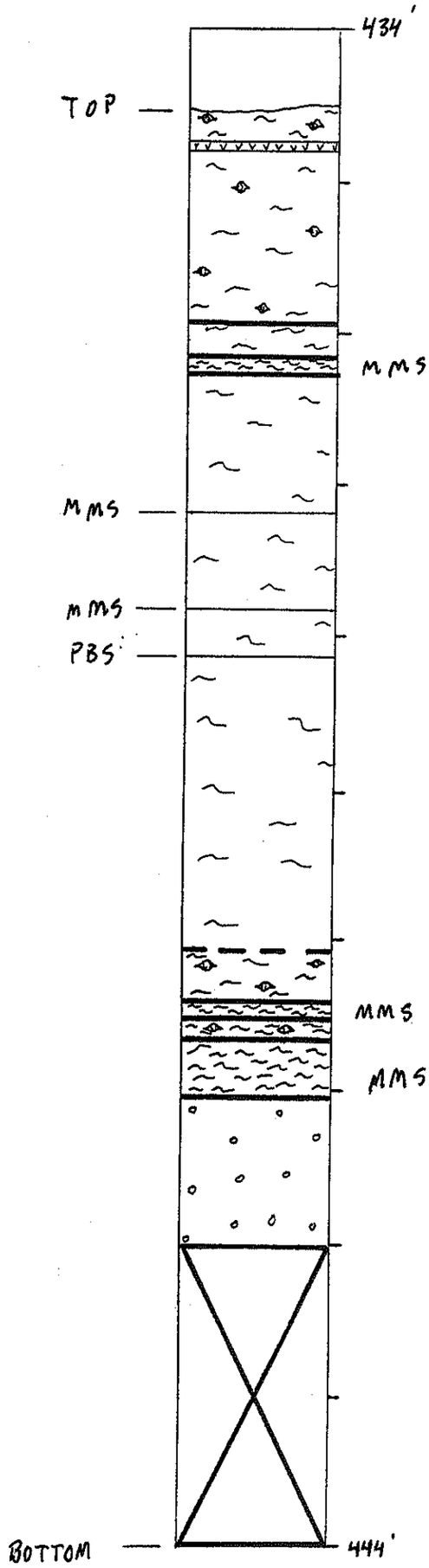


CORE LOG Gillette Castle BOX# 42 INTERVAL 424.7' - 434.5'



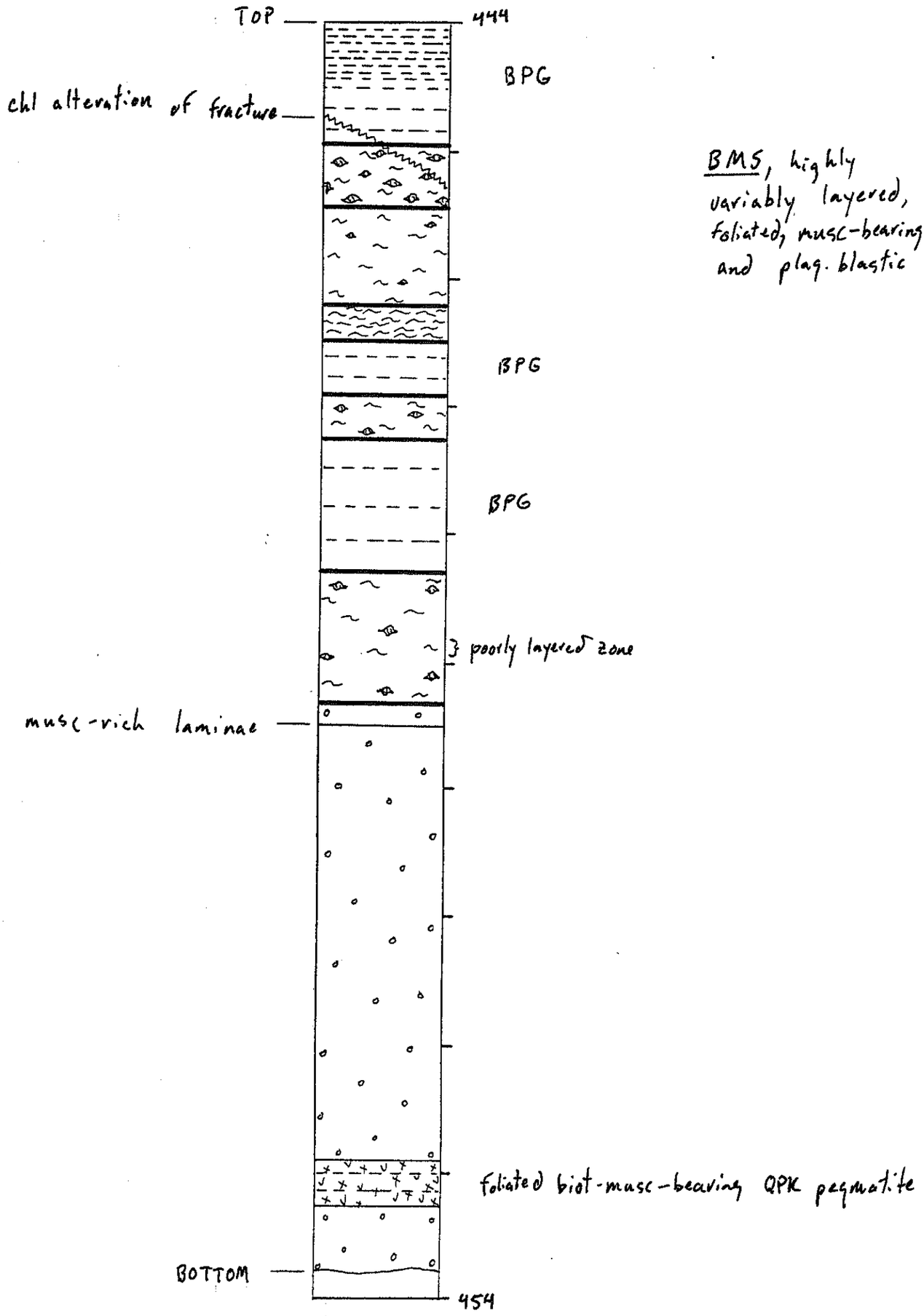
BMS, musc-rich, plag. blasts common.

CORE LOG Gillette Castle BOX# 43 INTERVAL 434.5' - 444.0'

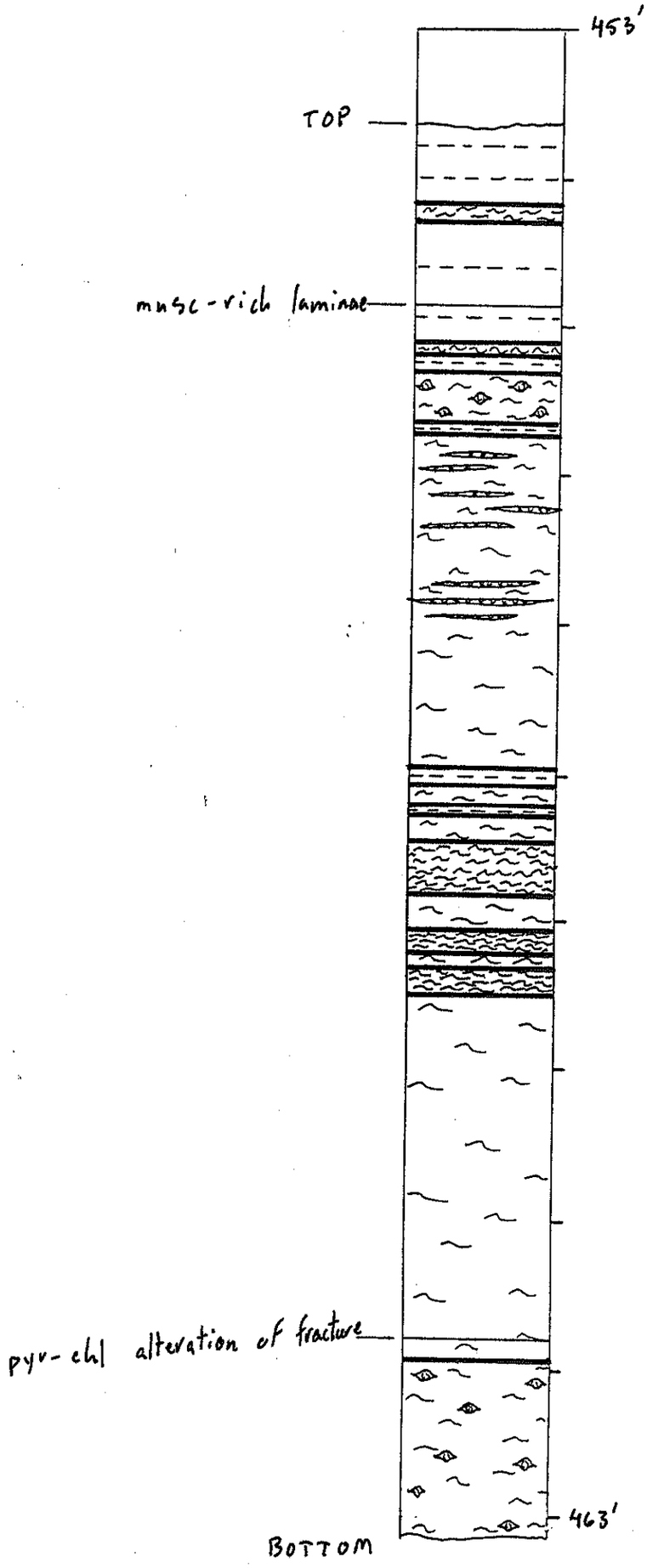


BMS, musc-rich, variably layered, foliated and plag. blastic

CORE LOG Gillette Castle BOX# 44 INTERVAL 444.0'- 453.7'

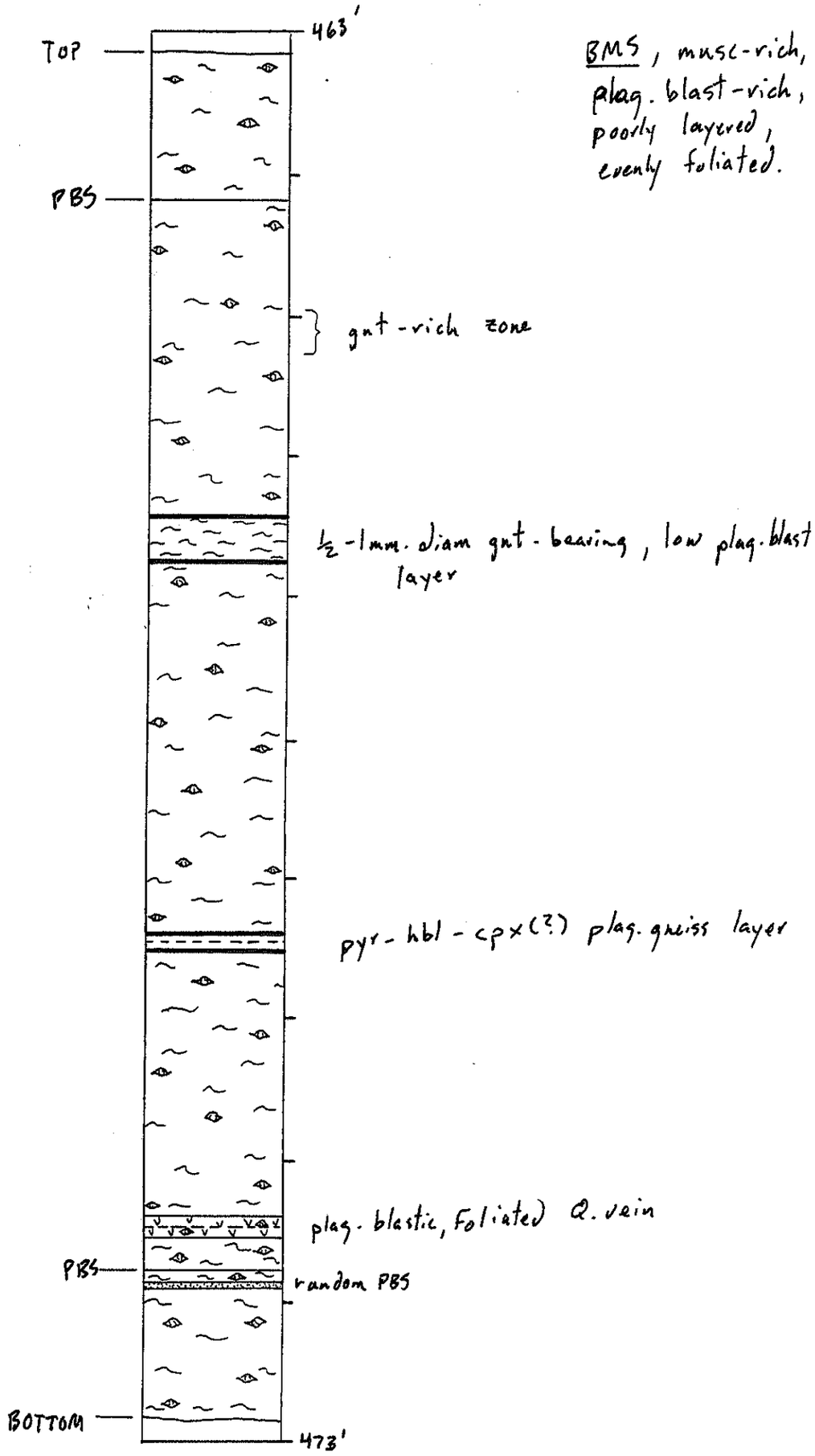


CORE LOG Gillette Castle BOX# 45 INTERVAL 453.7'-463.2'

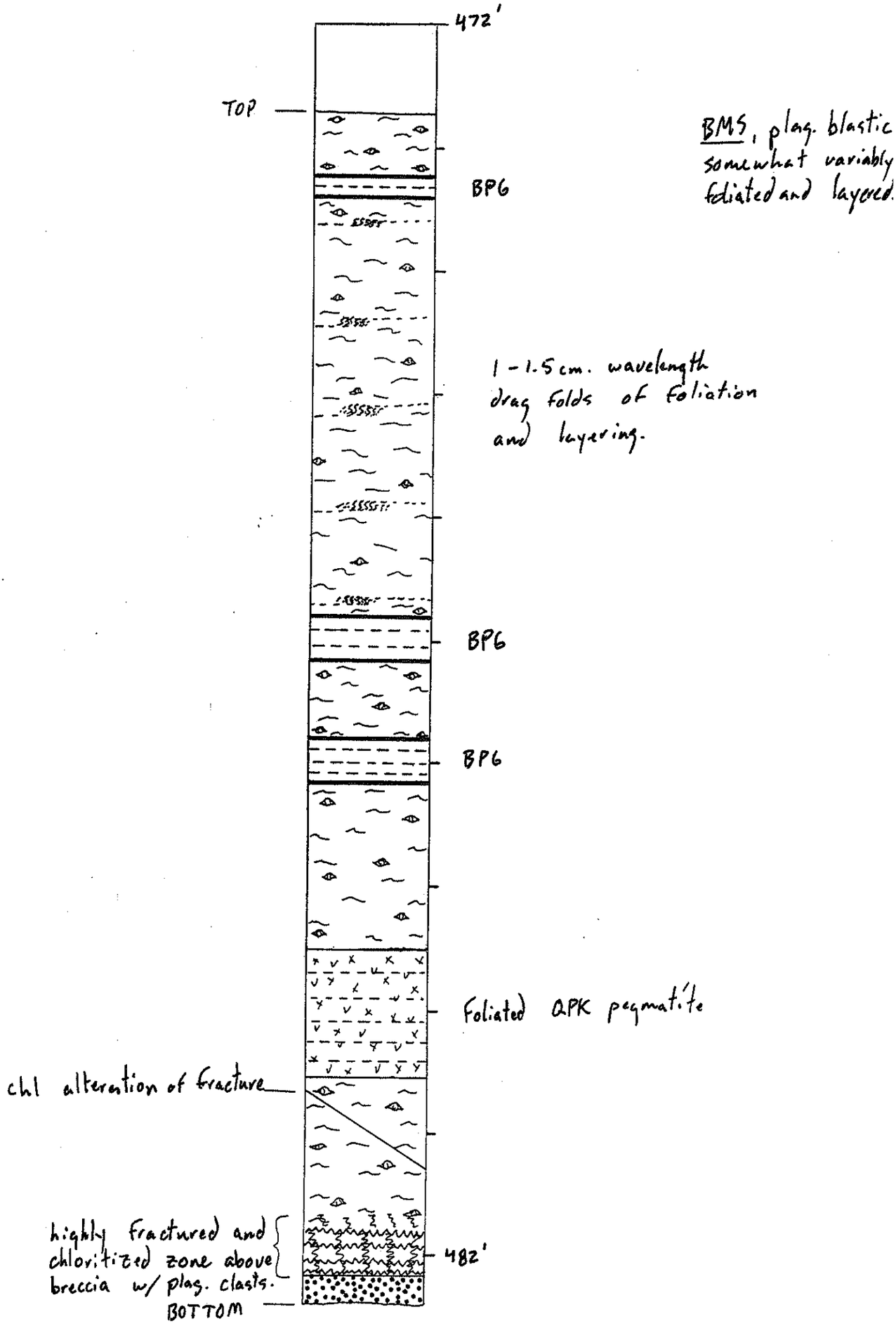


low biot BPG interlayered w/ variably foliated, layered, musc-rich, and plag. blastic BMS.

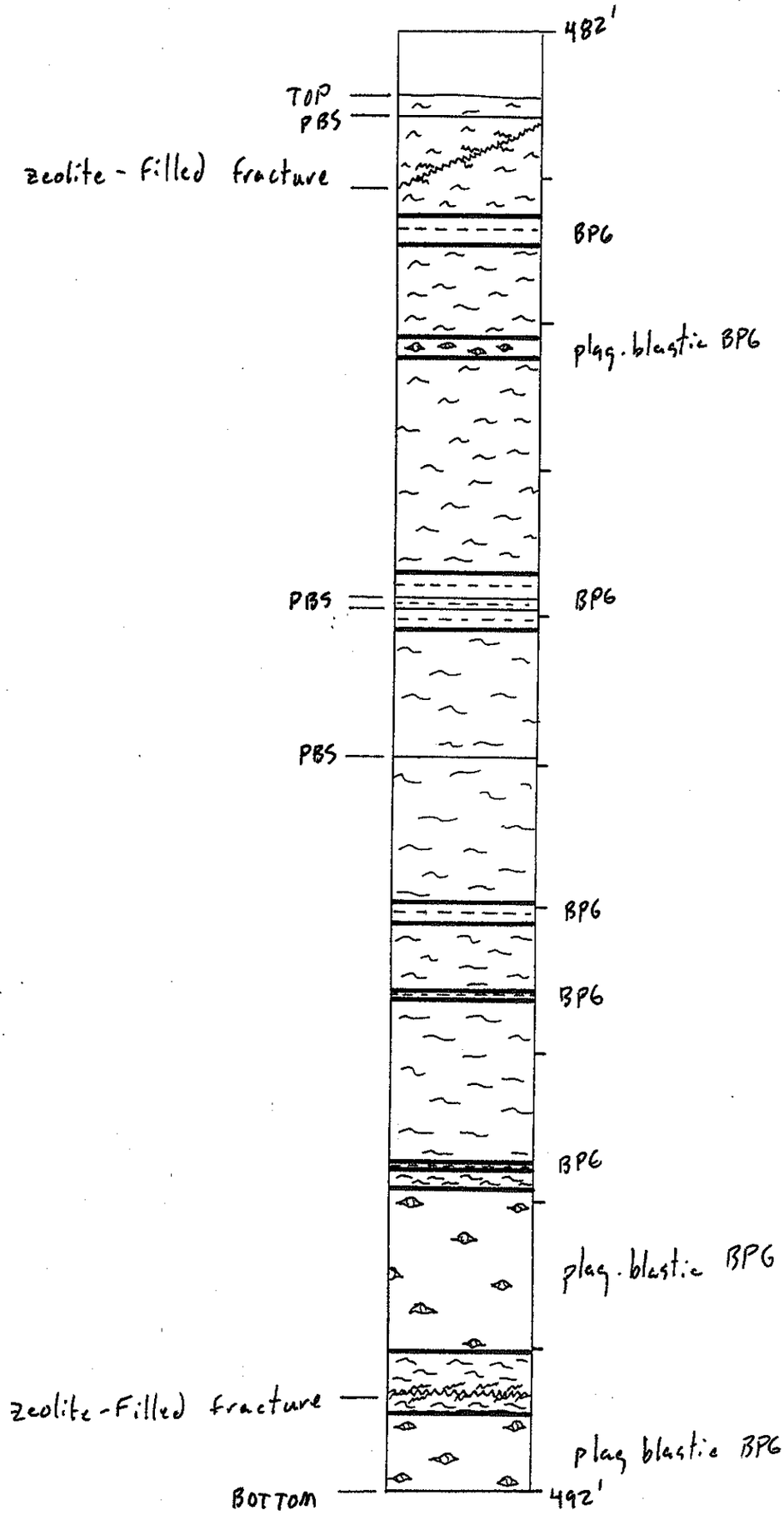
CORE LOG Gillette Castle BOX# 46 INTERVAL 463.2' - 472.8'



CORE LOG Gillette Castle BOX# 47 INTERVAL 472.8'- 482.4'

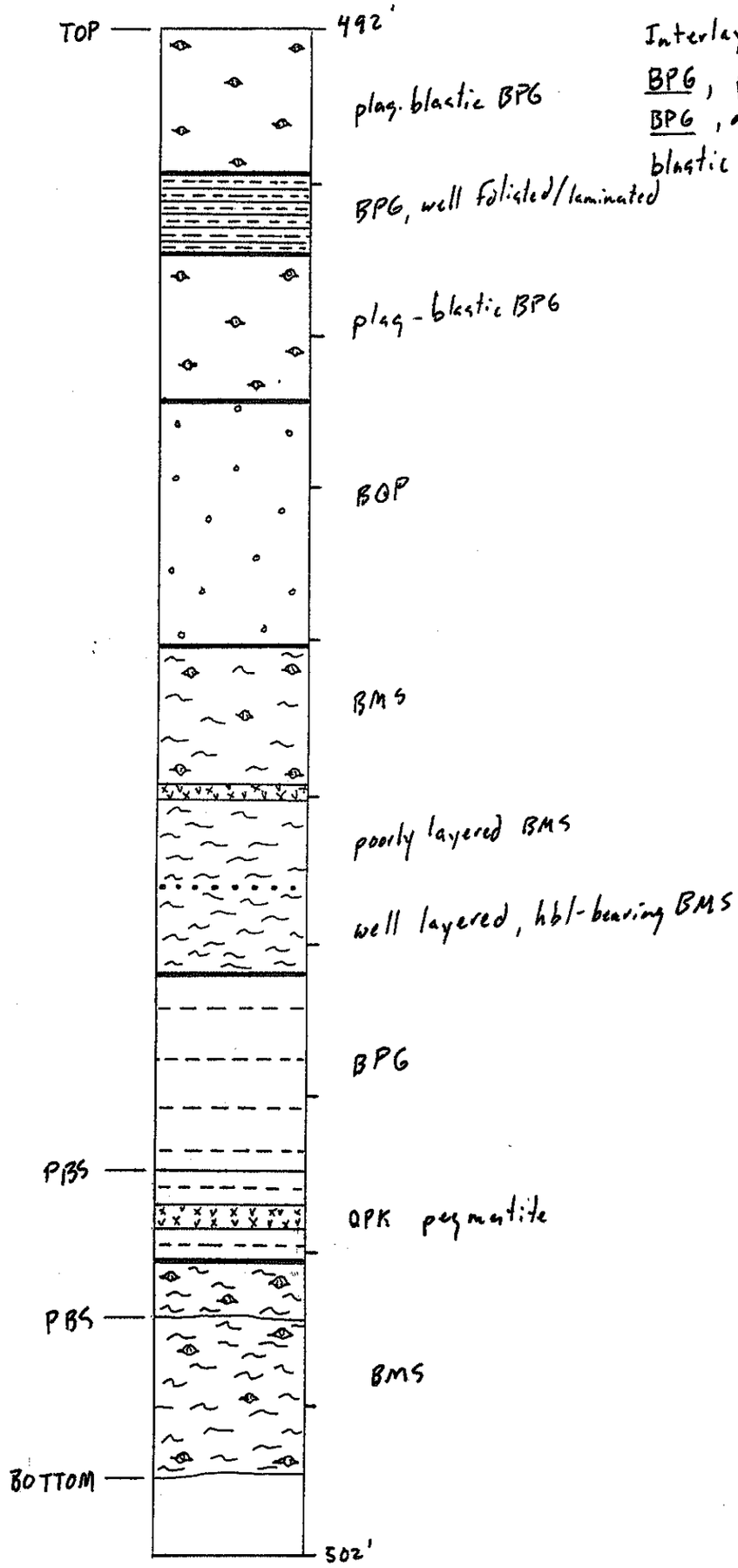


CORE LOG Gillette Castle BOX# 48 INTERVAL 482.4'-492.0'



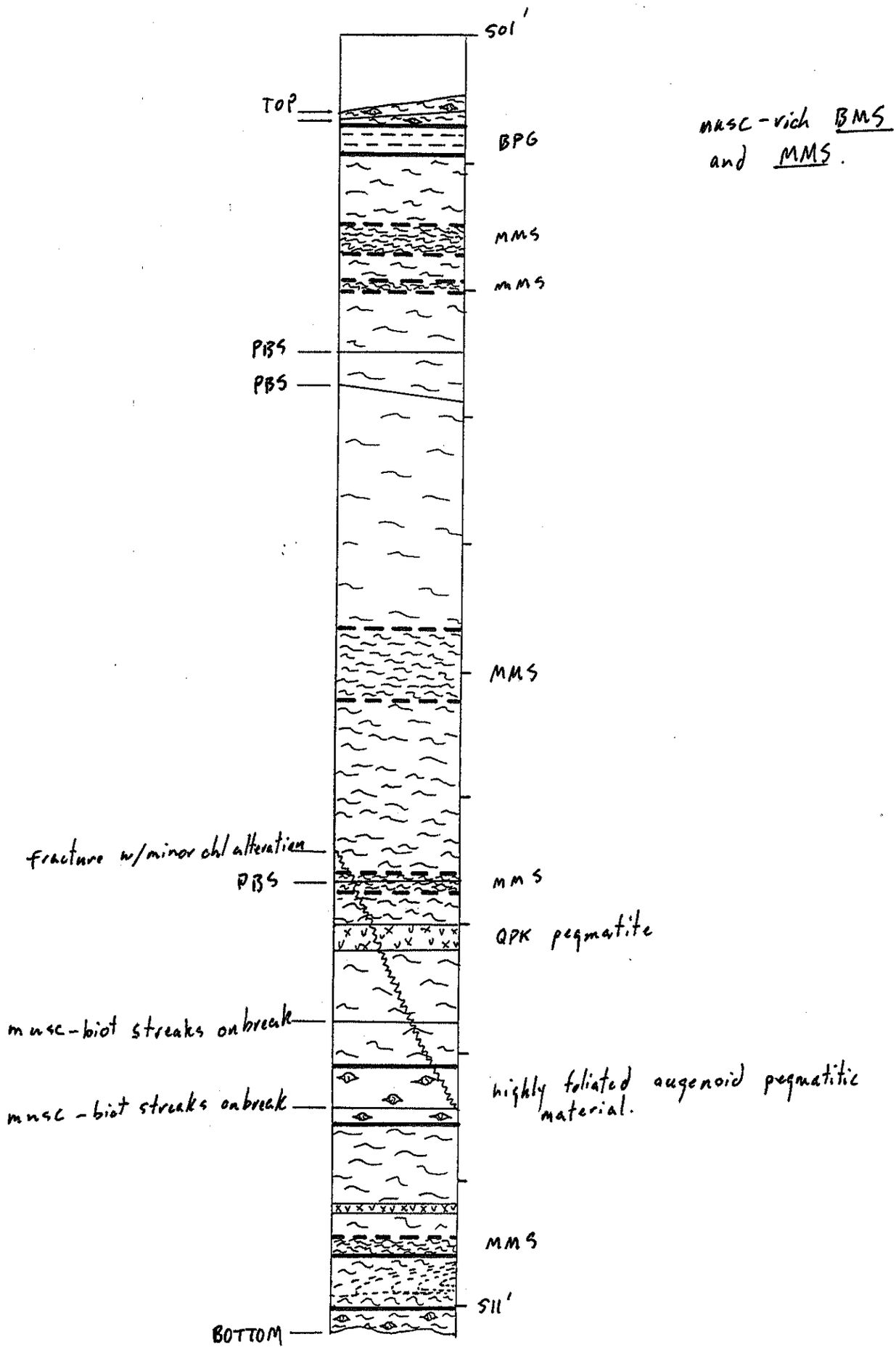
Interlayered biot-rich MMS, BPG, and plag-blastic BPG.

CORE LOG Gillette Castle BOX# 49 INTERVAL 492.0'-501.4'

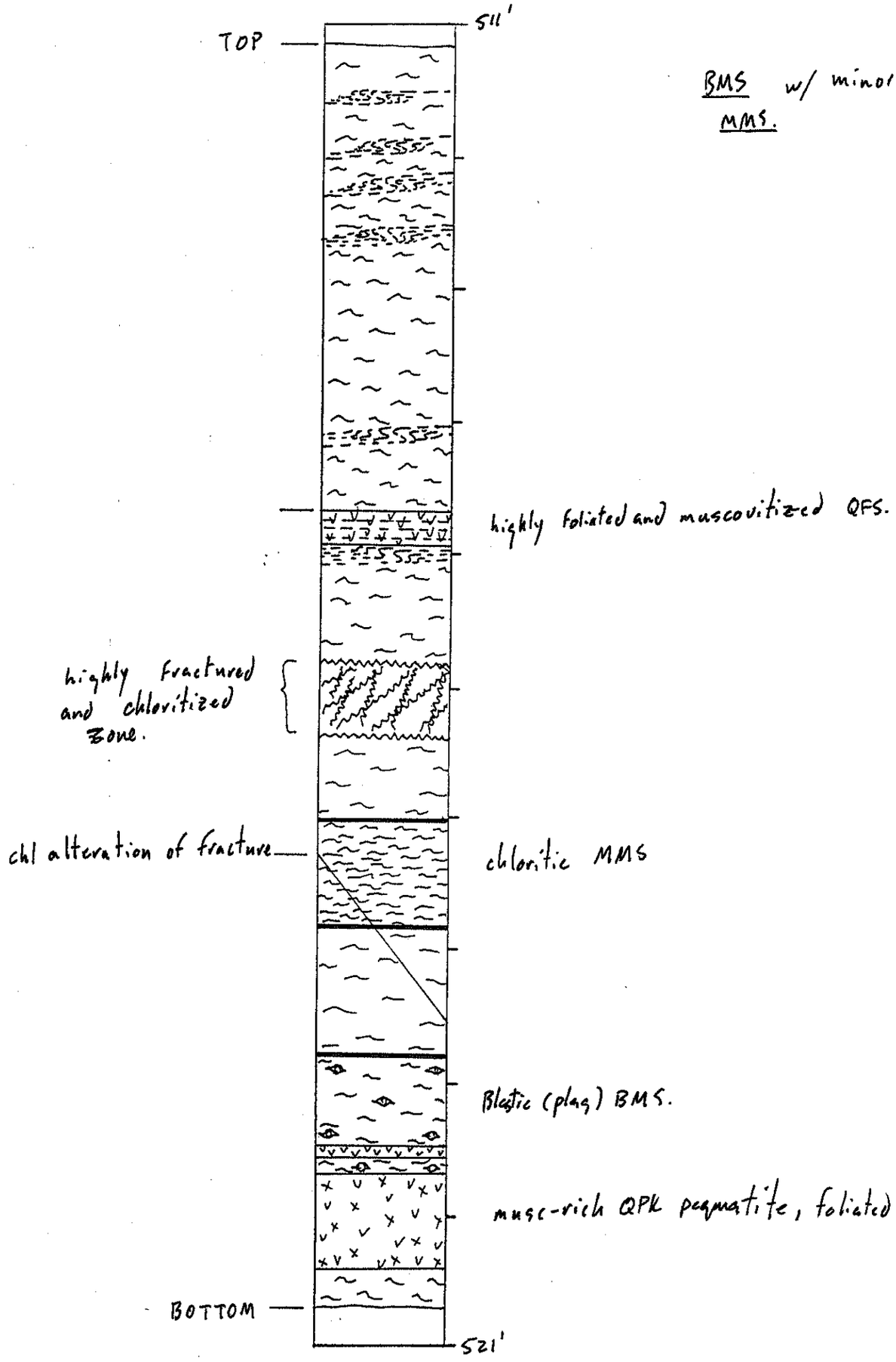


Interlayered BPG, plag. blastic BPG, and variably blastic BMS.

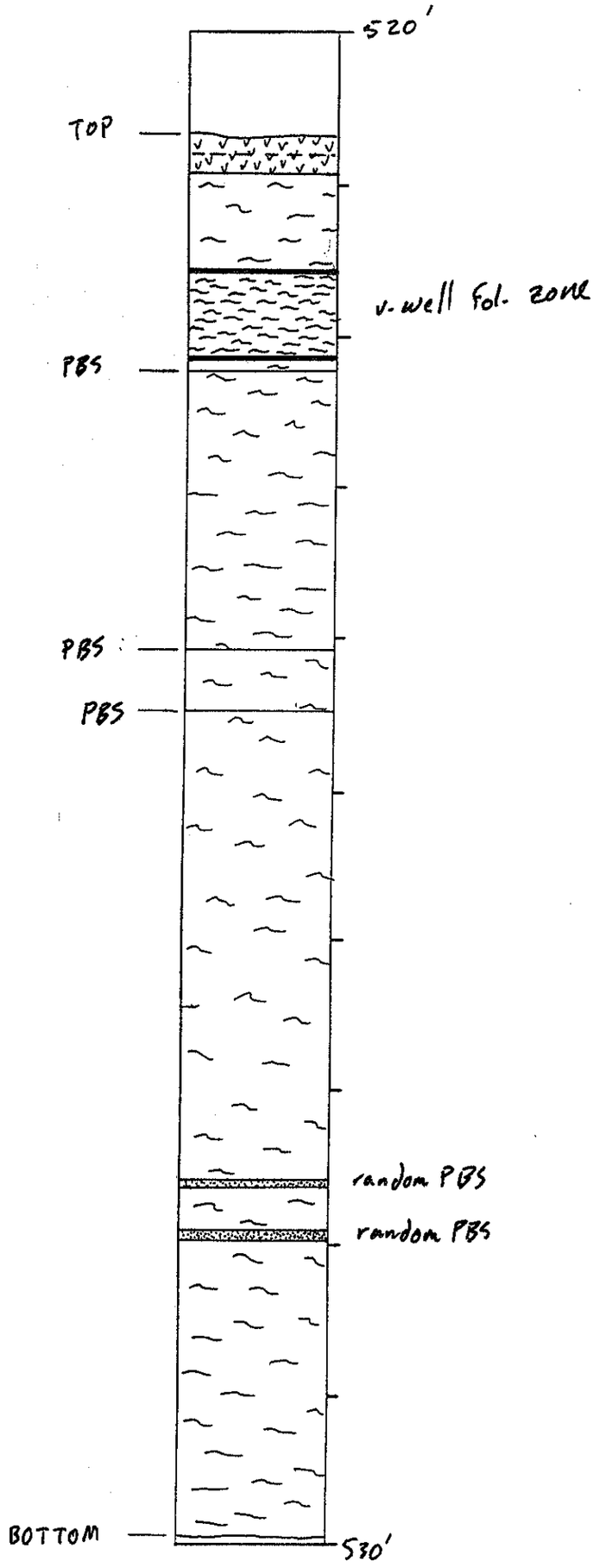
CORE LOG Gillette Castle BOX# 50 INTERVAL 501.4' - 511.2'



CORE LOG Gillette Castle BOX# 51 INTERVAL 511.2'-520.7'

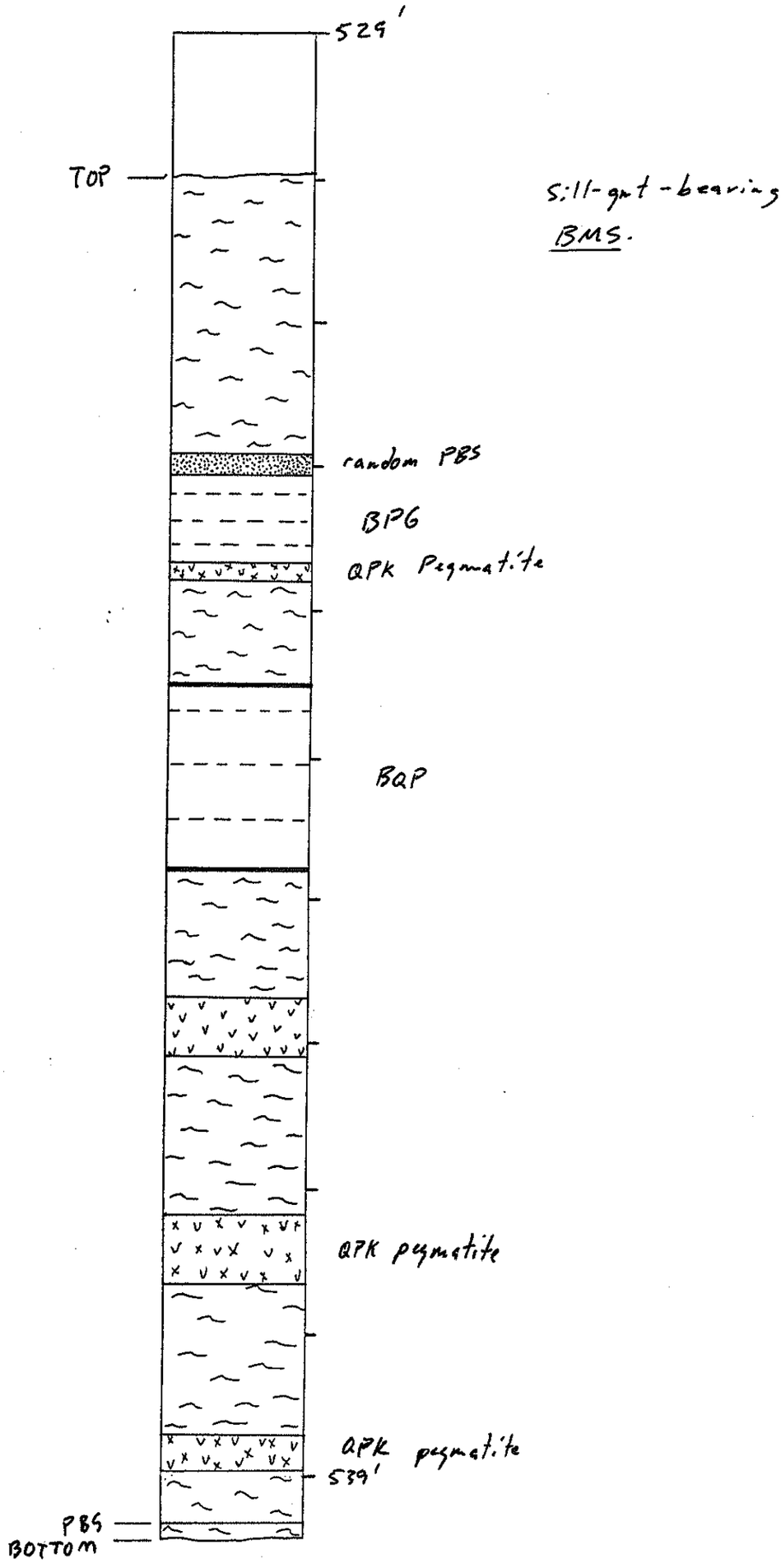


CORE LOG Gillette Castle BOX# 52 INTERVAL 520.7'-529.9'

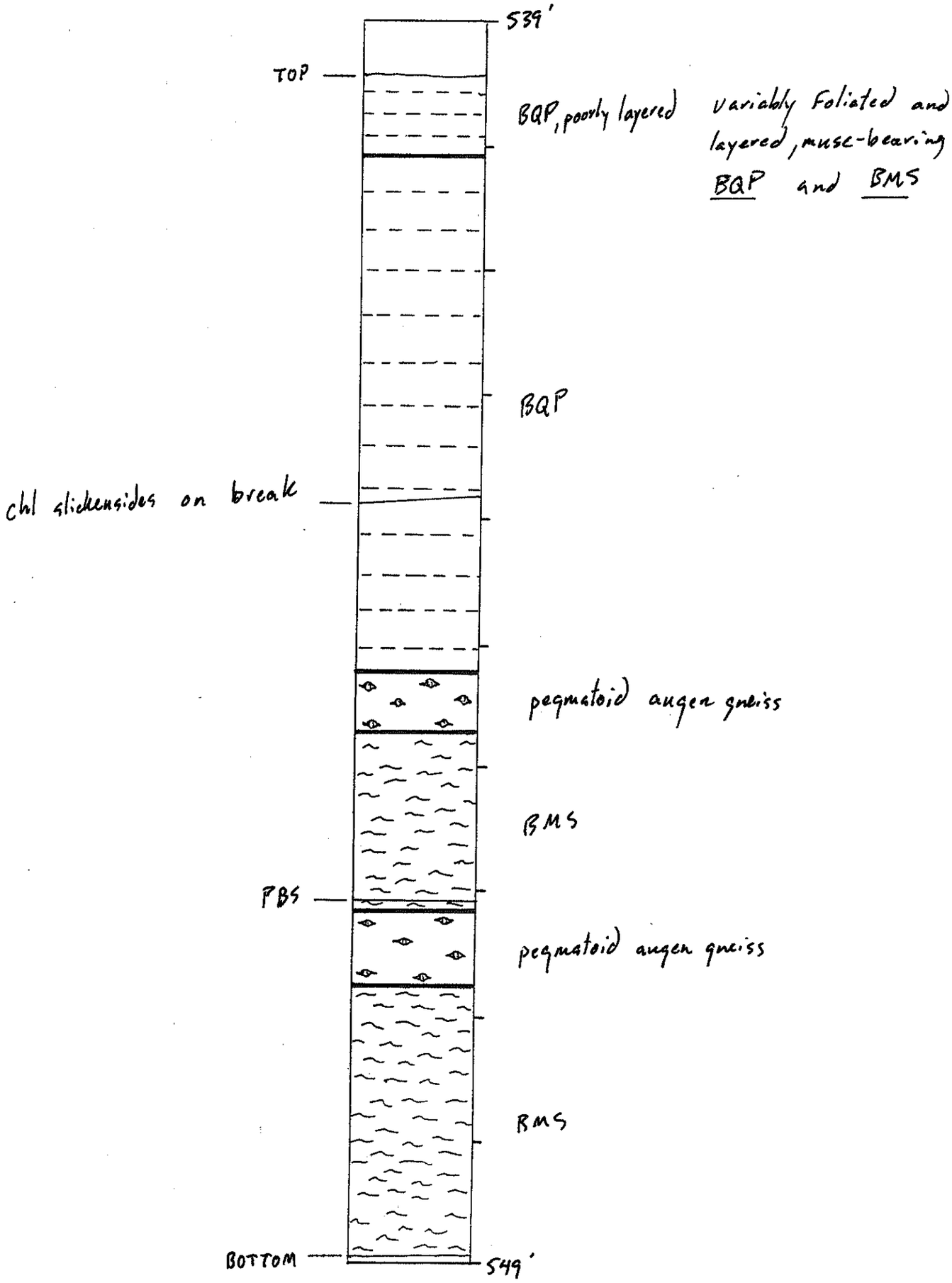


sill-qxt-bearing BMS.

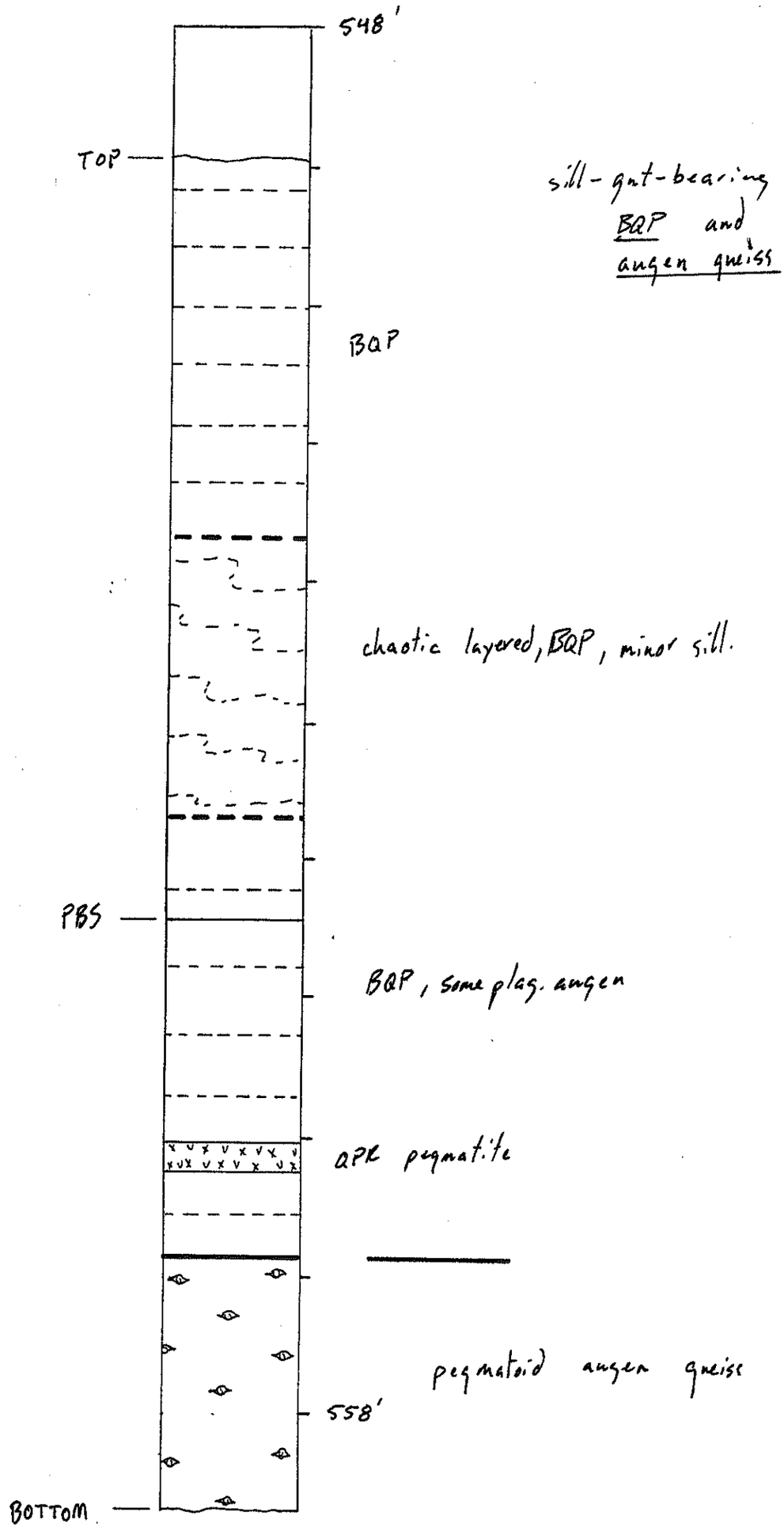
CORE LOG Gillette Castle BOX# 53 INTERVAL 529.9'-539.4'



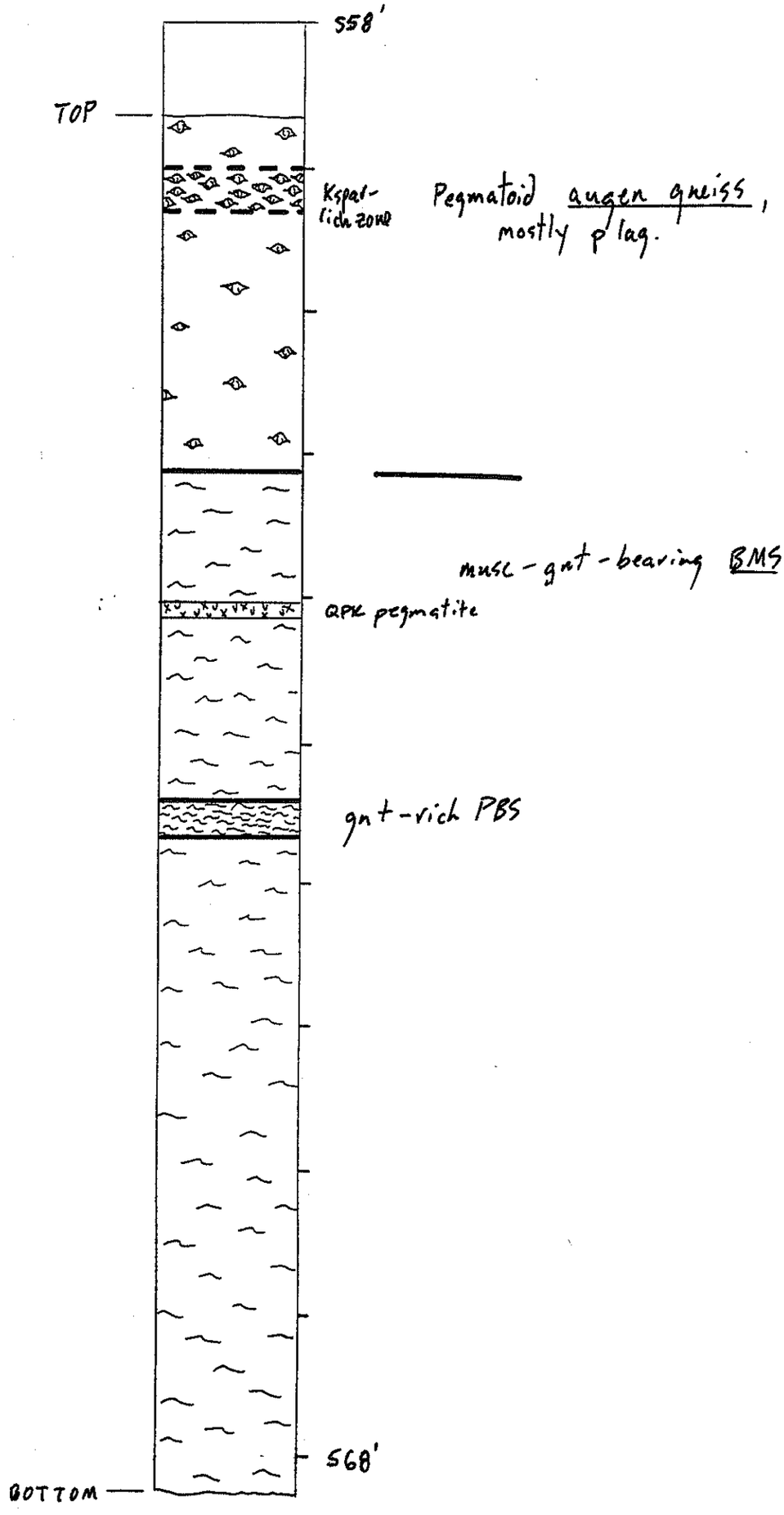
CORE LOG Gillette Castle BOX# 54 INTERVAL 539.4'-548.9'



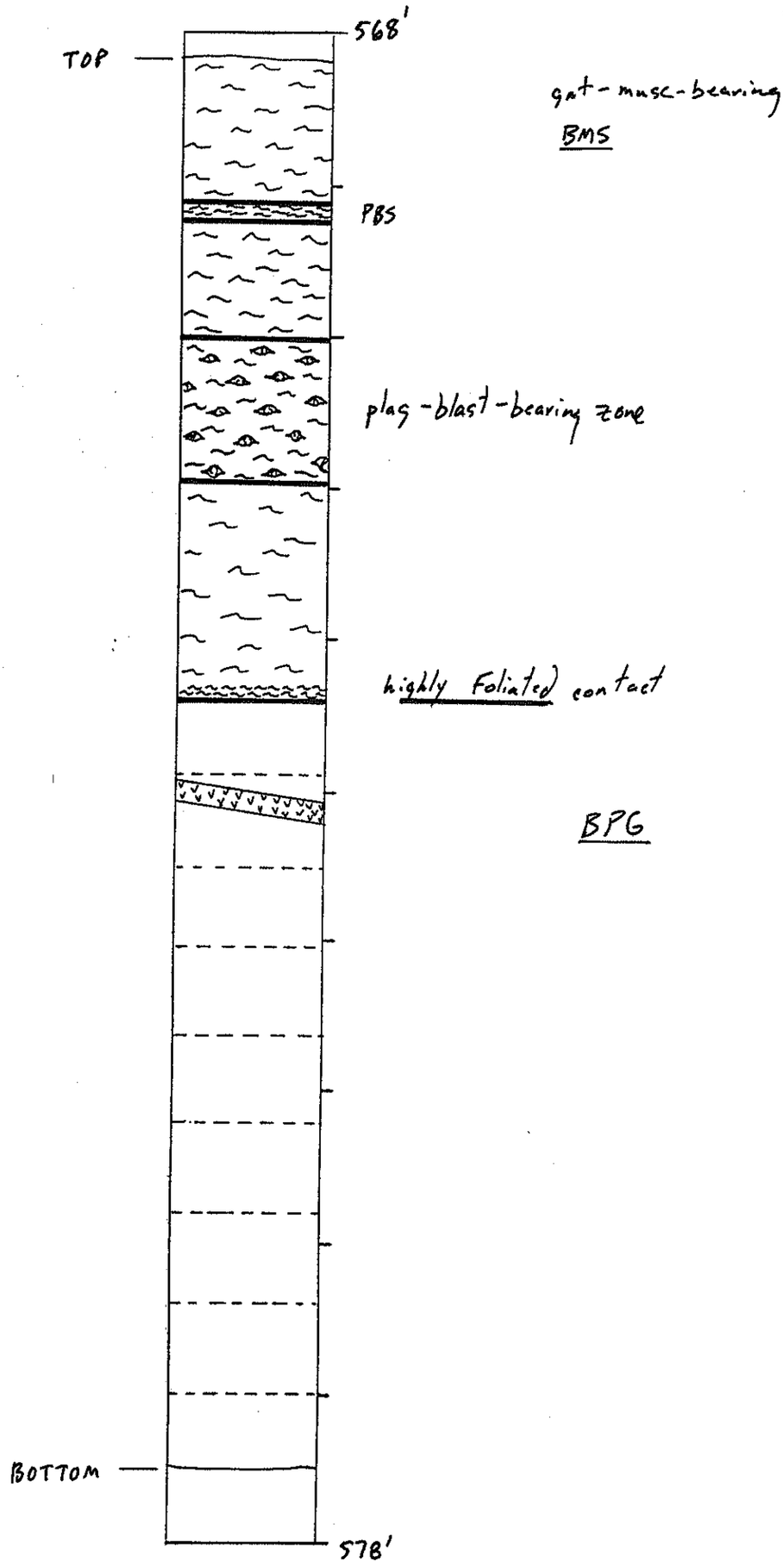
CORE LOG Gillette Castle BOX# 55 INTERVAL 548.9' - 558.7'



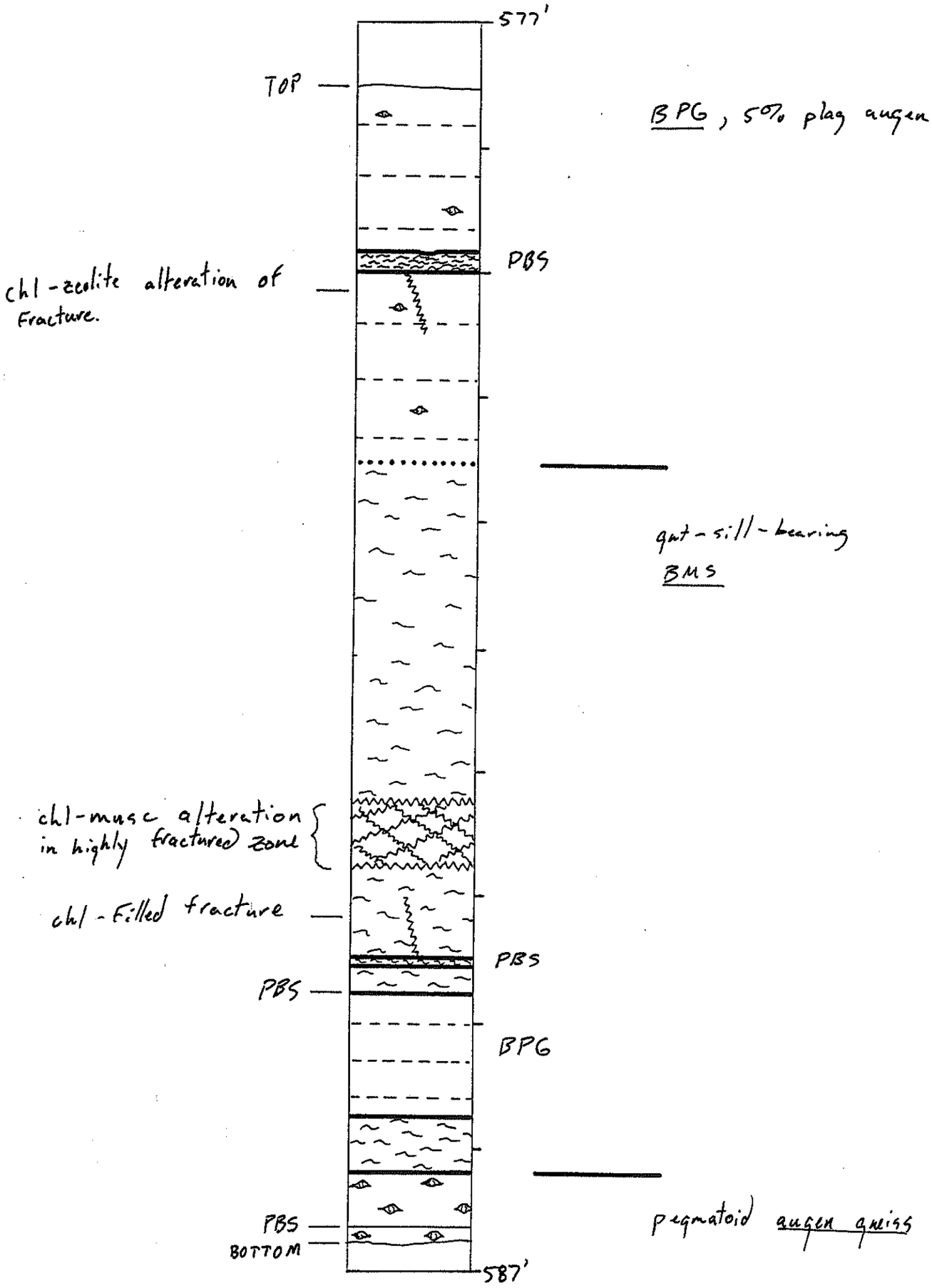
CORE LOG Gillette Castle BOX# 56 INTERVAL 558.7'-568.2'



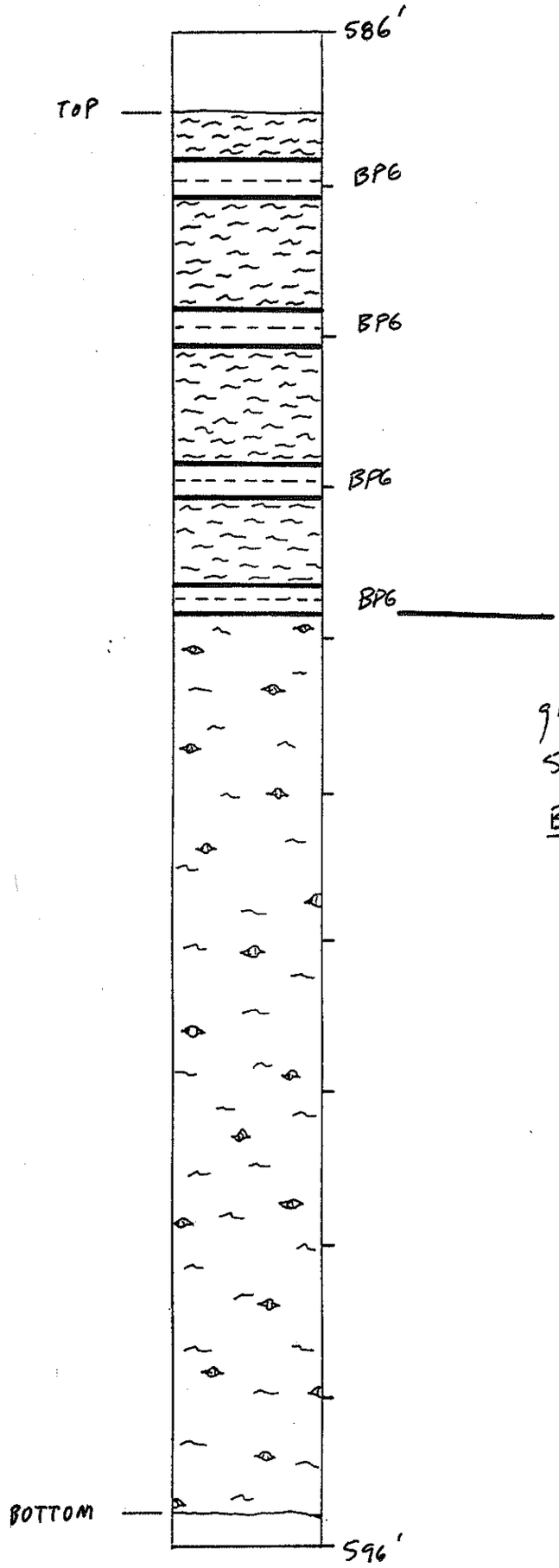
CORE LOG Gillette Castle BOX# 57 INTERVAL 568.2' - 577.5'



CORE LOG Gillette Castle BOX# 58 INTERVAL 577.5'-586.5'



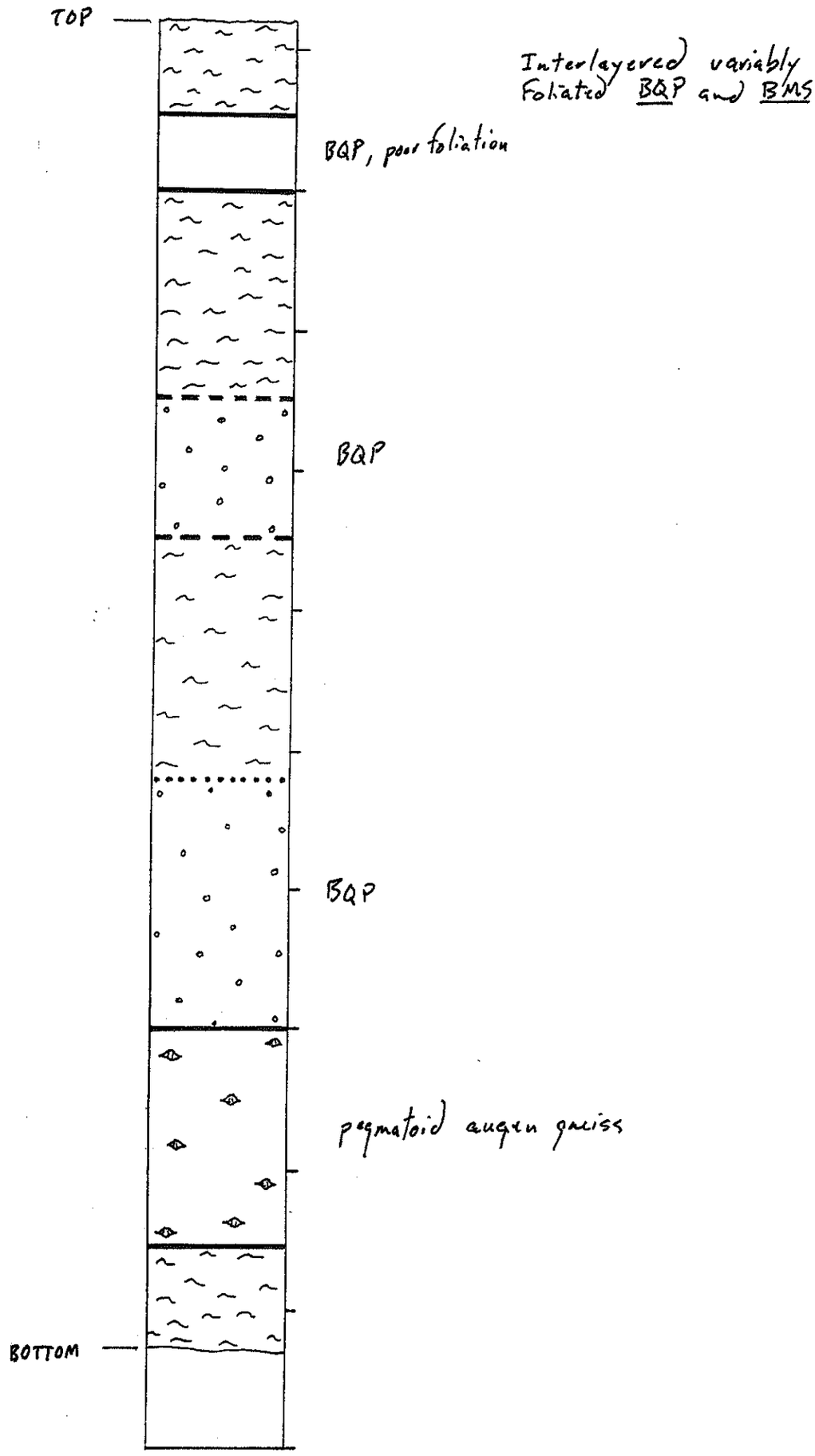
CORE LOG Gillette Castle BOX# 59 INTERVAL 586.5' - 595.8'



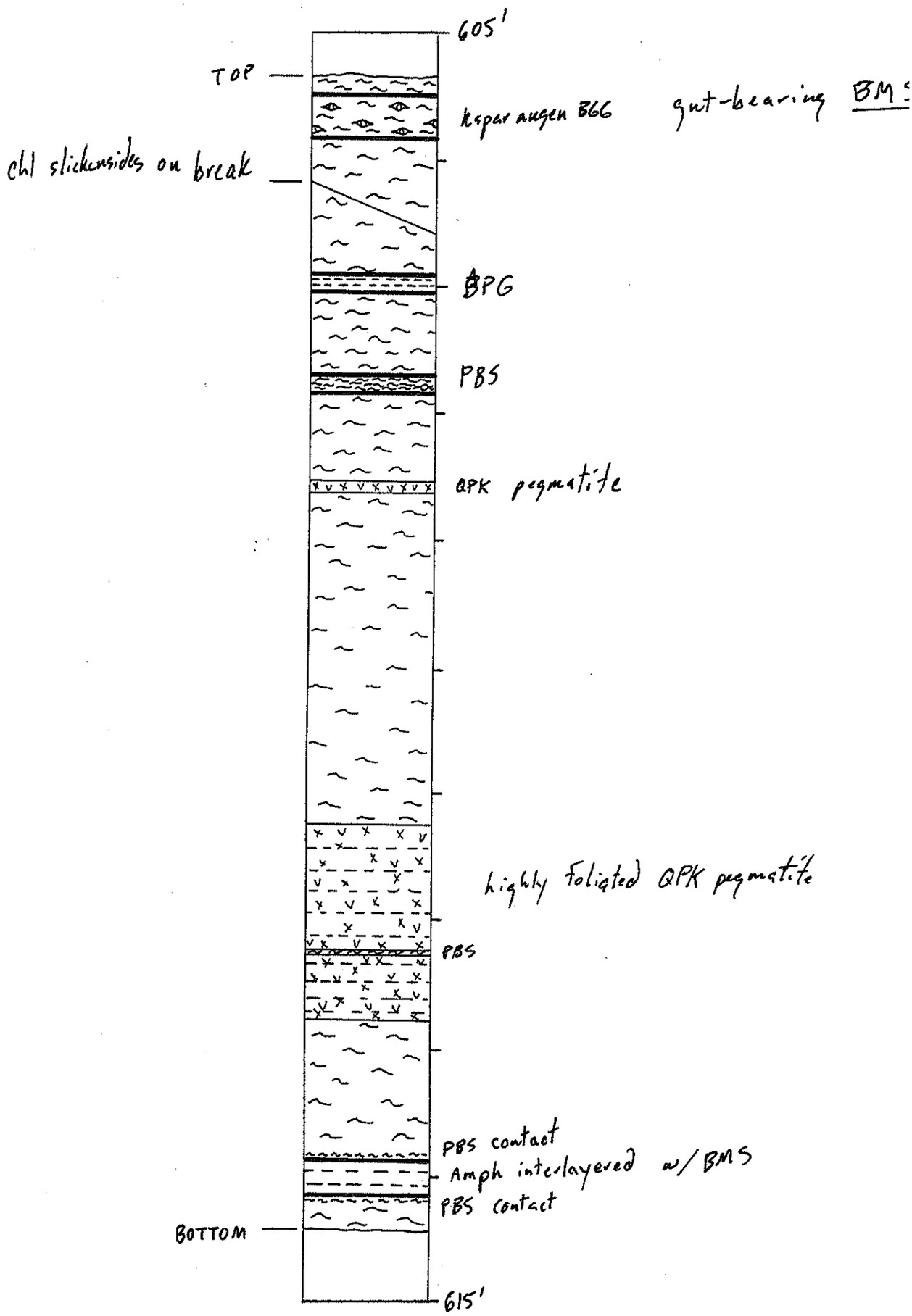
Interlayered BPG / BMS

gnt 50%, plag augen 50%, very biot-rich BMS

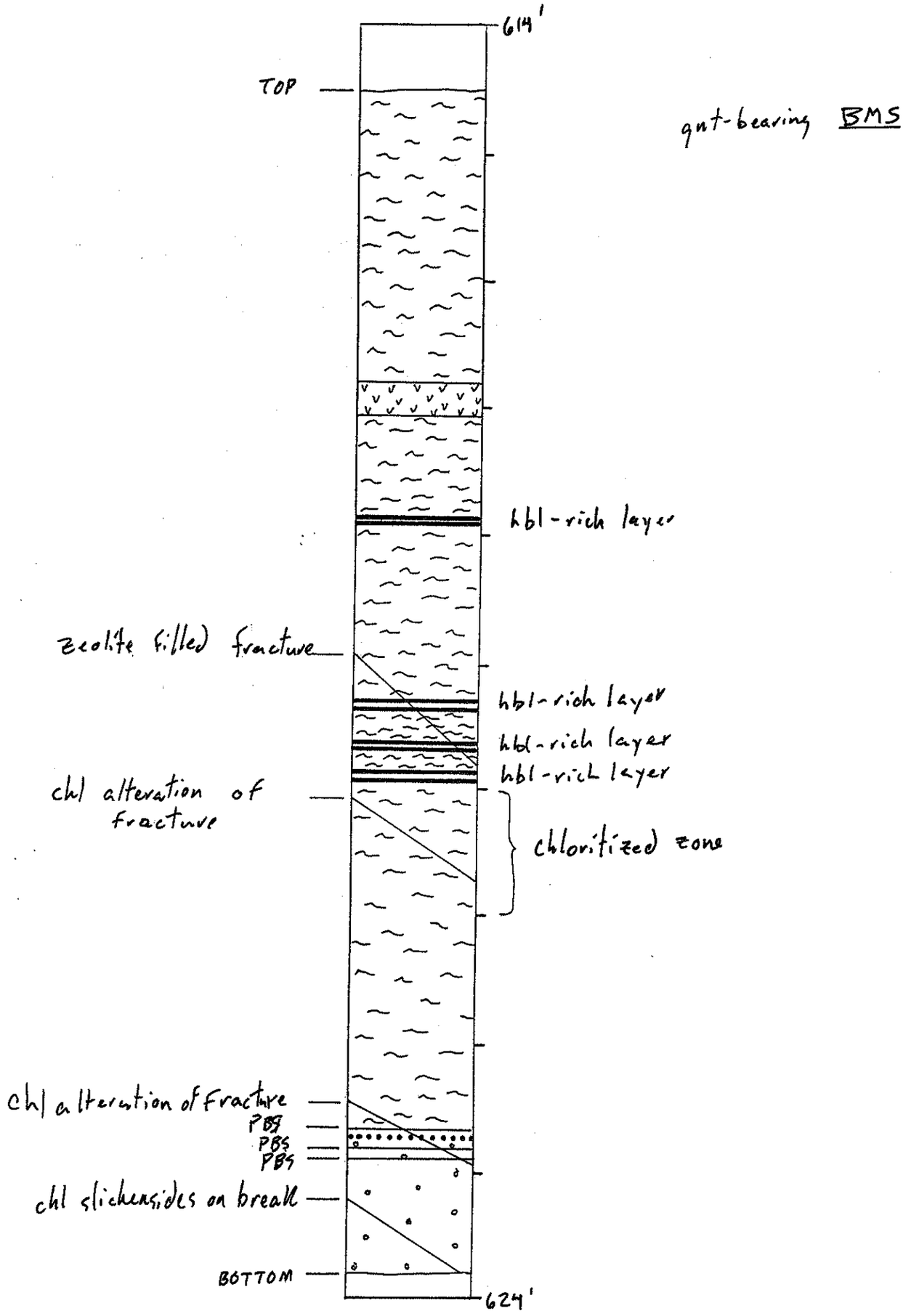
CORE LOG Gillette Castle BOX# 60 INTERVAL 595.8' - 605.3'



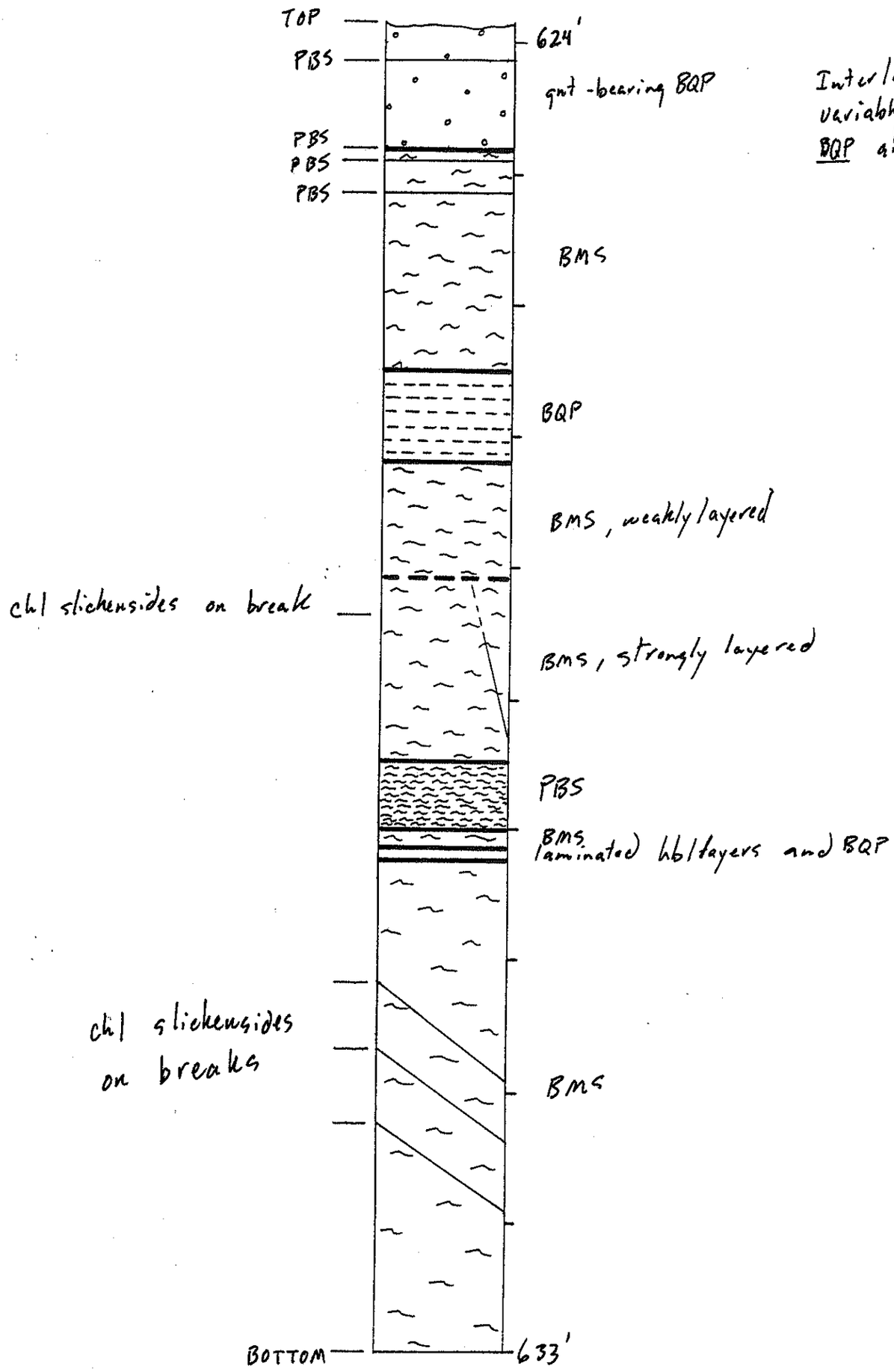
CORE LOG Gillette Castle BOX# 61 INTERVAL 605.3'-614.4'



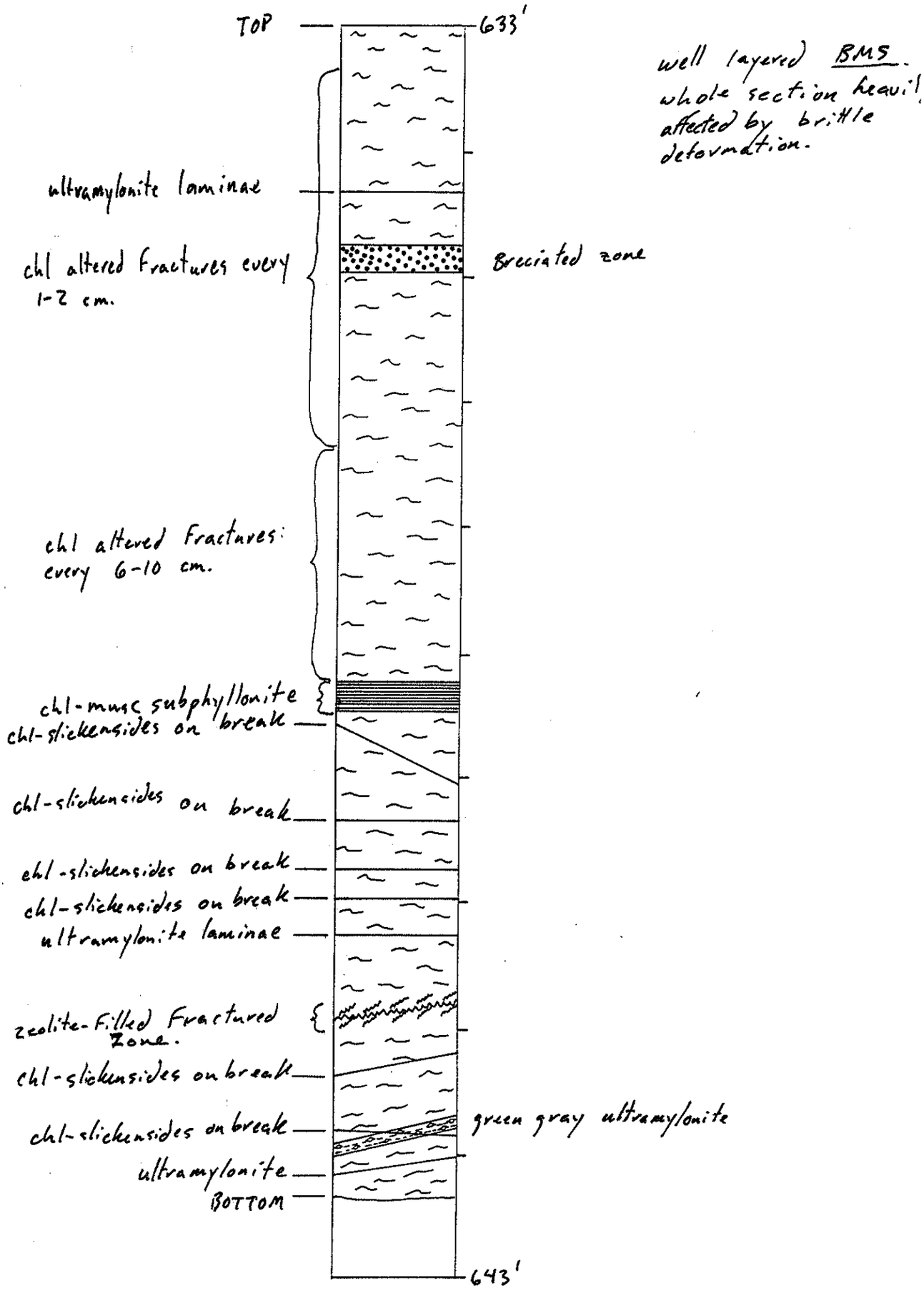
CORE LOG Gillette Castle BOX# 62 INTERVAL 614.4' - 623.9'



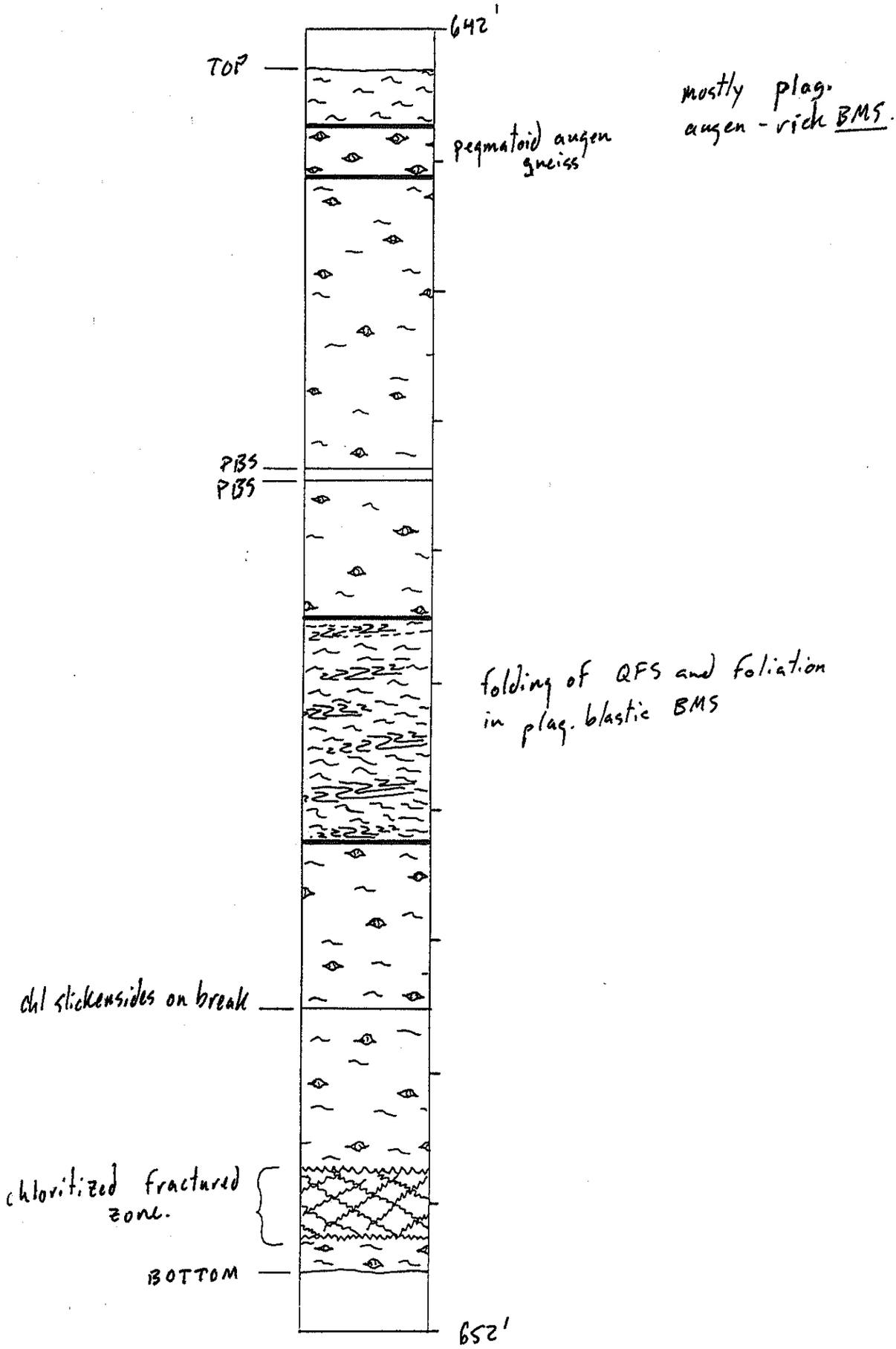
CORE LOG Gillette Castle BOX# 63 INTERVAL 623.9' - 633.0'



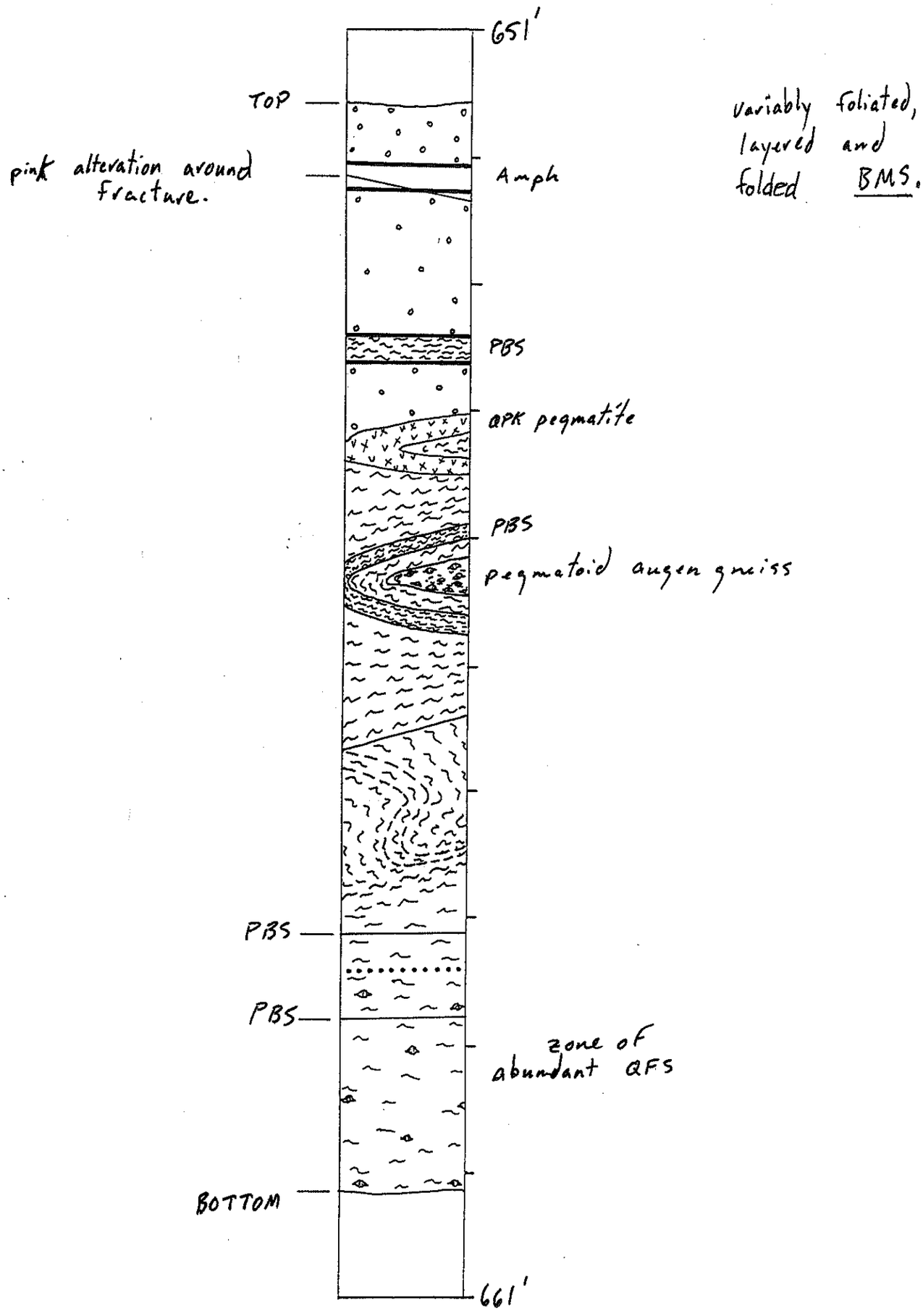
CORE LOG Gillette Castle BOX# 64 INTERVAL 633.0' - 642.3'



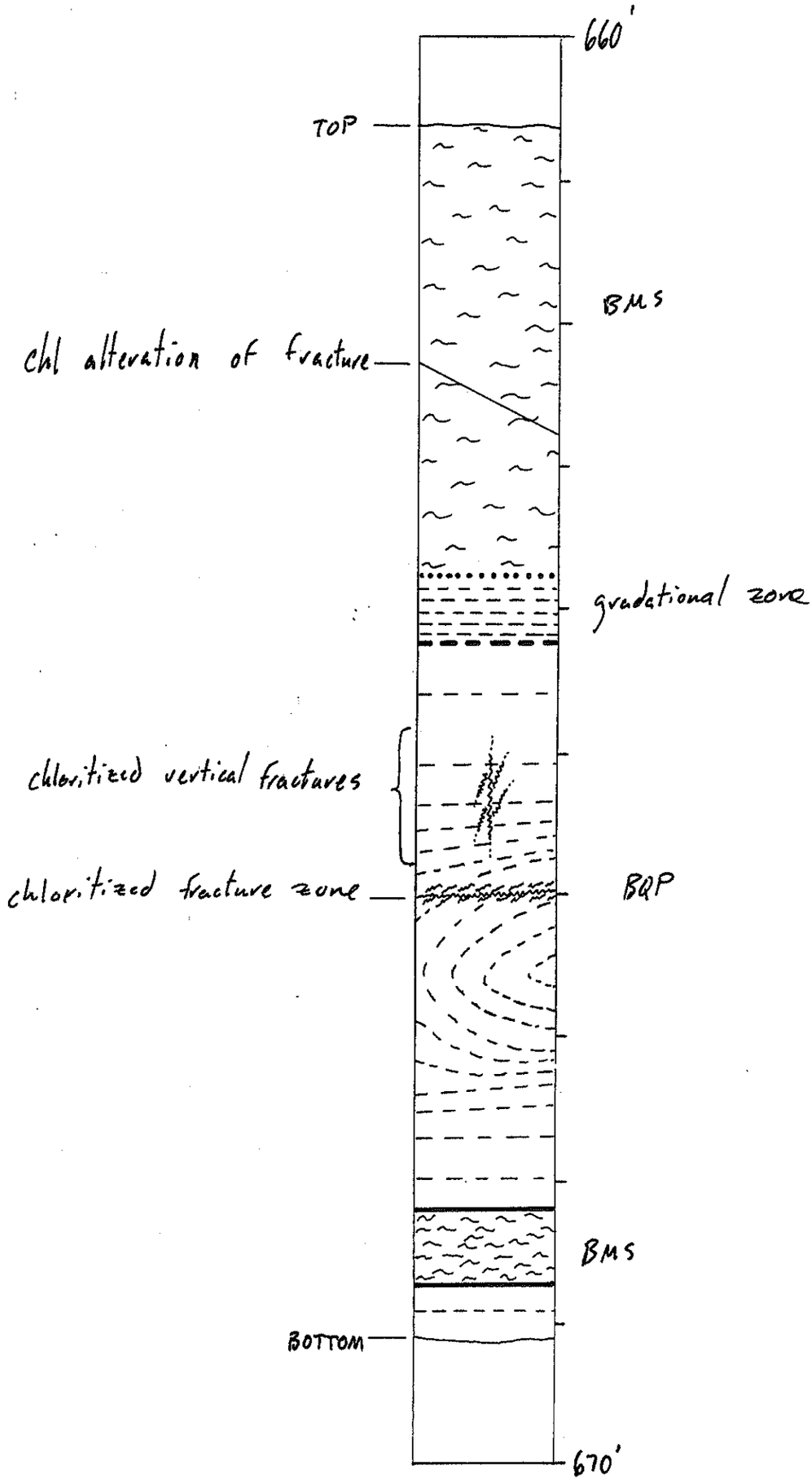
CORE LOG Gillette Castle BOX# 65 INTERVAL 642.3'-651.6'



CORE LOG Gillette Castle BOX# 66 INTERVAL 651.6'-660.1'

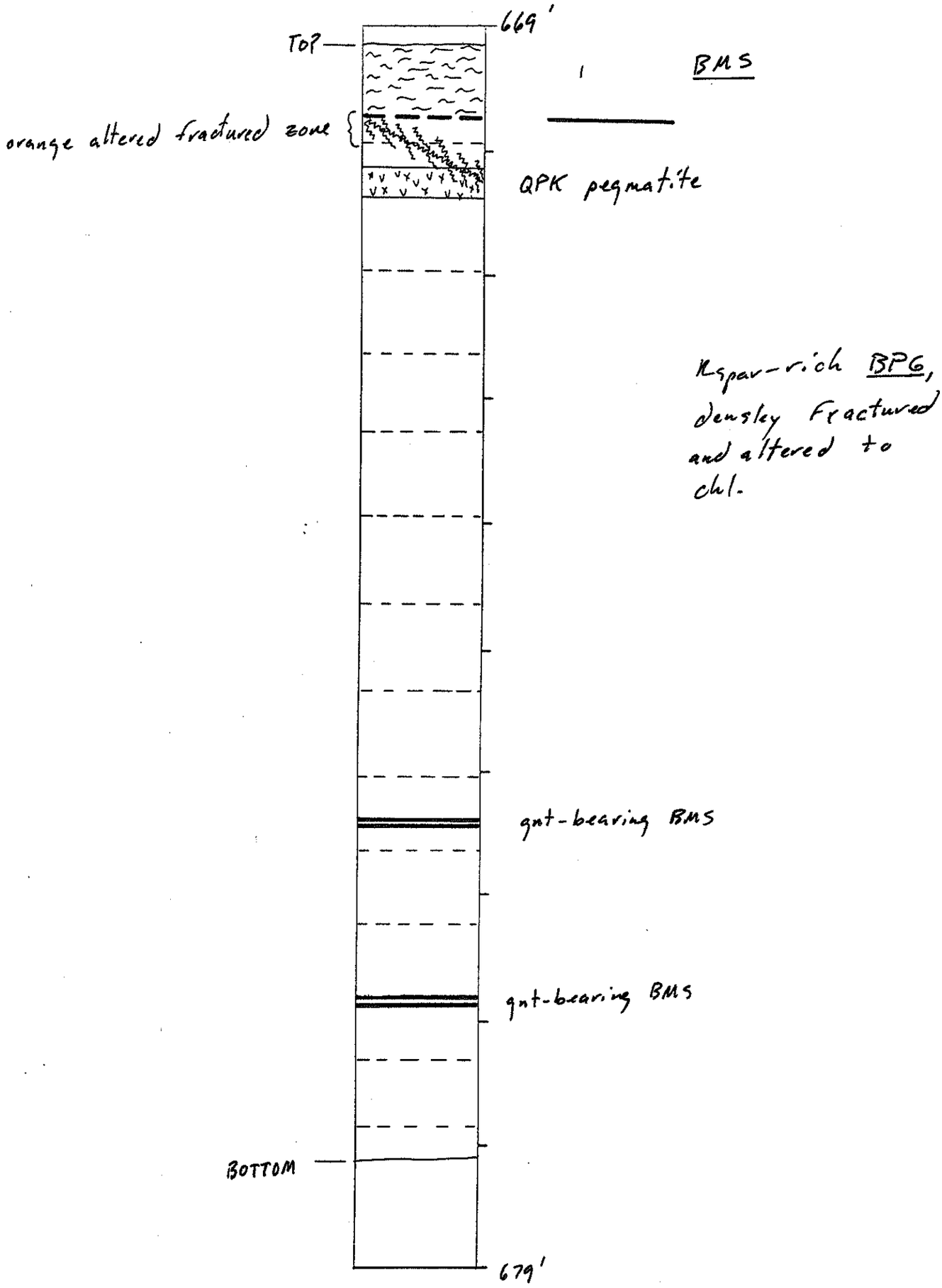


CORE LOG Gillette Castle BOX# 67 INTERVAL 660.1'-669.2'

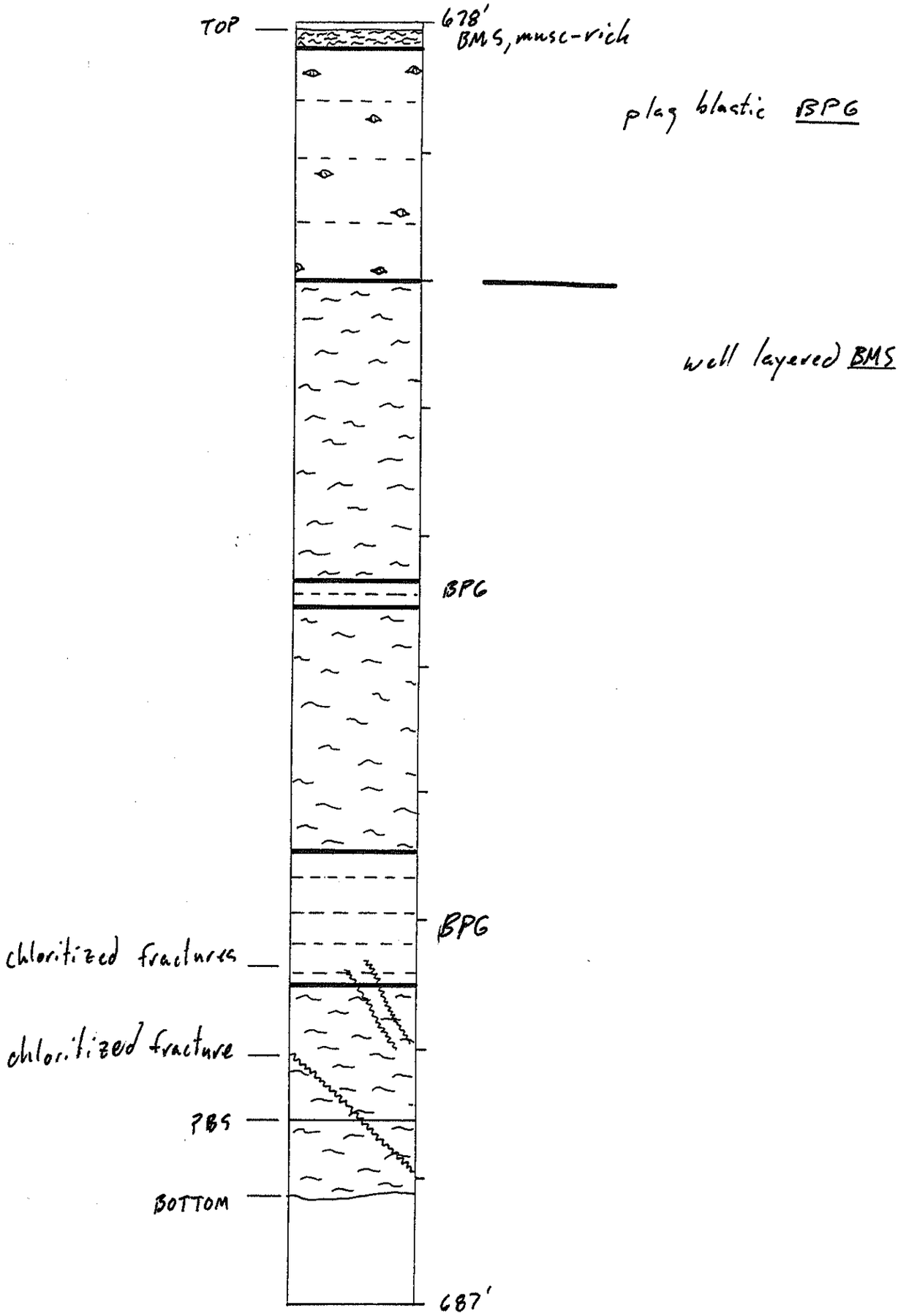


well layered BMS w/ abundant QFS, and BQP.

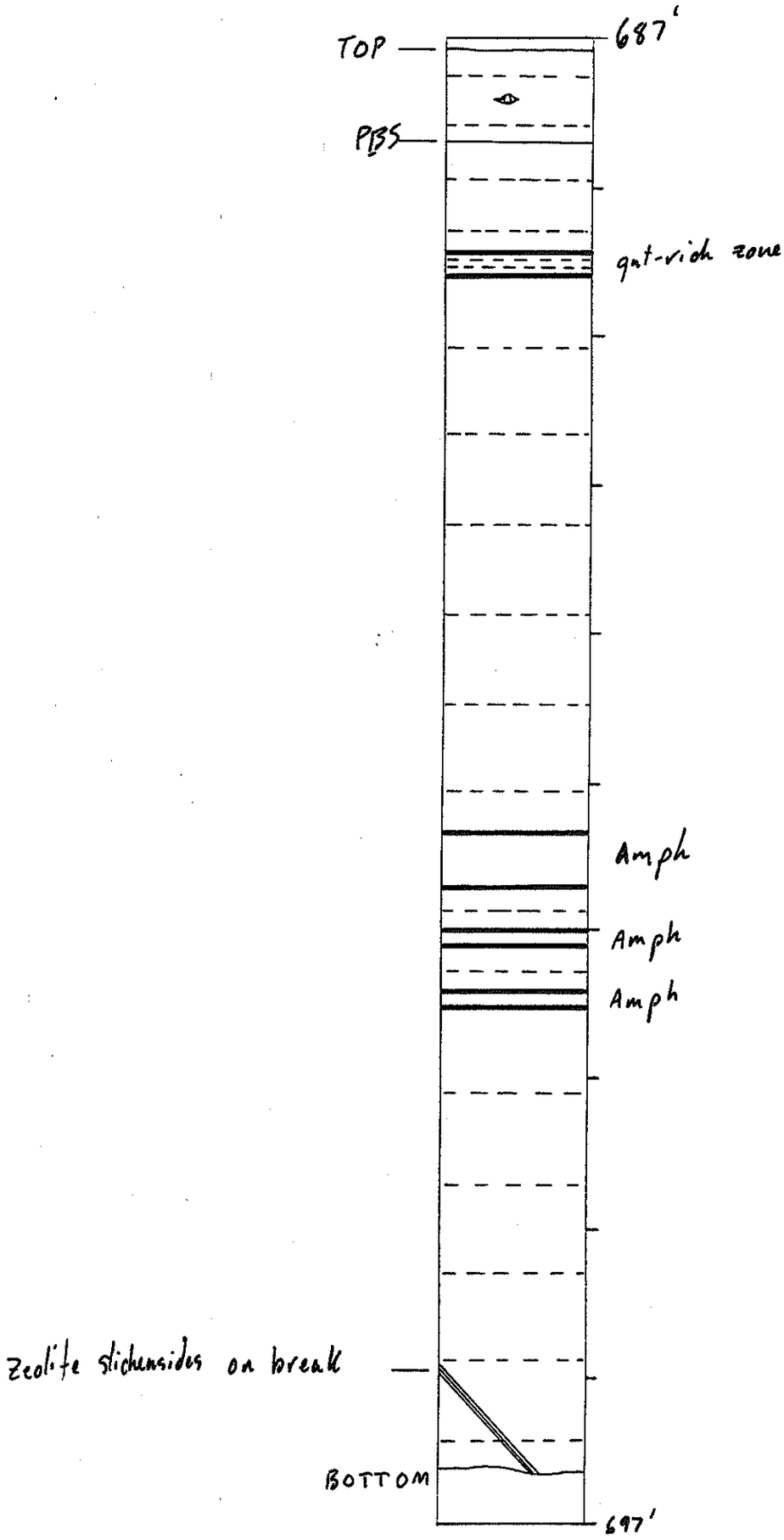
CORE LOG Gillette Castle BOX# 68 INTERVAL 669.2'-678.1'



CORE LOG Gillette Castle BOX# 69 INTERVAL 678.1' - 687.1'

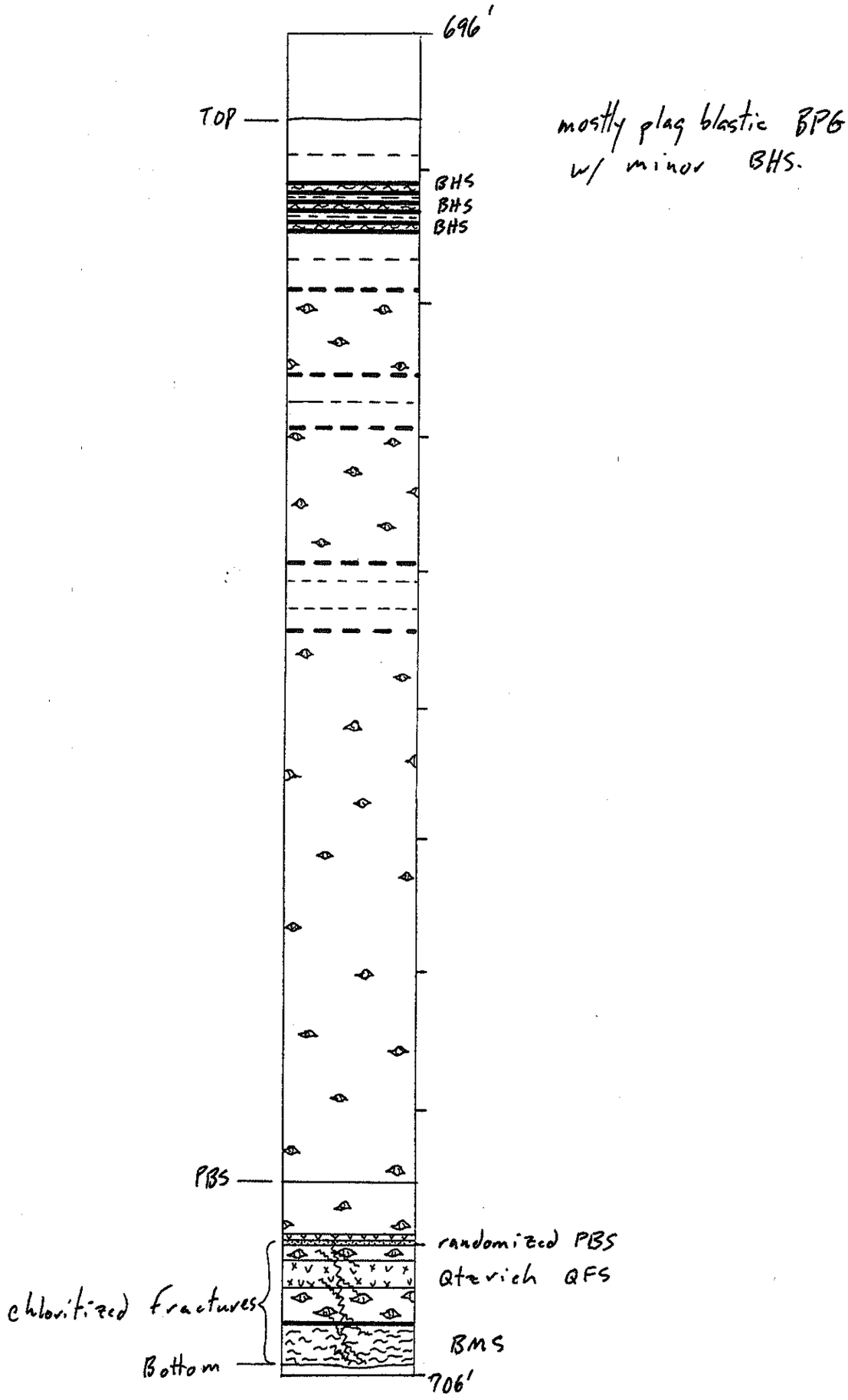


CORE LOG Gillette Castle BOX# 70 INTERVAL 687.1' - 696.6'

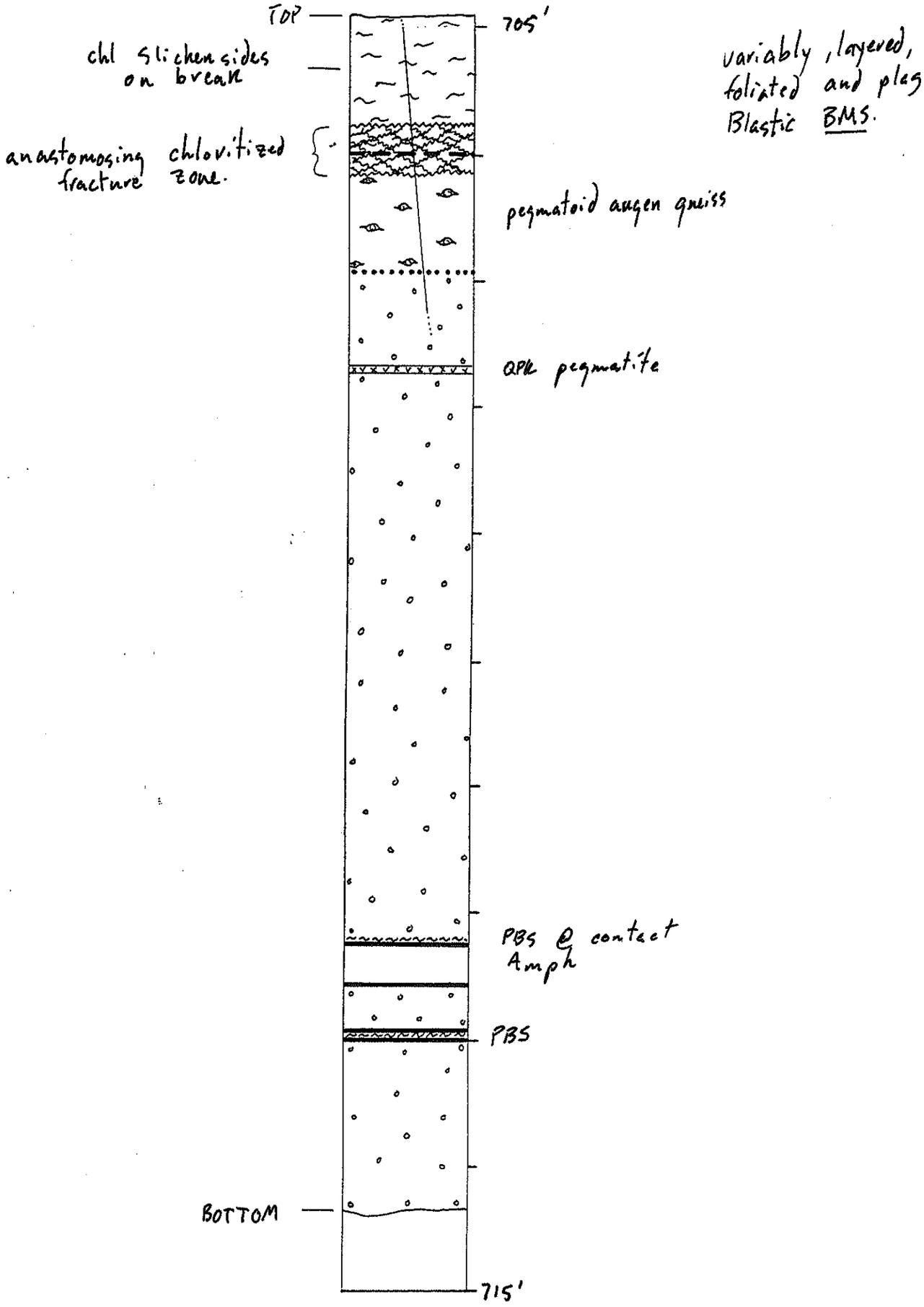


BPG, biot-rich folia common, Some Amph.

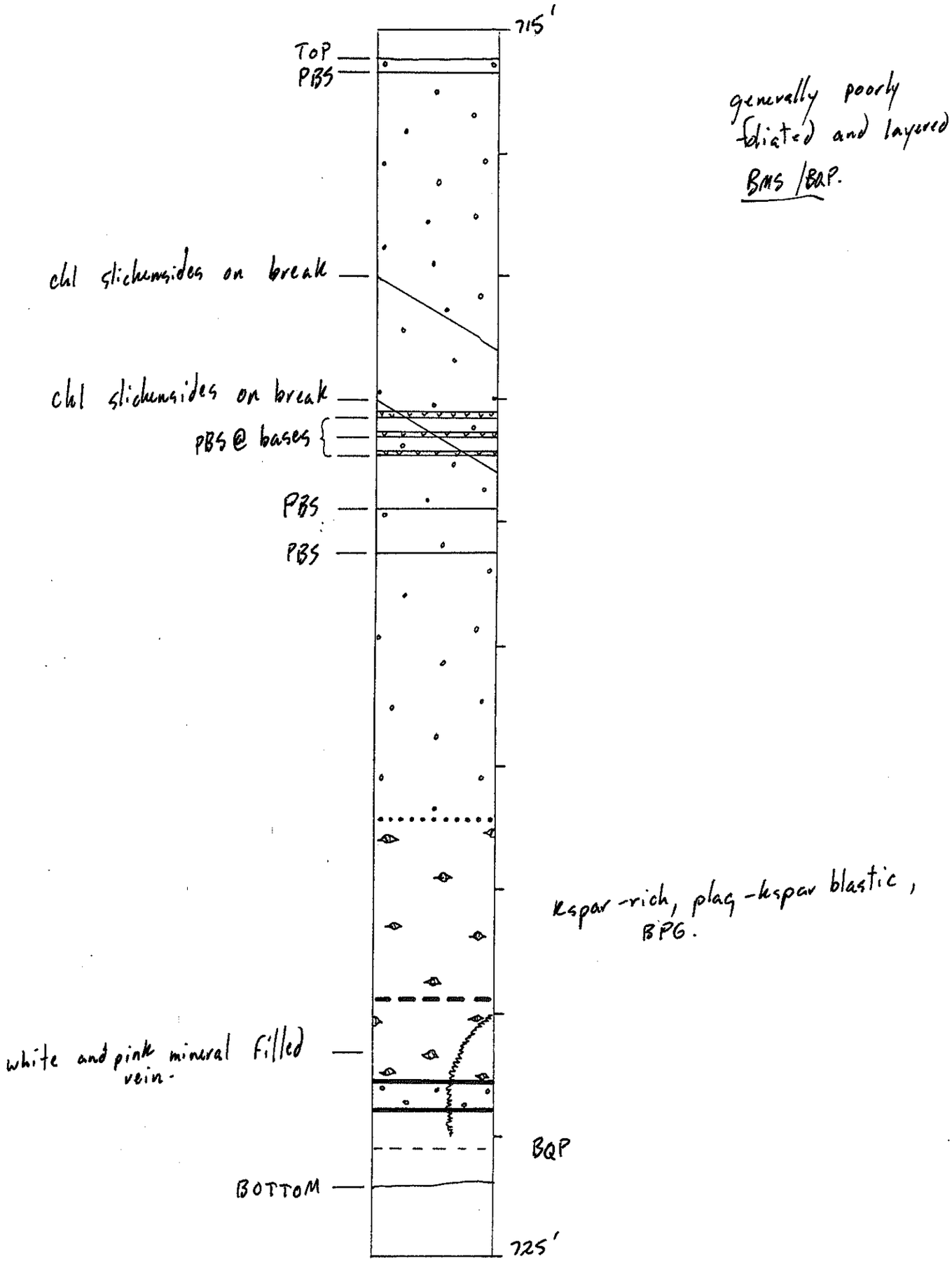
CORE LOG Gillette Castle BOX# 71 INTERVAL 696.6'-705.9'



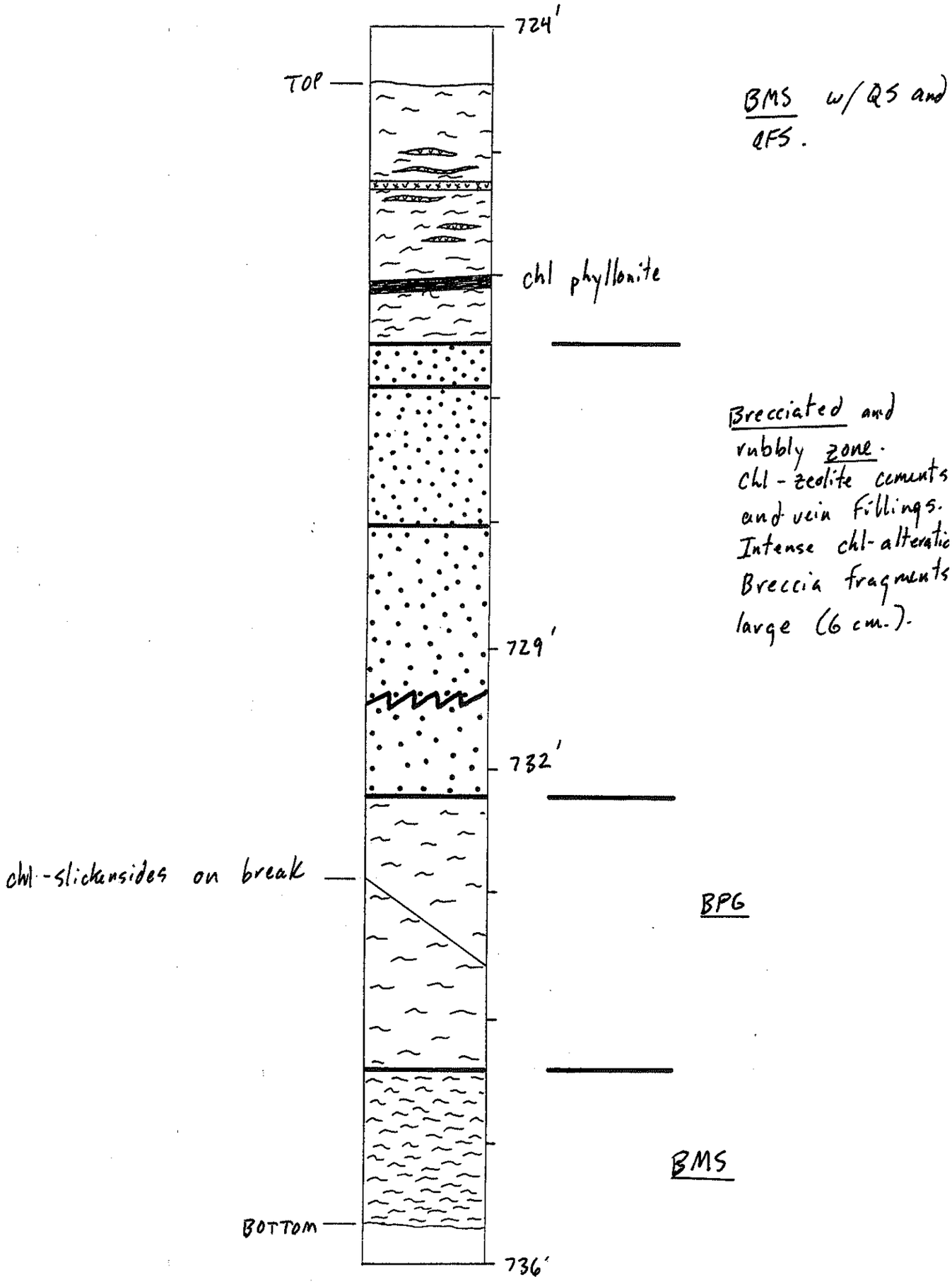
CORE LOG Gillette Castle BOX# 72 INTERVAL 705.9' - 715.3'



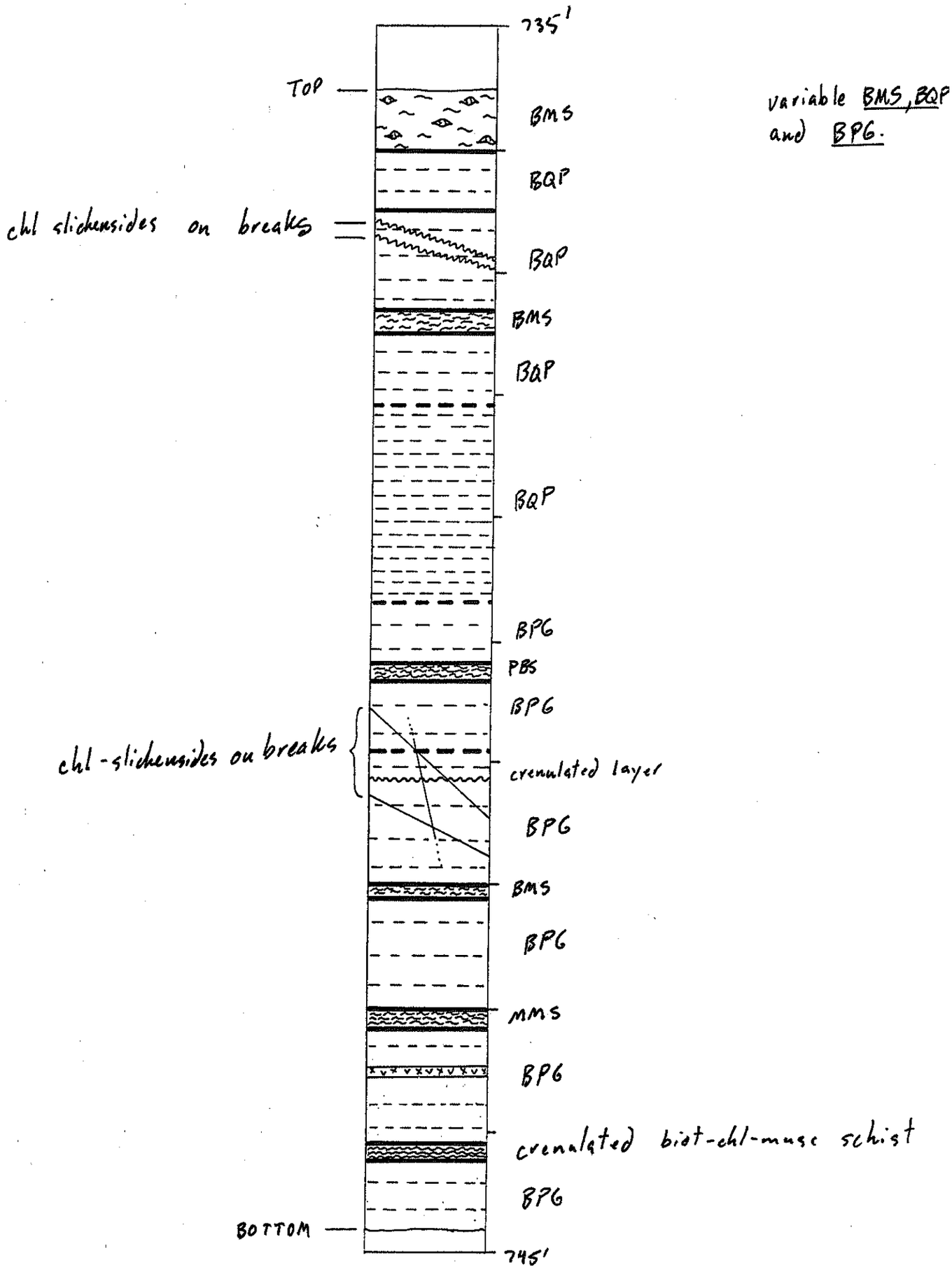
CORE LOG Gillette Castle BOX# 73 INTERVAL 715.3' - 724.4'



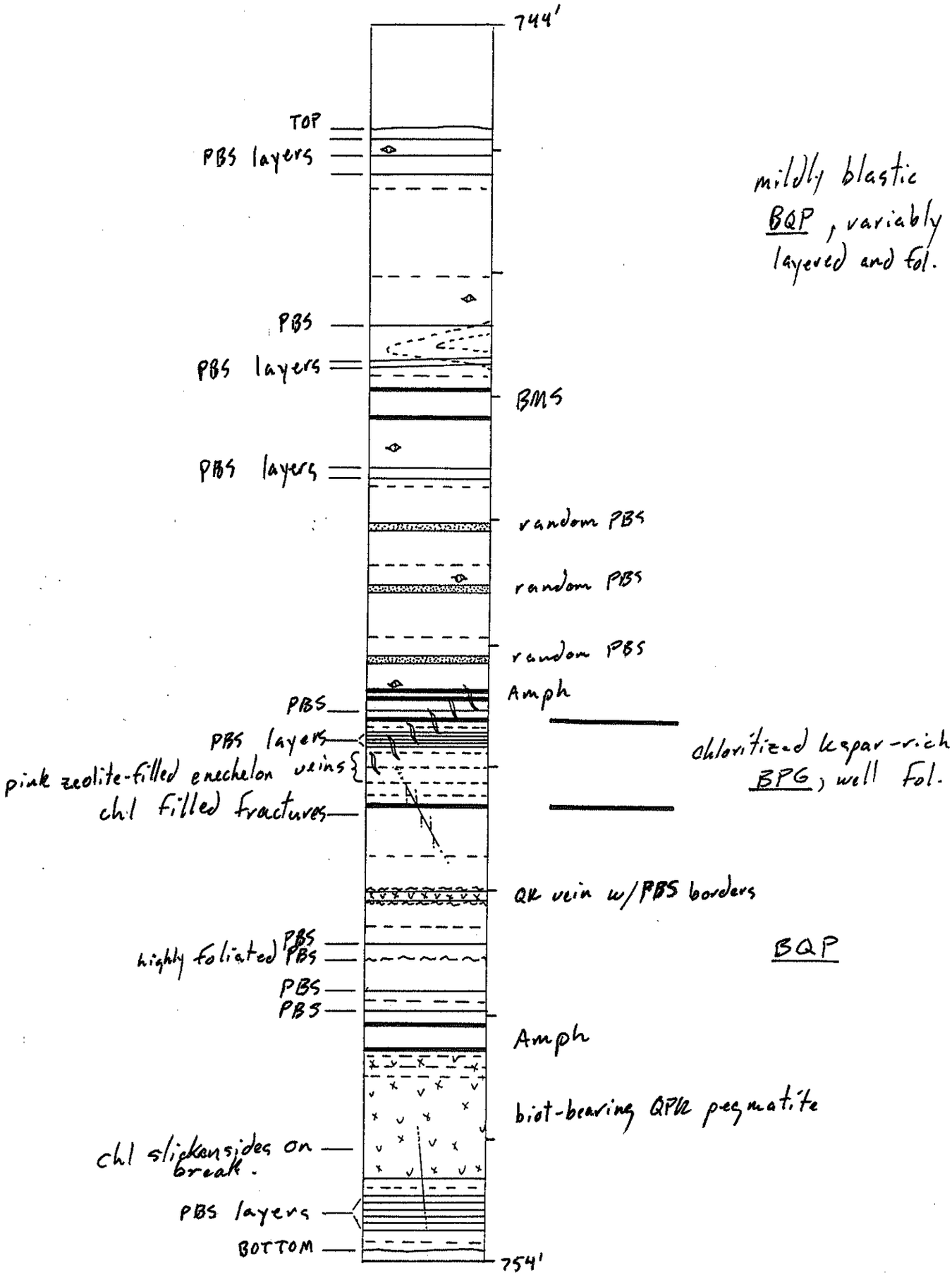
CORE LOG Gillette Castle BOX# 74 INTERVAL 724.4' - 735.5'



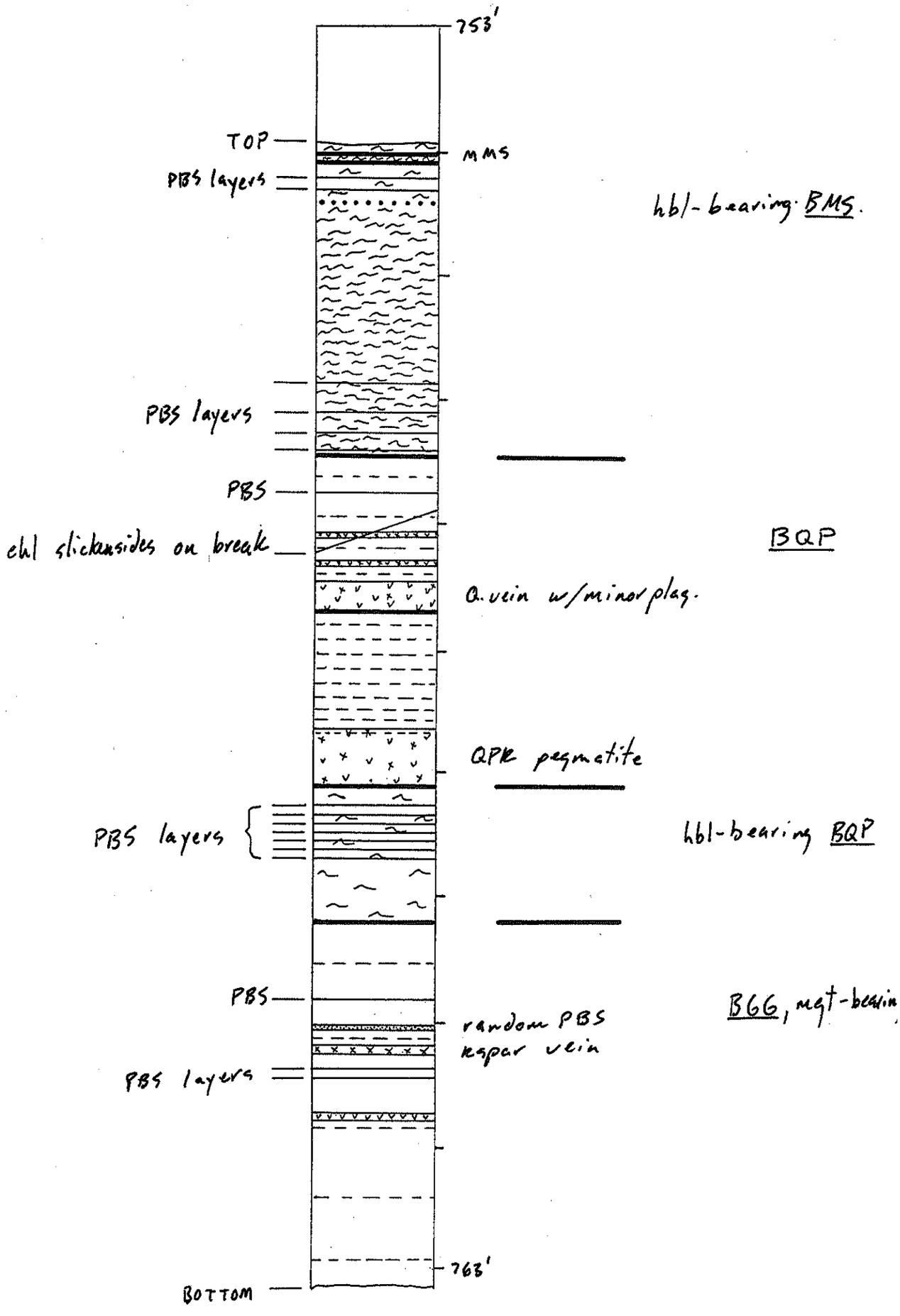
CORE LOG Gillette Castle BOX# 75 INTERVAL 735.5'-744.8'



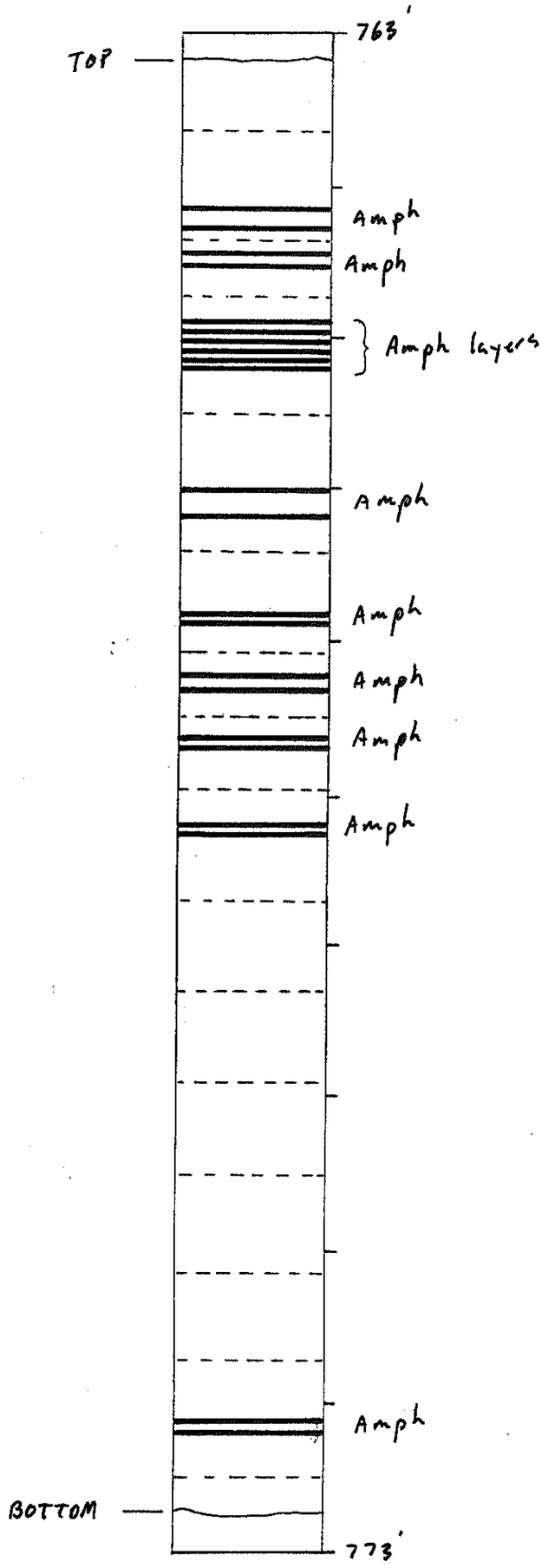
CORE LOG Gillette Castle BOX# 76 INTERVAL 744.8' - 753.9'



CORE LOG Gillette Castle BOX# 77 INTERVAL 753.9' - 763.2'

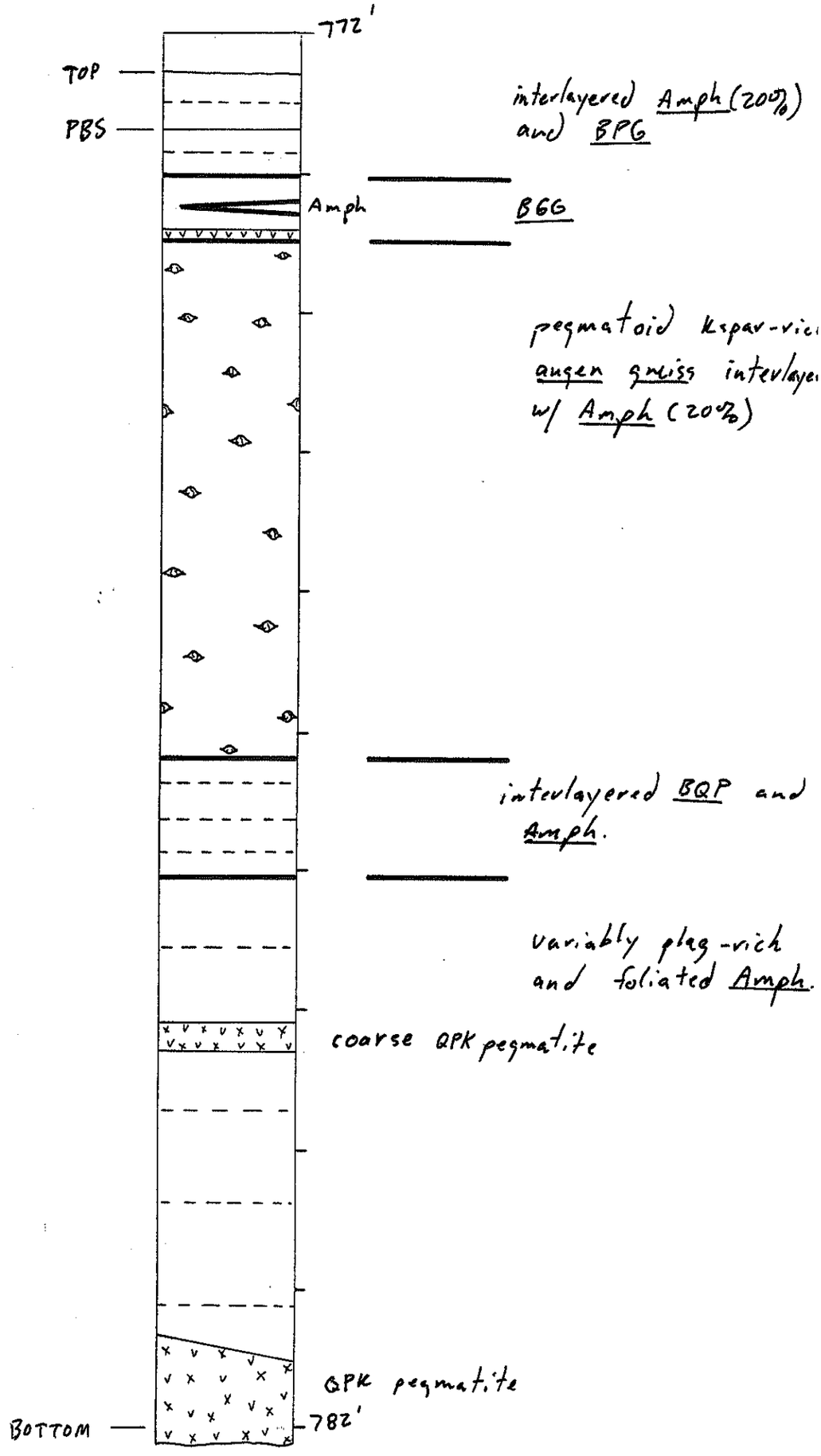


CORE LOG Gillette Castle BOX# 78 INTERVAL 763.2' - 772.3'

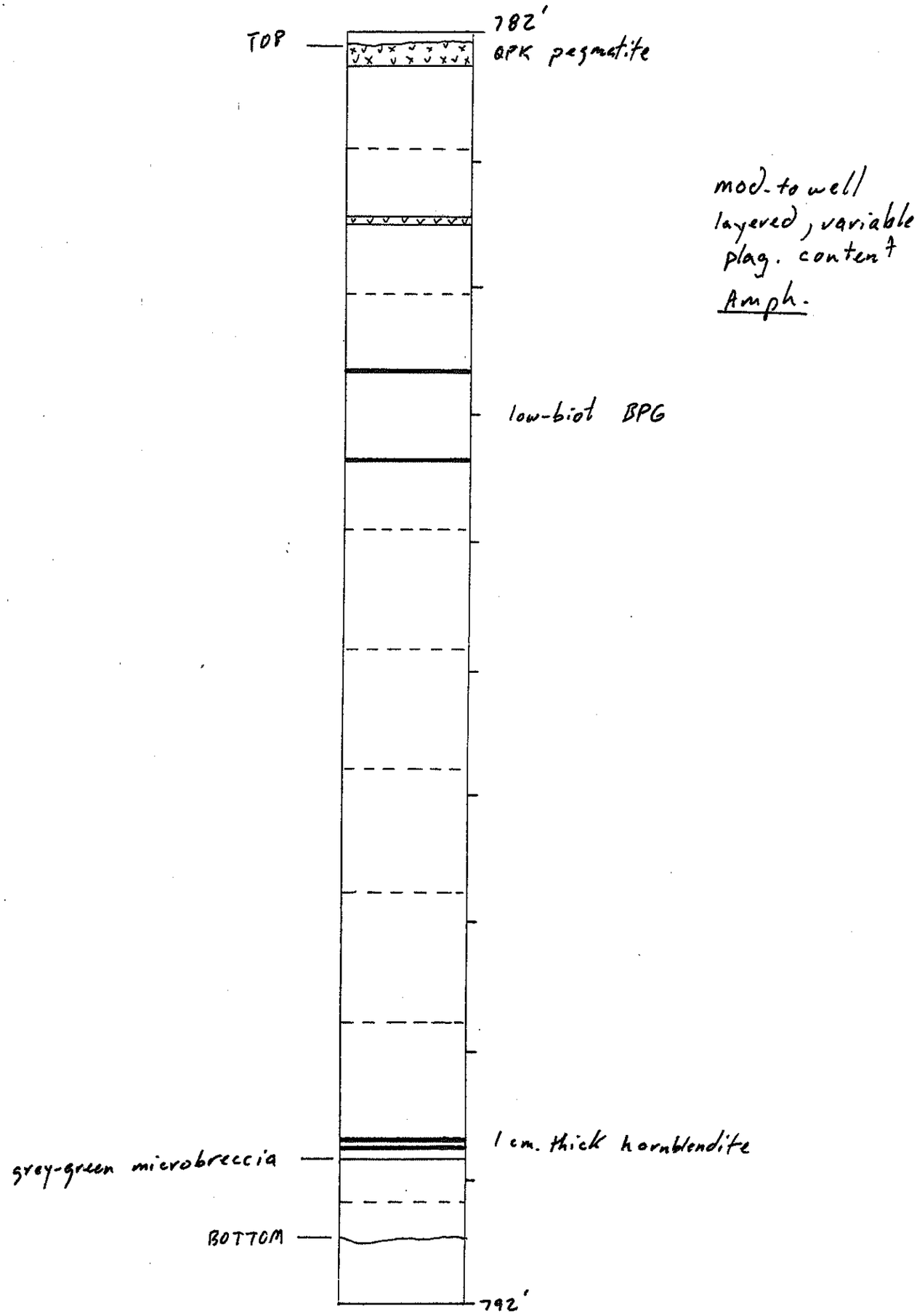


BGG, mgt-bearing w/ Amph layers abundant (only major layers shown).

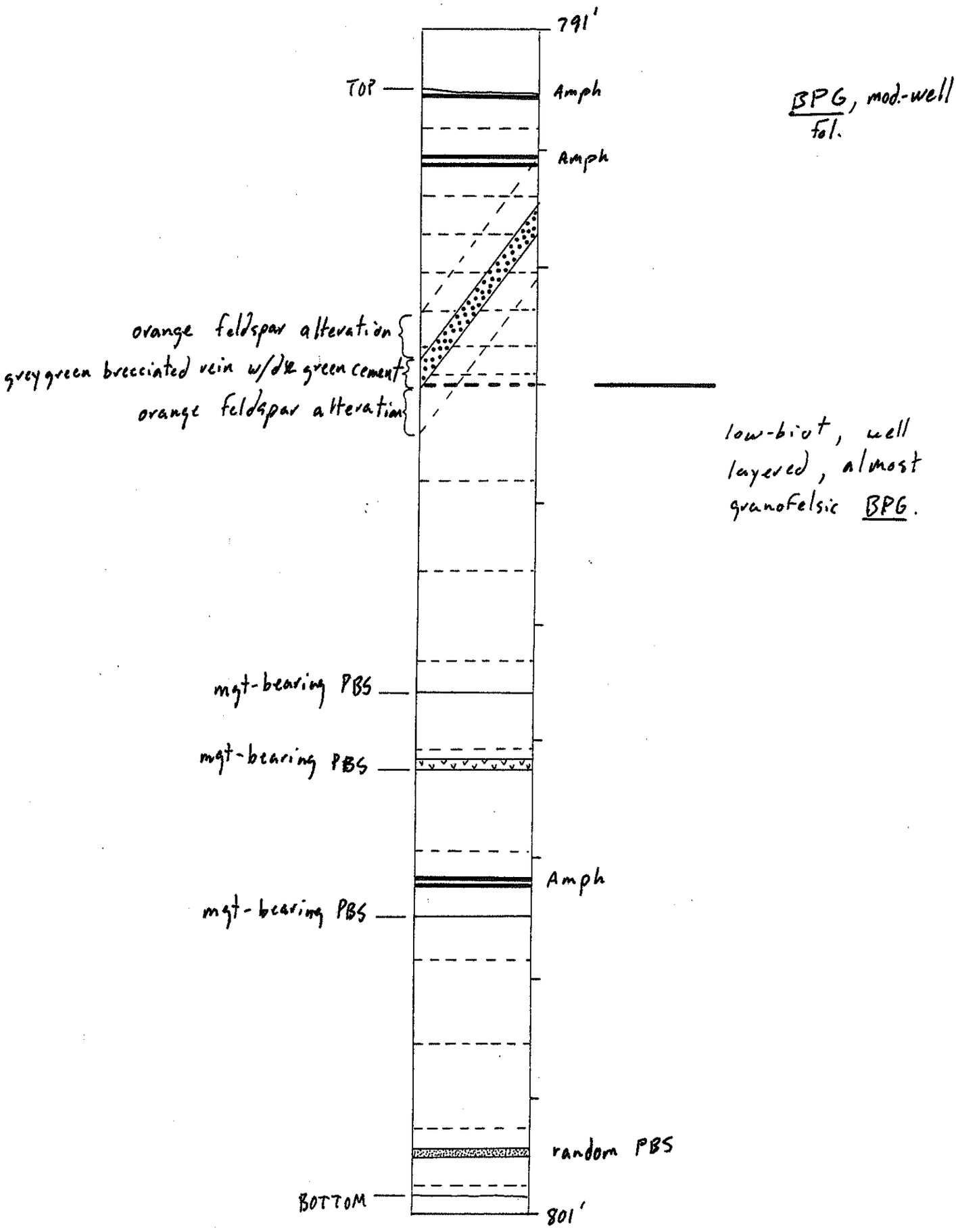
CORE LOG Gillette Castle BOX# 79 INTERVAL 772.3' - 782.1'



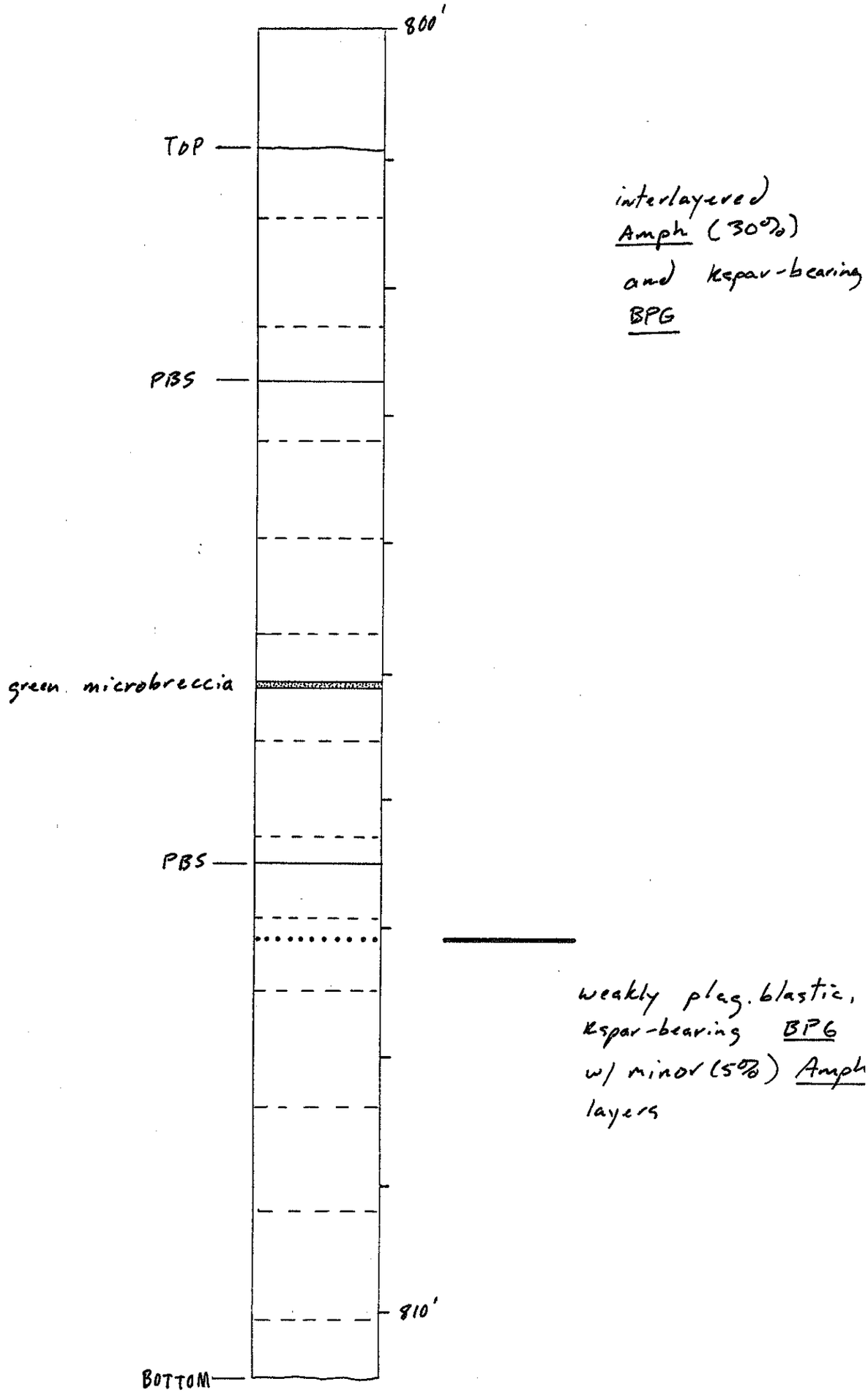
CORE LOG Gillette Castle BOX# 80 INTERVAL 782.1' - 791.5'



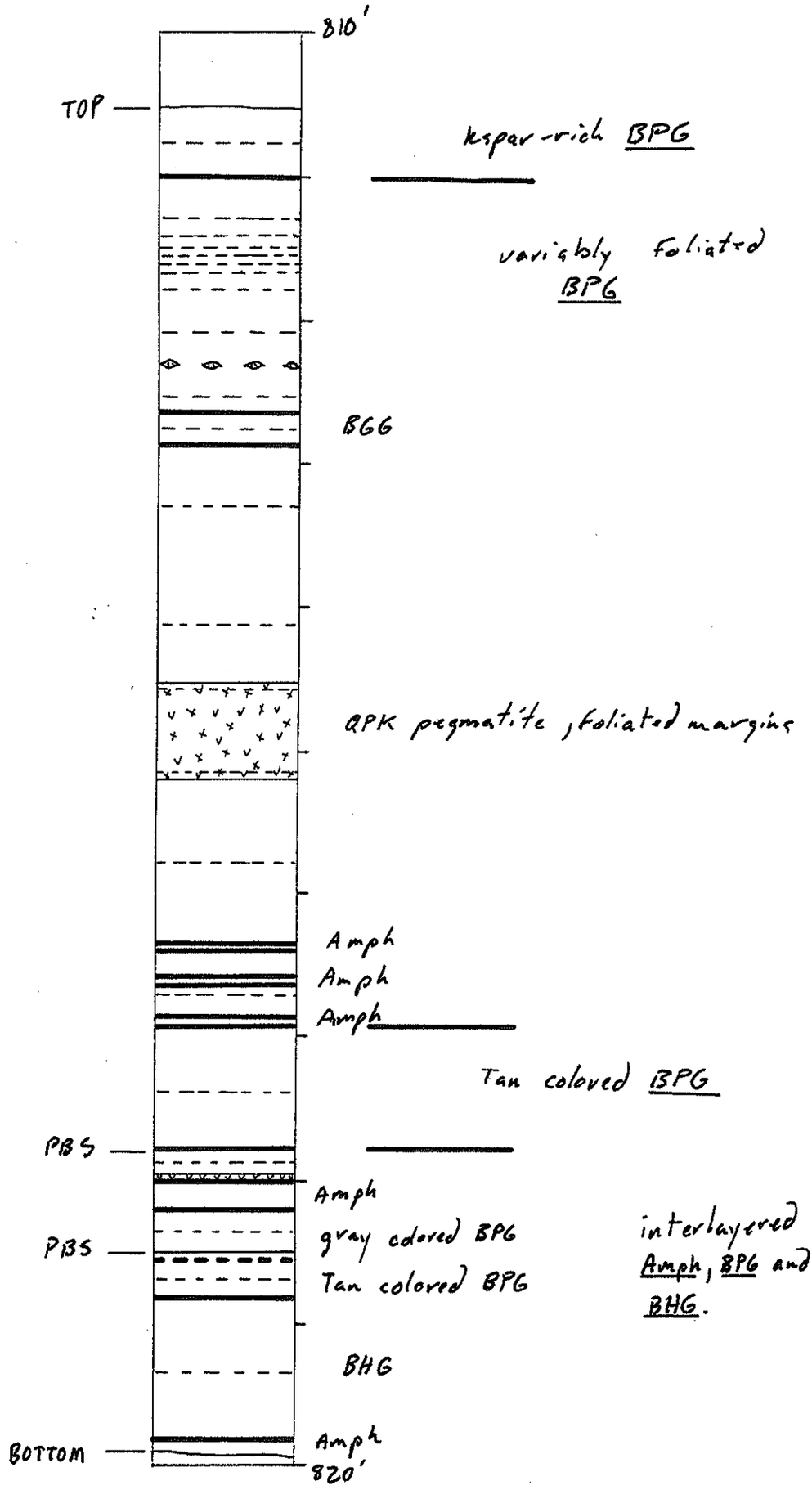
CORE LOG Gillette Castle BOX# 81 INTERVAL 791.5' - 800.9'



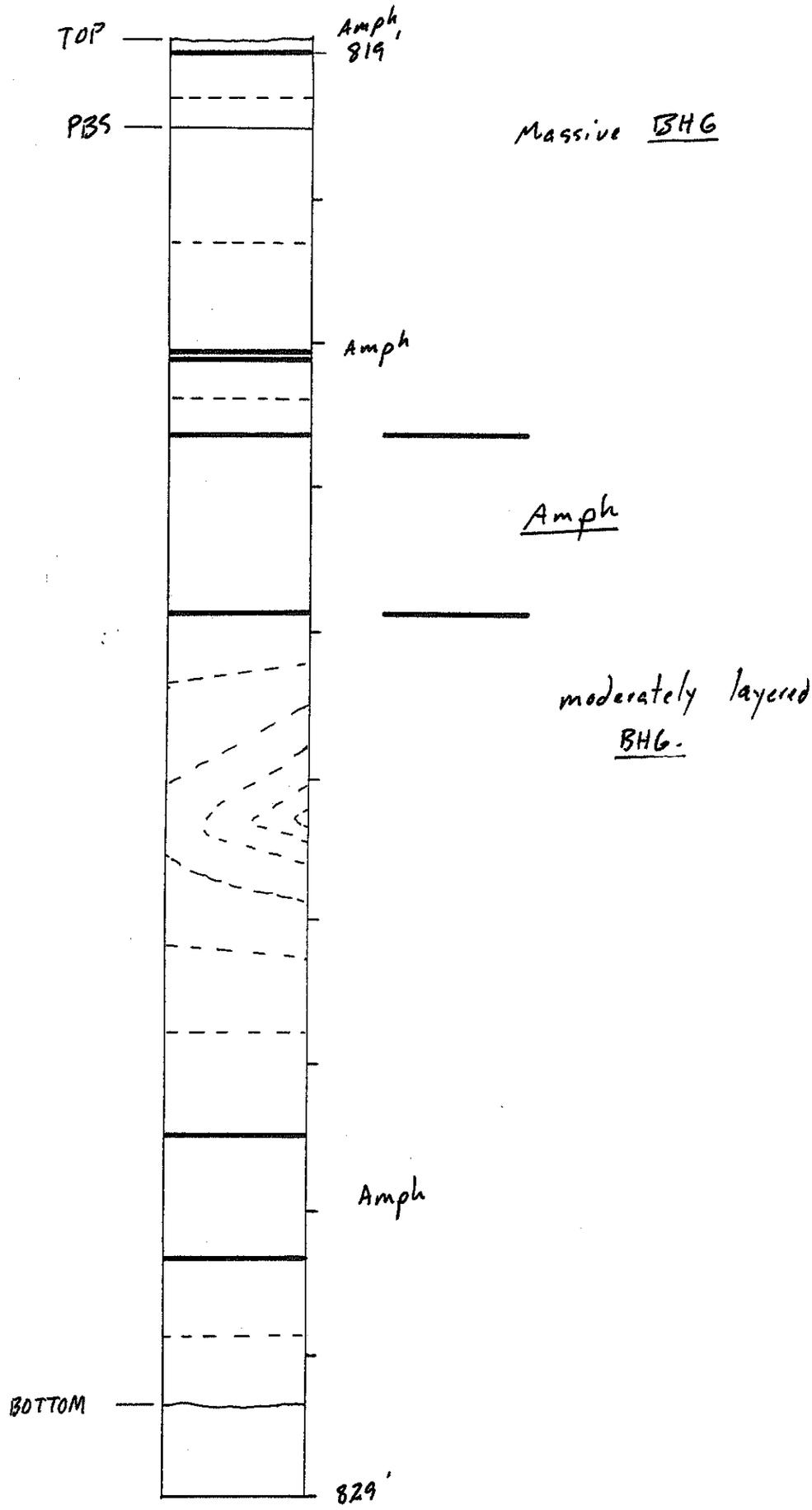
CORE LOG Gillette Castle BOX# 82 INTERVAL 800.9' - 810.5'



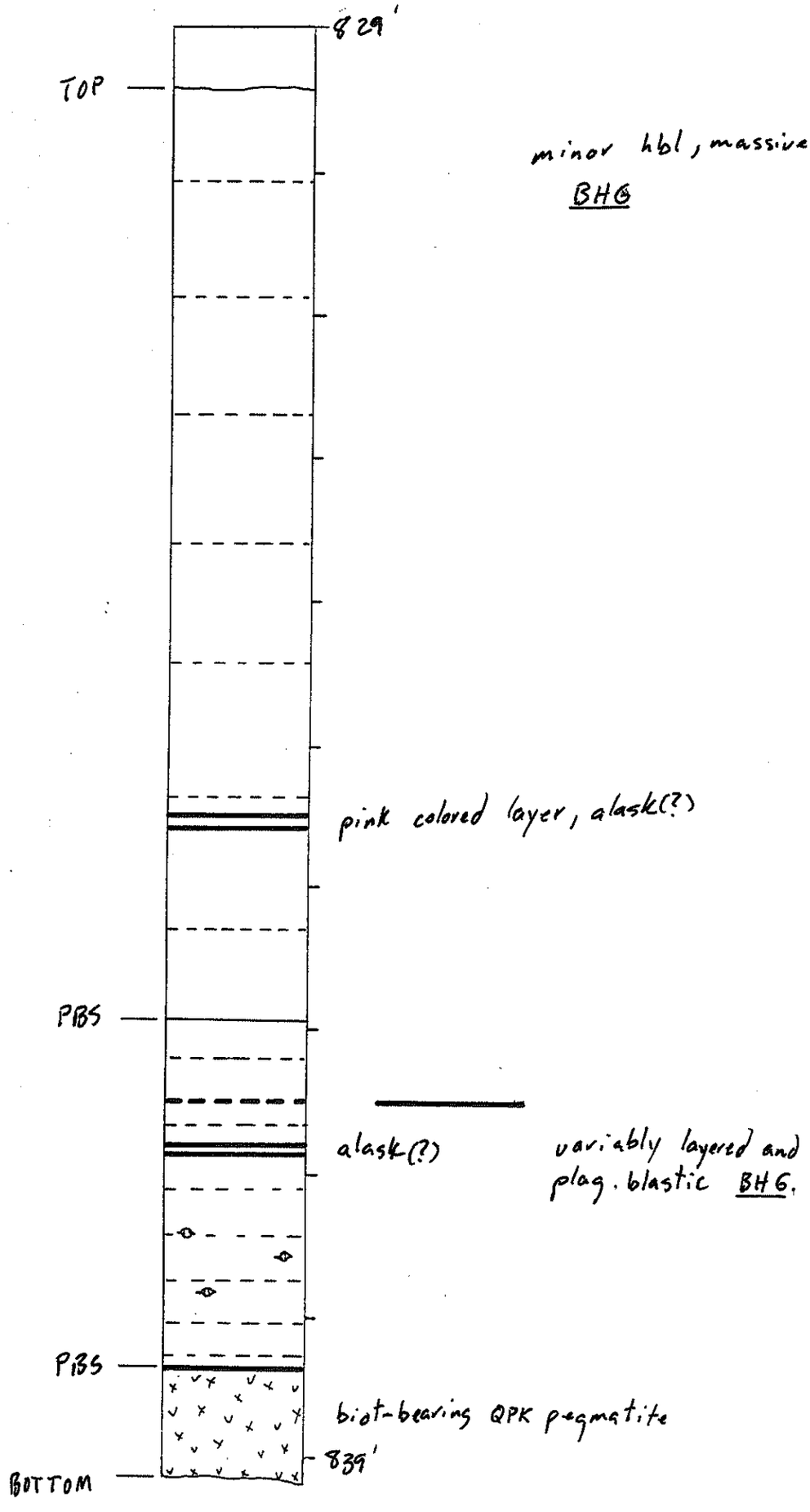
CORE LOG Gillette Castle BOX# 83 INTERVAL 810.5' - 819.9'



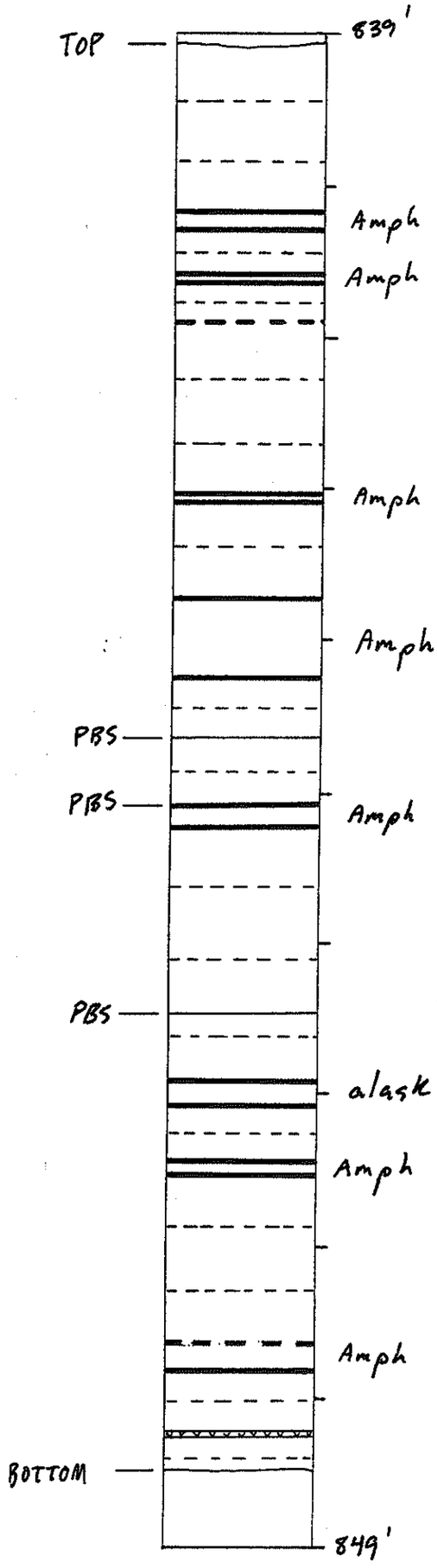
CORE LOG Gillette Castle BOX# 8H INTERVAL 819.9' - 829.3'



CORE LOG Gillette Castle BOX# 85 INTERVAL 829.3'-839.1'

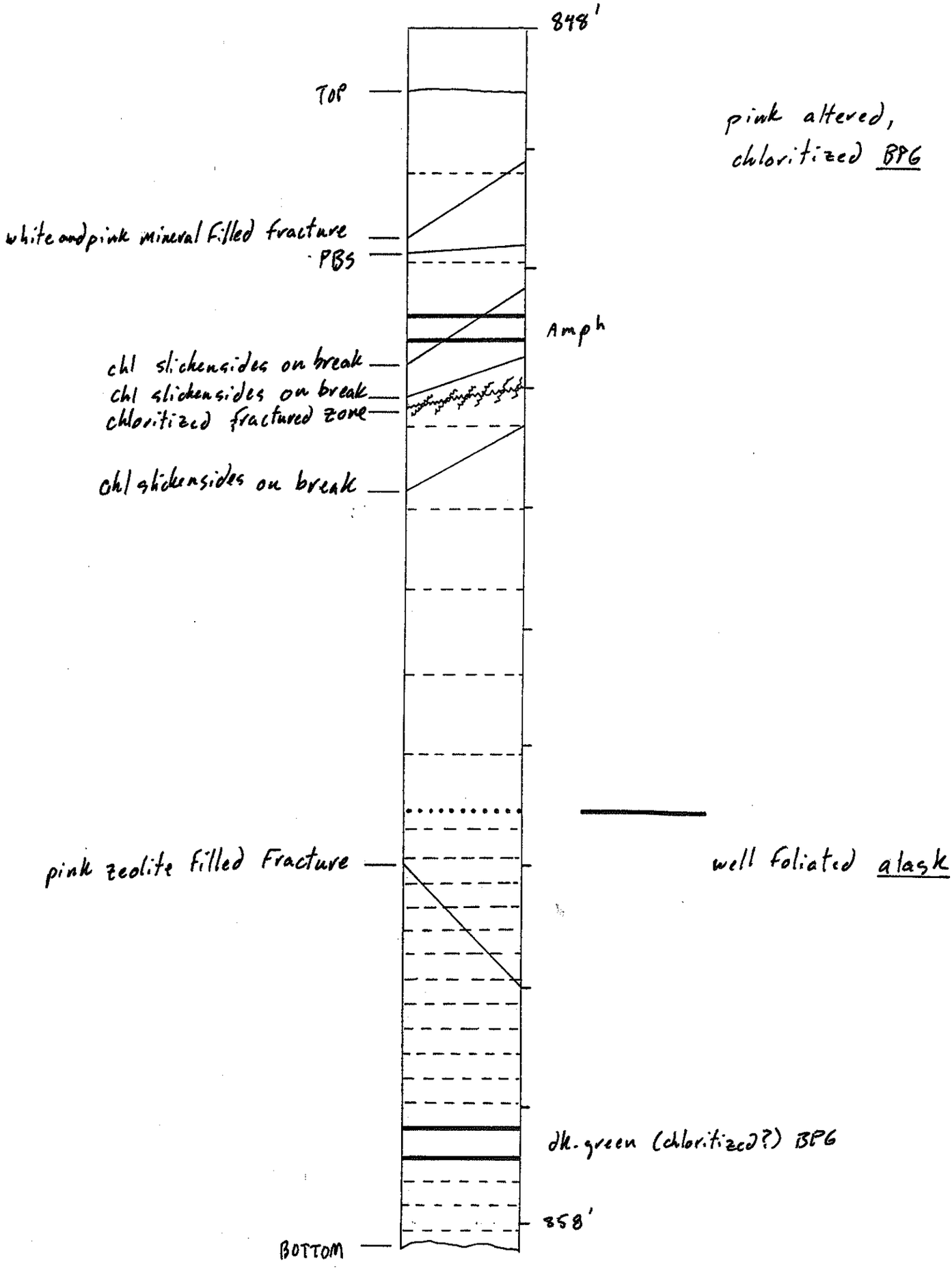


CORE LOG Gillette Castle BOX# 86 INTERVAL 839.1'-848.5'

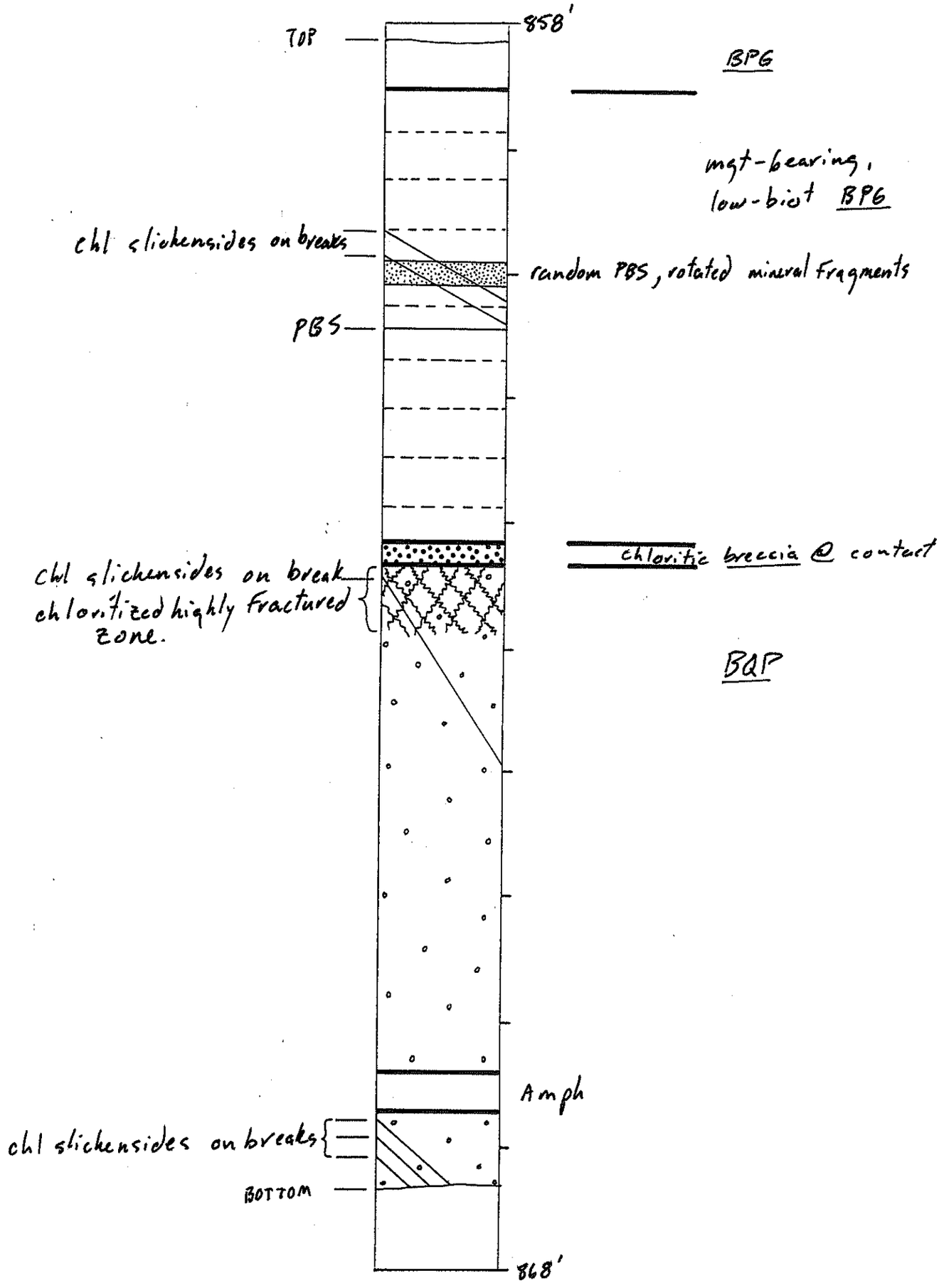


v. minor hbl-bearing BPG, variably layered and foliated.

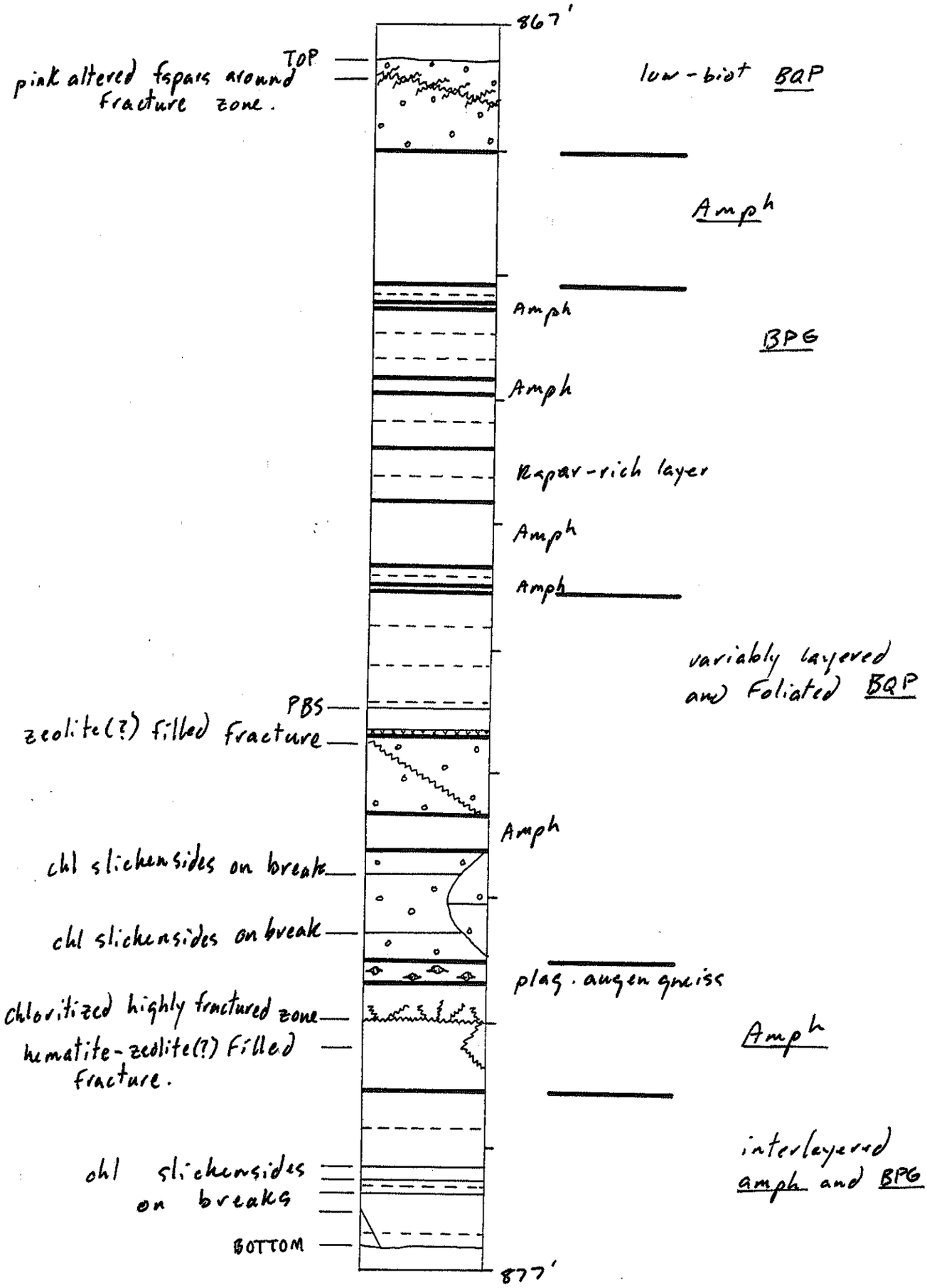
CORE LOG Gillette Castle BOX# 87 INTERVAL 848.5' - 858.1'



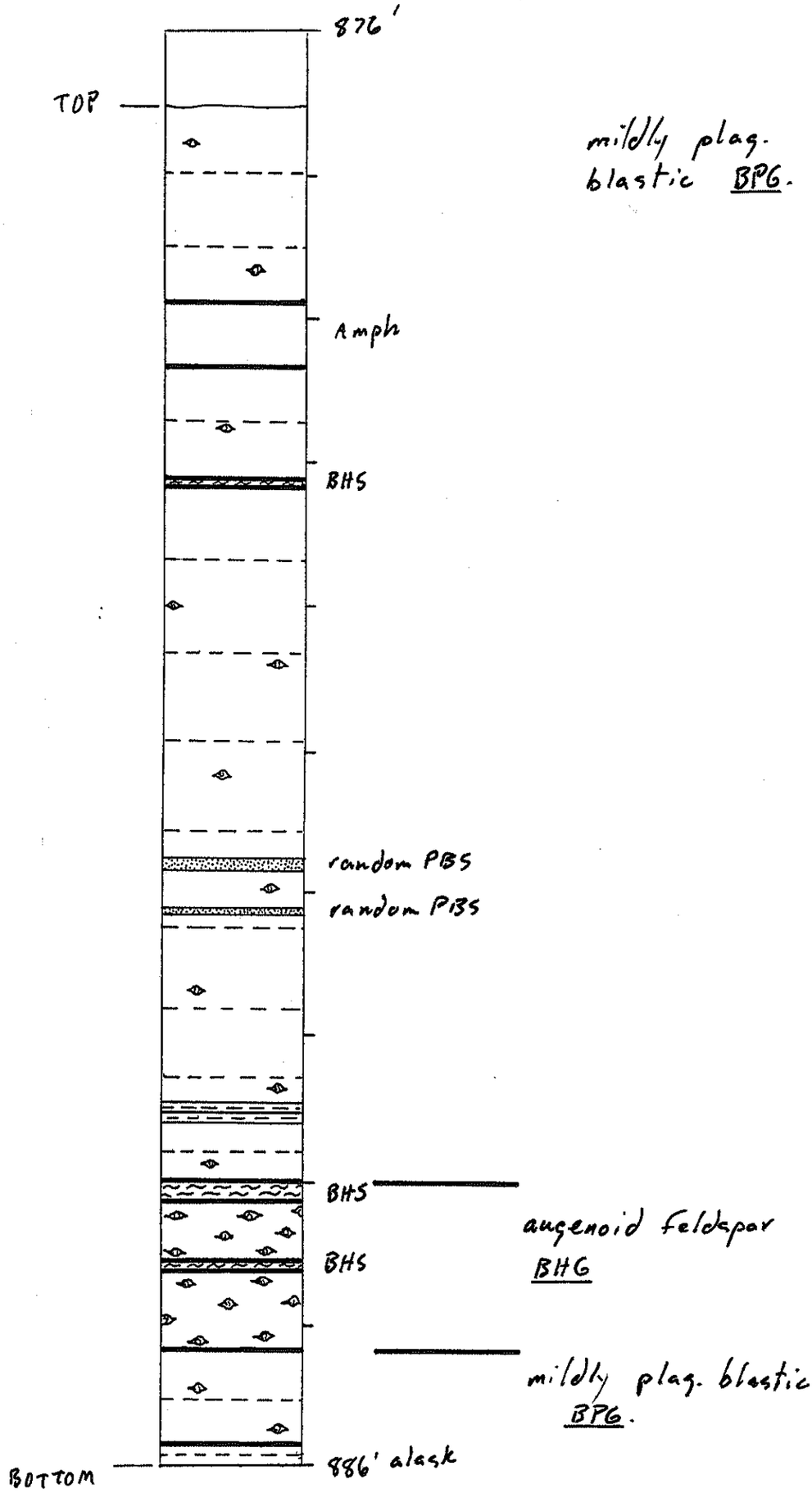
CORE LOG Gillette Castle BOX# 88 INTERVAL 858.1' - 867.5'



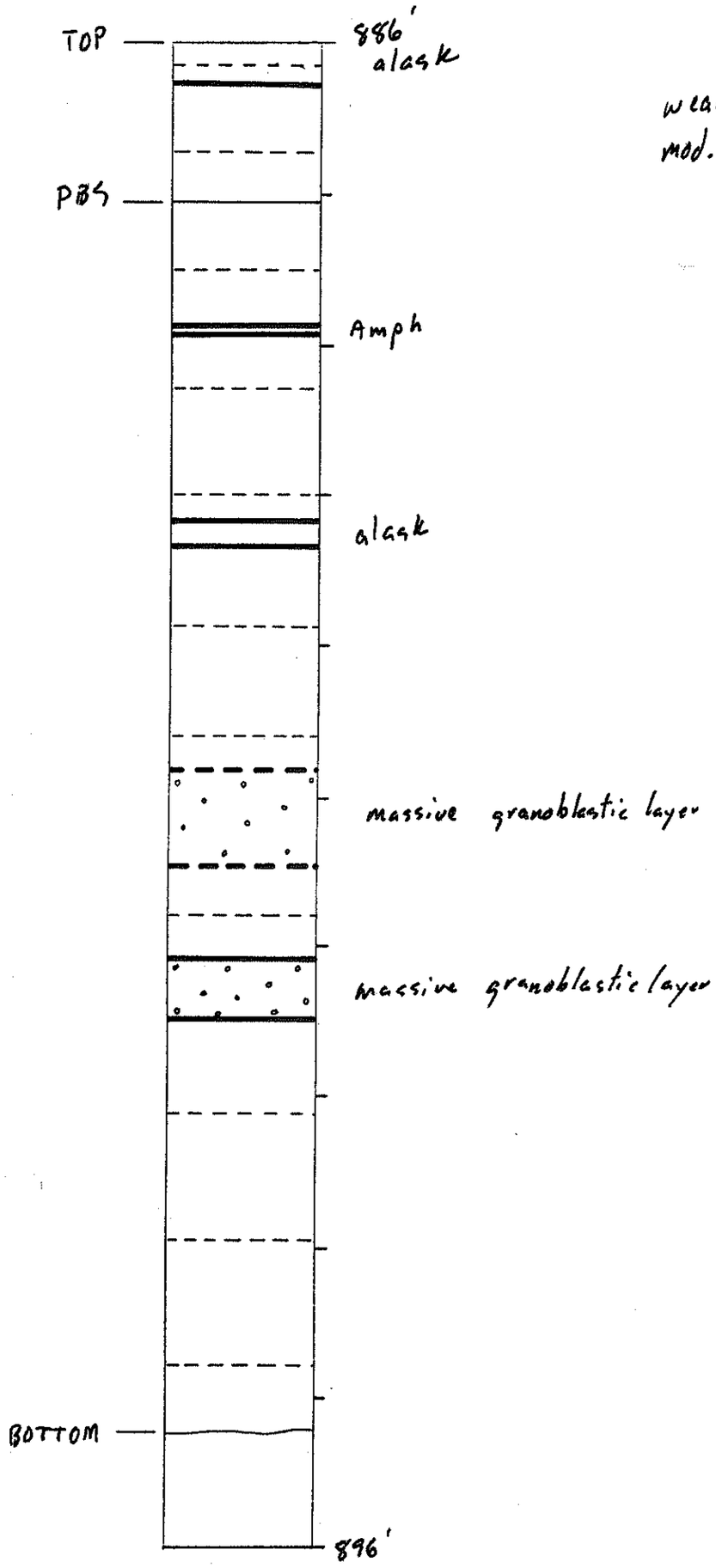
CORE LOG Gillette Castle BOX# 89 INTERVAL 867.5' - 876.5'



CORE LOG Gillette Castle BOX# 90 INTERVAL 876.5'-886.0'

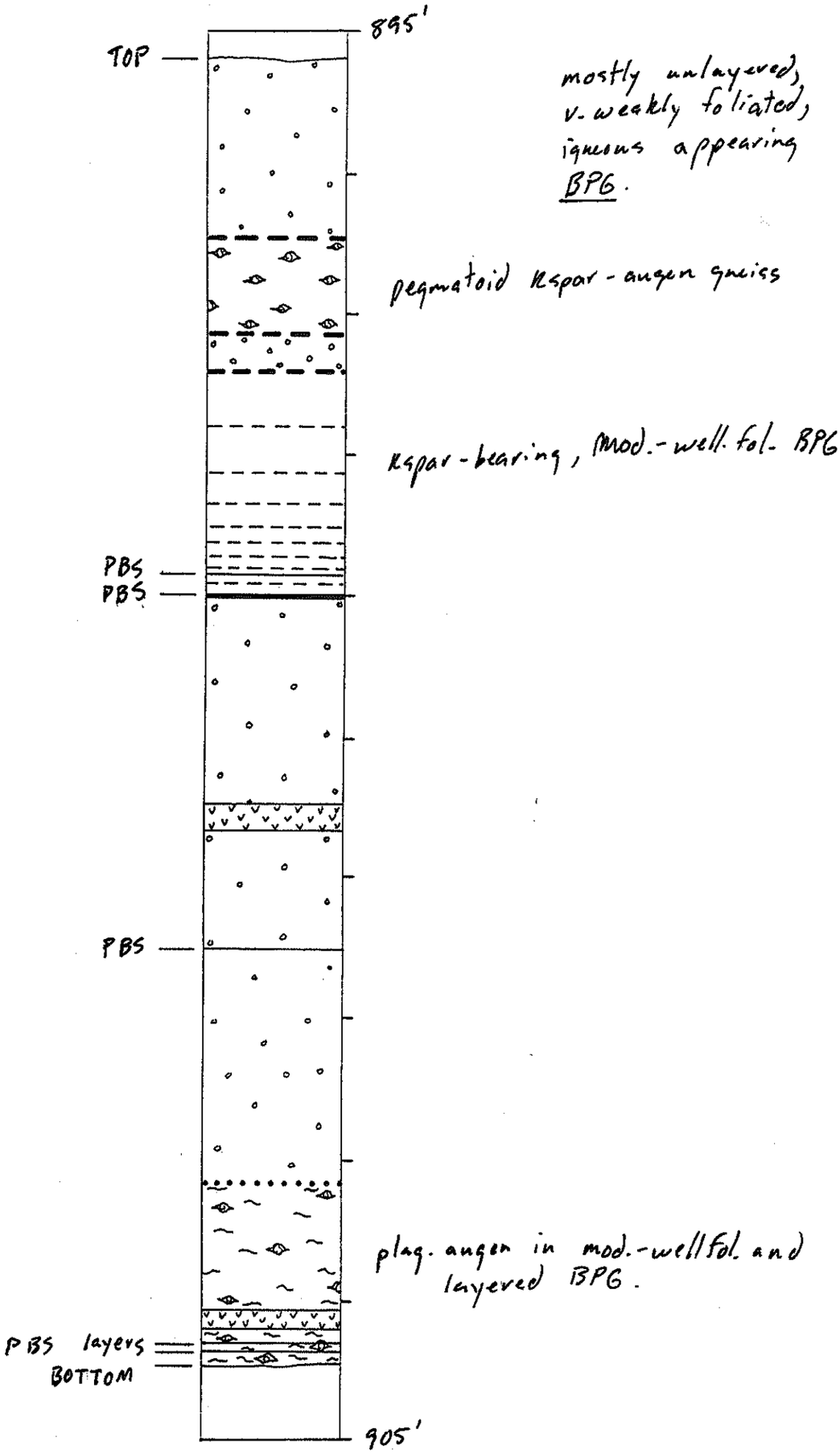


CORE LOG Gillette Castle BOX# 91 INTERVAL 886.0' - 895.2'

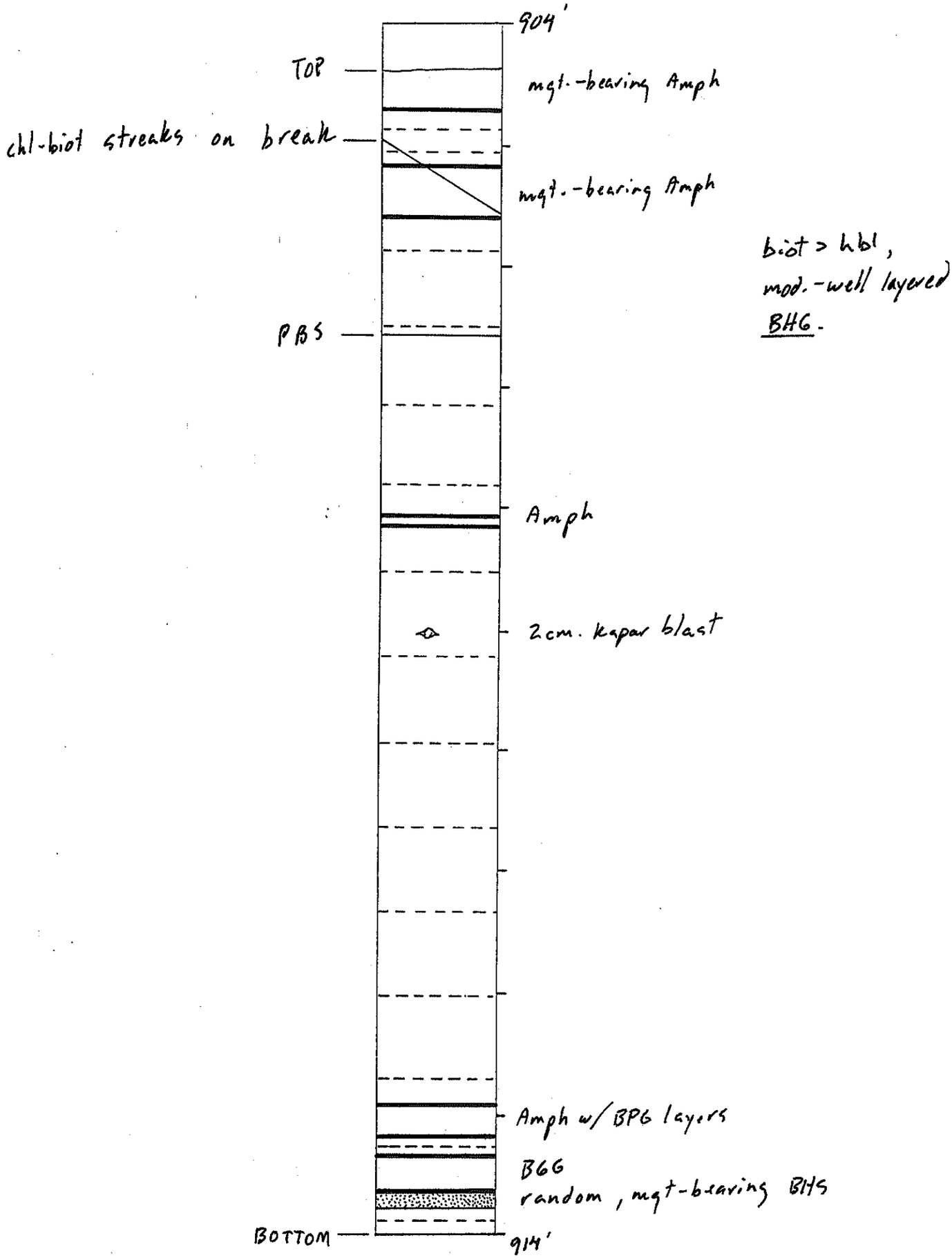


weakly layered, mod. fol. BPG

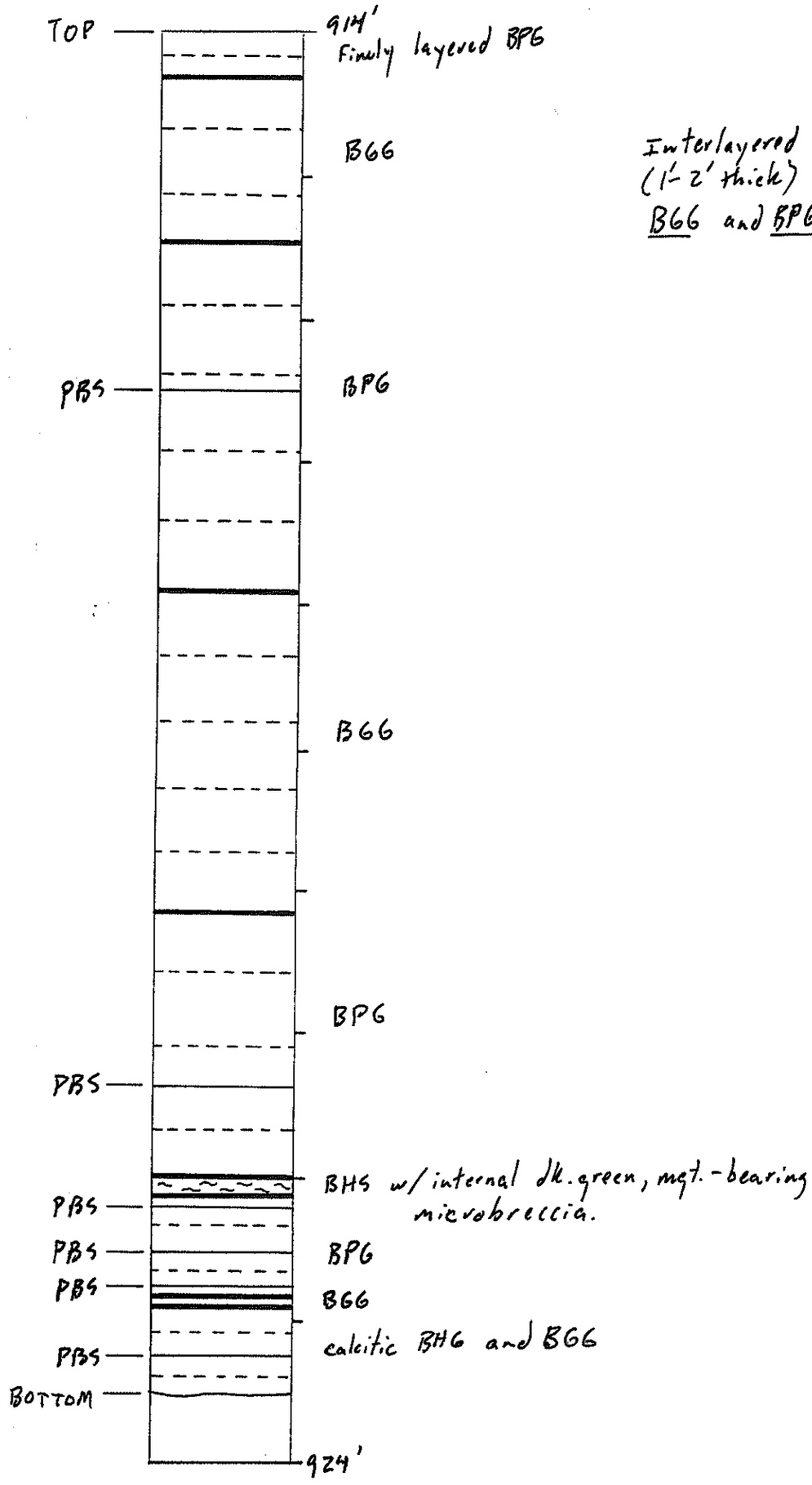
CORE LOG Gillette Castle BOX# 92 INTERVAL 895.2'-904.4'



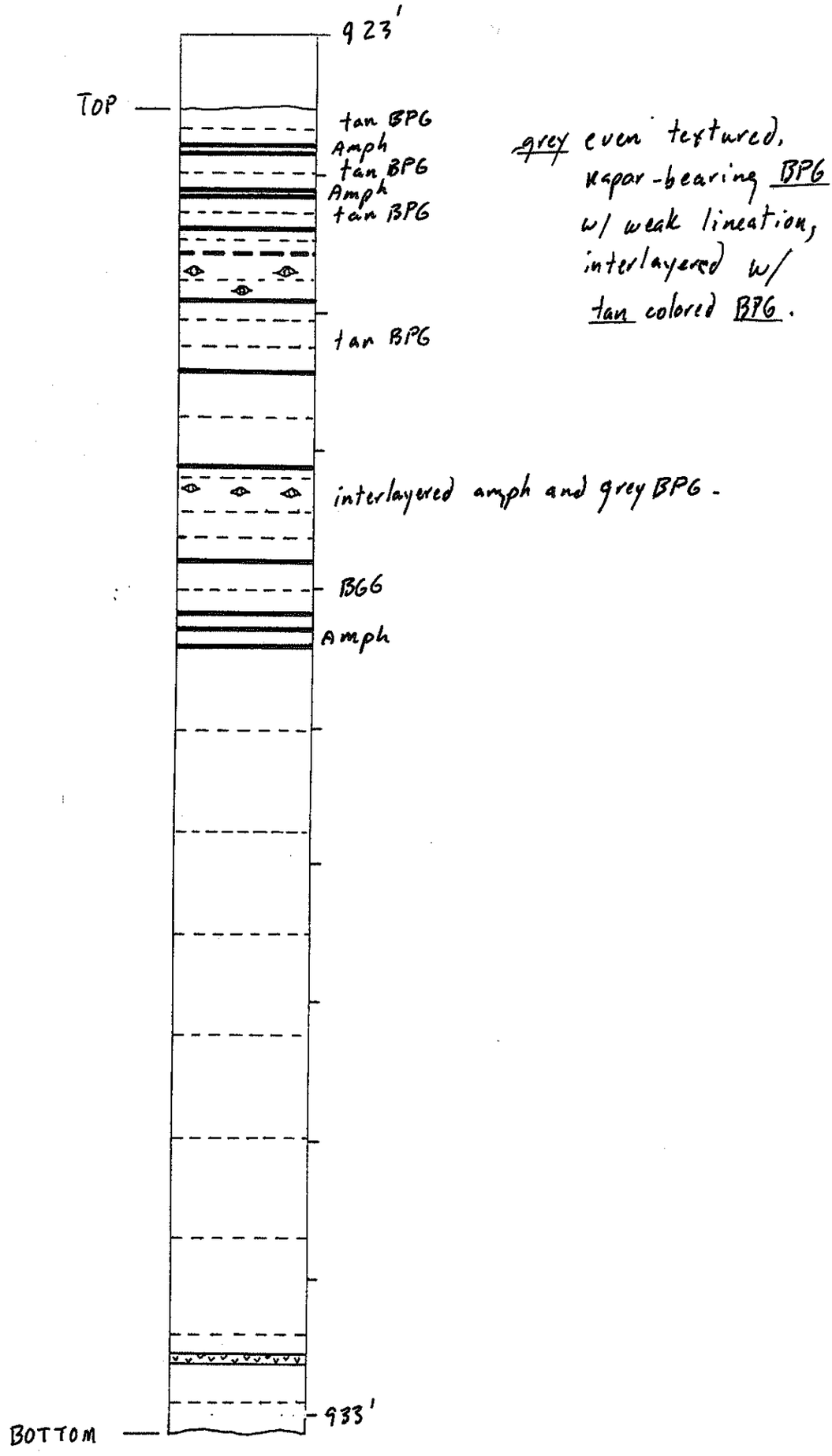
CORE LOG Gillette Castle BOX# 93 INTERVAL 904.4' - 914.0'



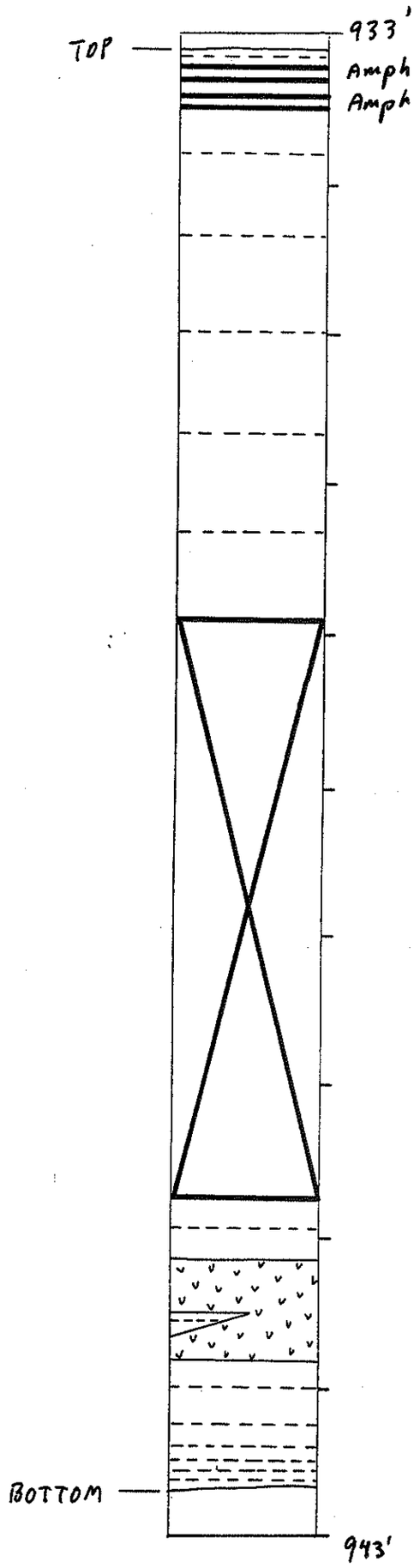
CORE LOG Gillette Castle BOX# 94 INTERVAL 914.0' - 923.5'



CORE LOG Gillette Castle BOX# 95 INTERVAL 923.5' - 933.1'

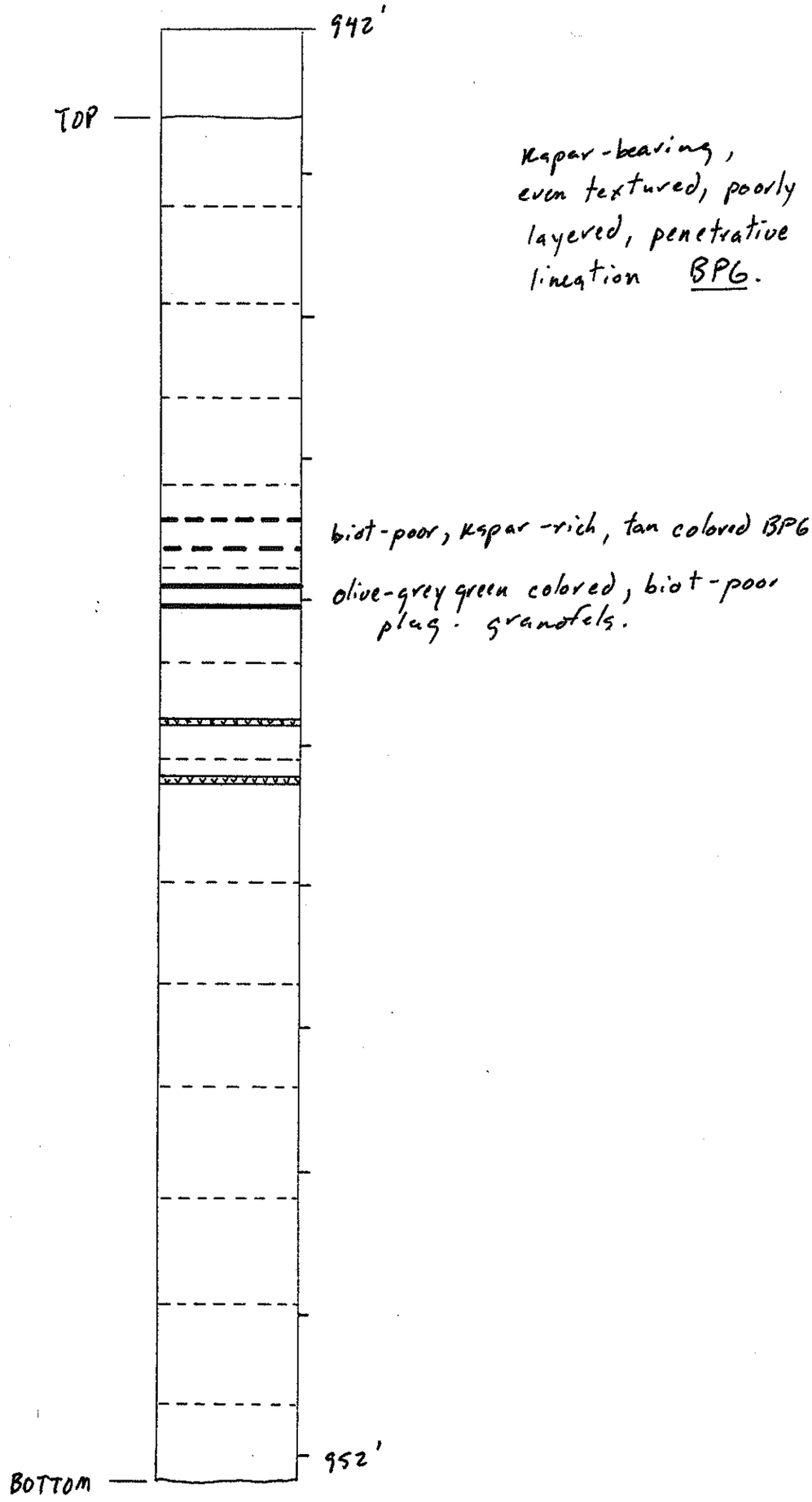


CORE LOG Gillette Castle BOX# 96 INTERVAL 933.1'- 942.7'

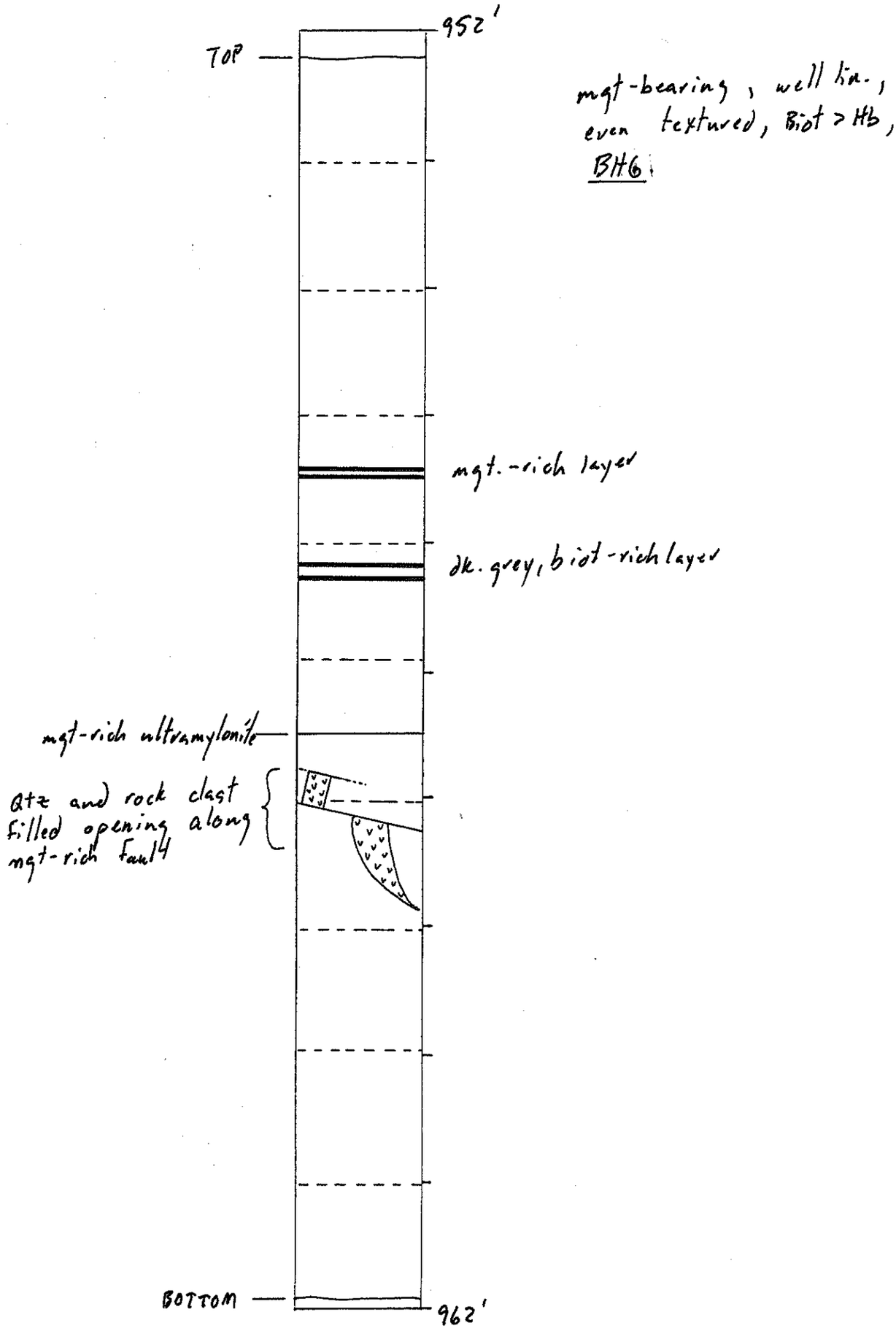


even textured,
poorly layered
BPG

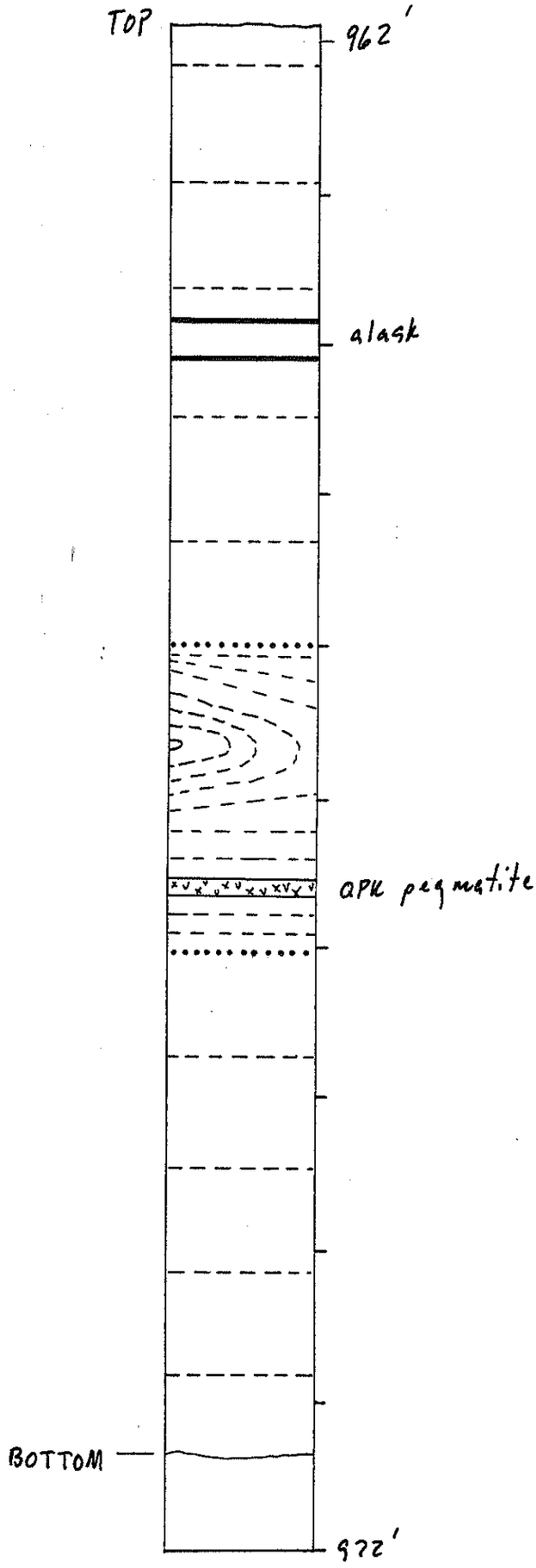
CORE LOG Gillette Castle BOX# 97 INTERVAL 942.7' - 952.2'



CORE LOG Gillette Castle BOX# 98 INTERVAL 952.2'-961.9'

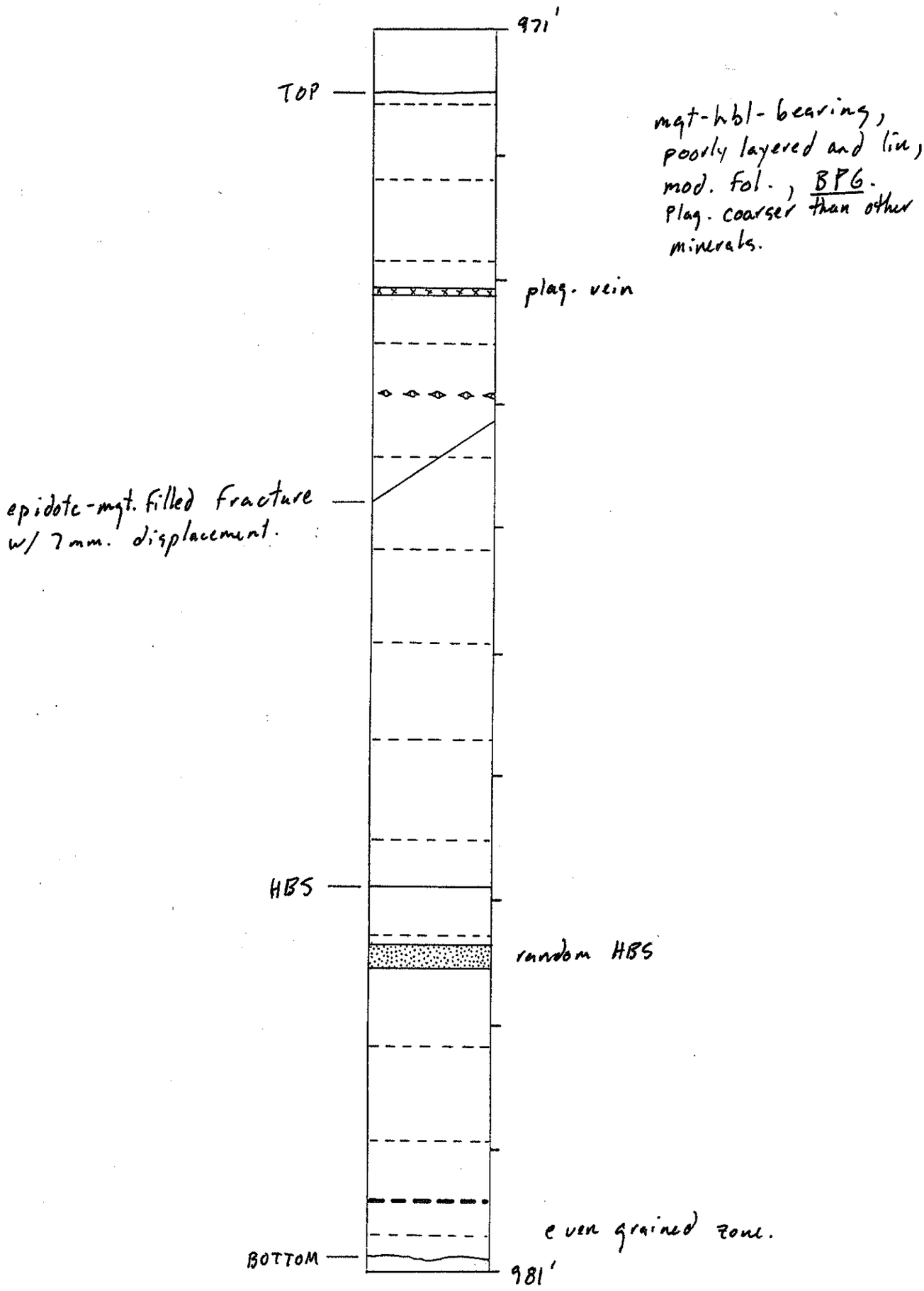


CORE LOG Gillette Castle BOX# 99 INTERVAL 961.9' - 971.4'

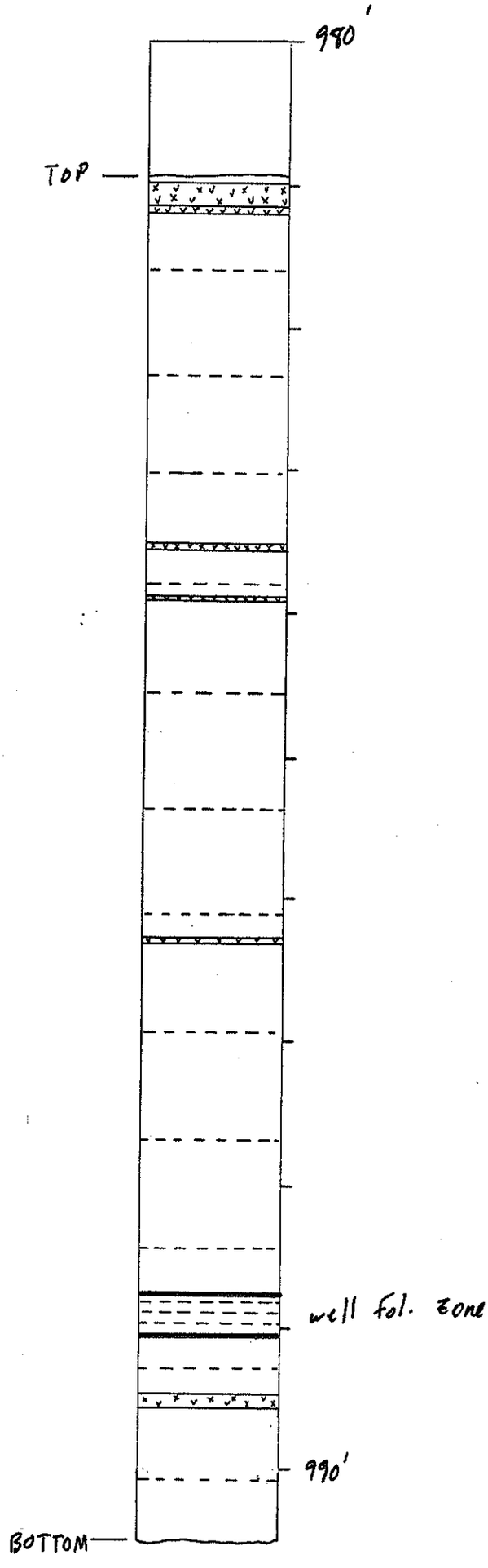


even textured,
penetrative lineation,
weakly layered,
biot > hbl, BHG

CORE LOG Gillette Castle BOX# 100 INTERVAL 971.4' - 980.9'

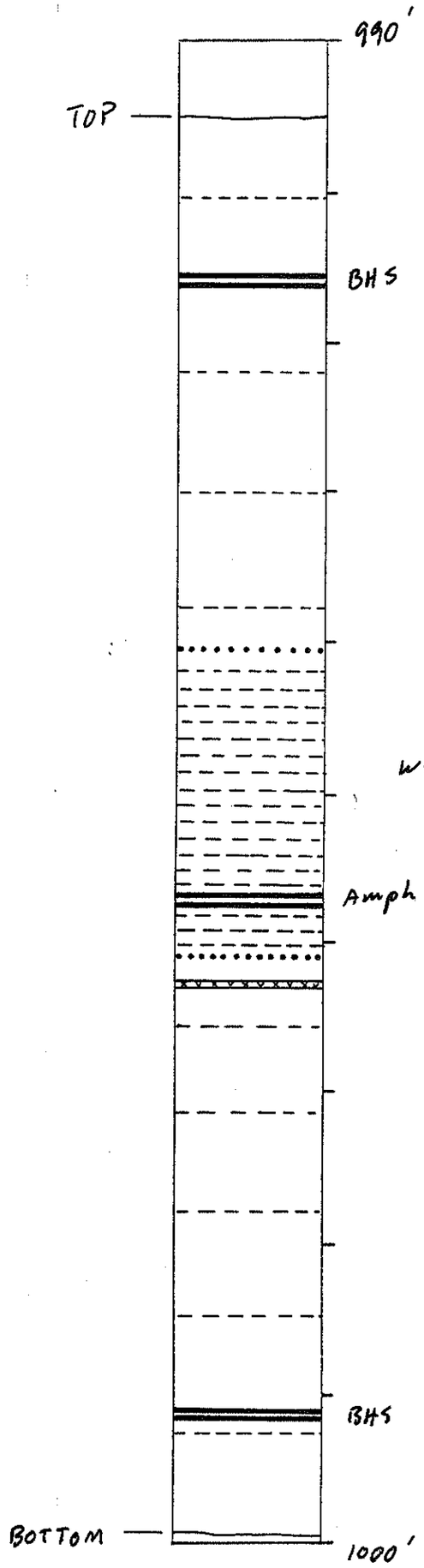


CORE LOG Gillette Castle BOX# 101 INTERVAL 980.9' - 990.5'



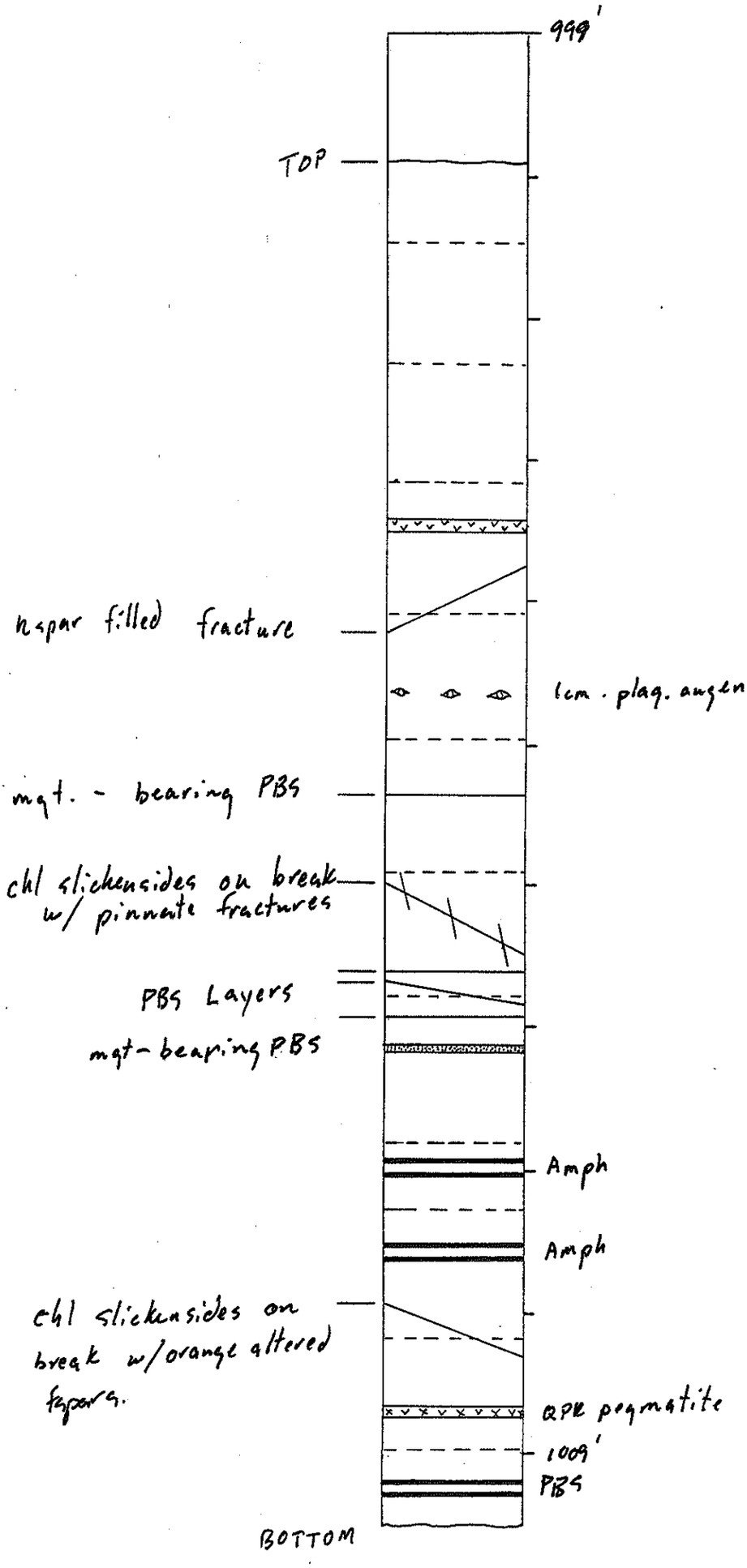
well fol. and layered, kspar-bearing BHG.

CORE LOG Gillette Castle BOX# 102 INTERVAL 990.5'-999.9'



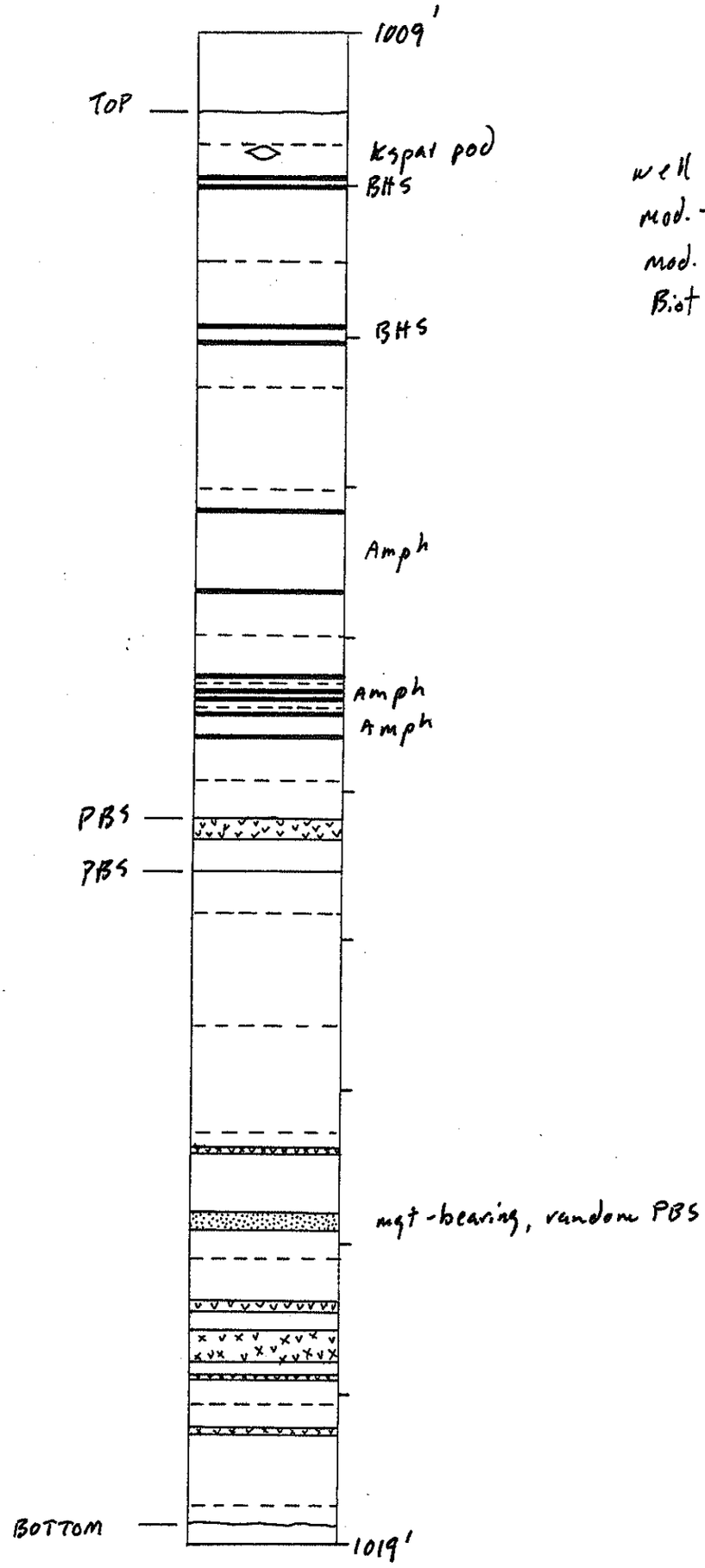
mod. fol. and layered, Kspar-bearing, BHG.

CORE LOG Gillette Castle BOX# 103 INTERVAL 999.9' - 1009.5'



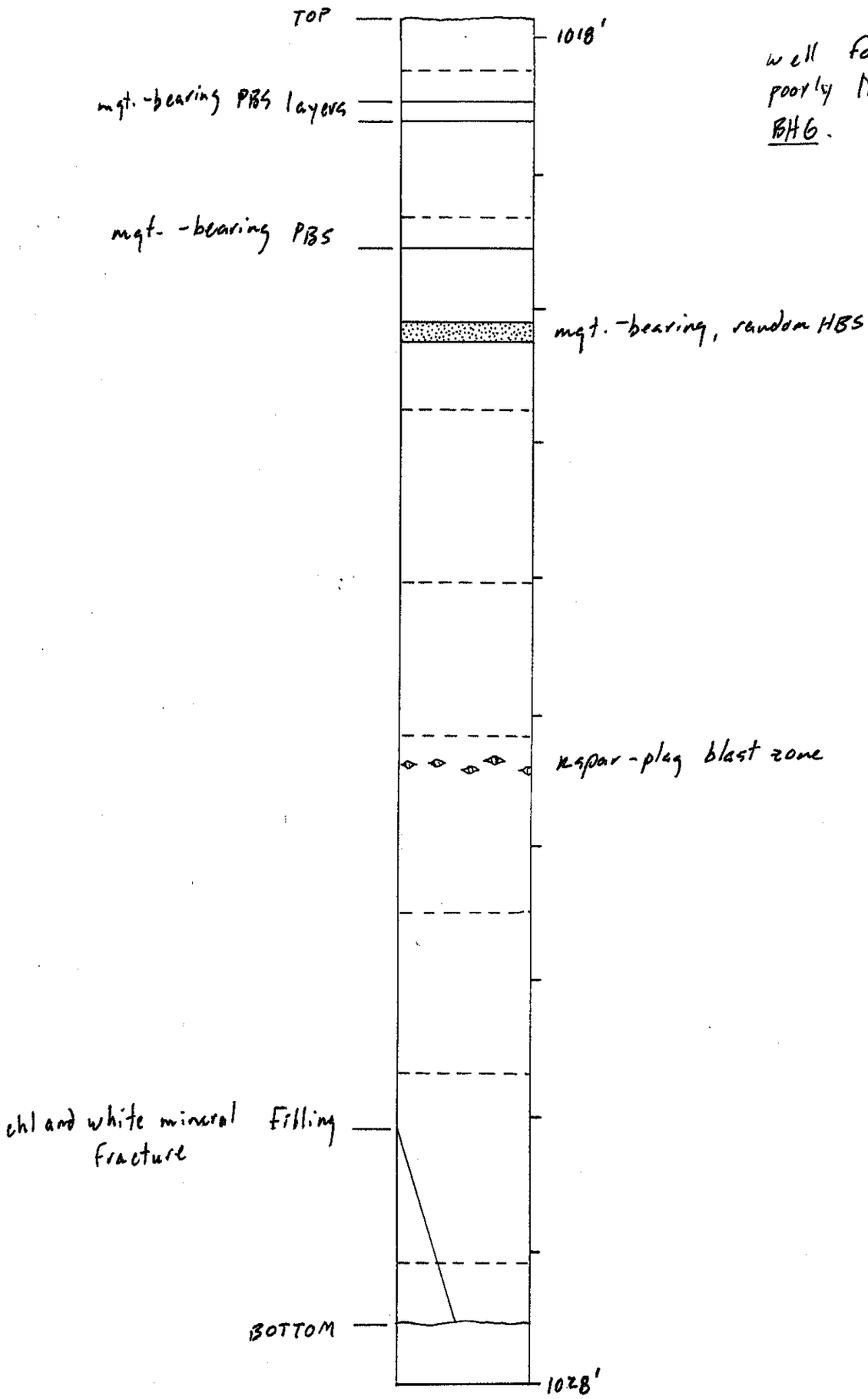
mgt-bearing, mod. fol, weak penetrative lin, mod. layered, hbl > biot BHG.

CORE LOG Gillette Castle BOX# 104 INTERVAL 1009.5' - 1018.9'



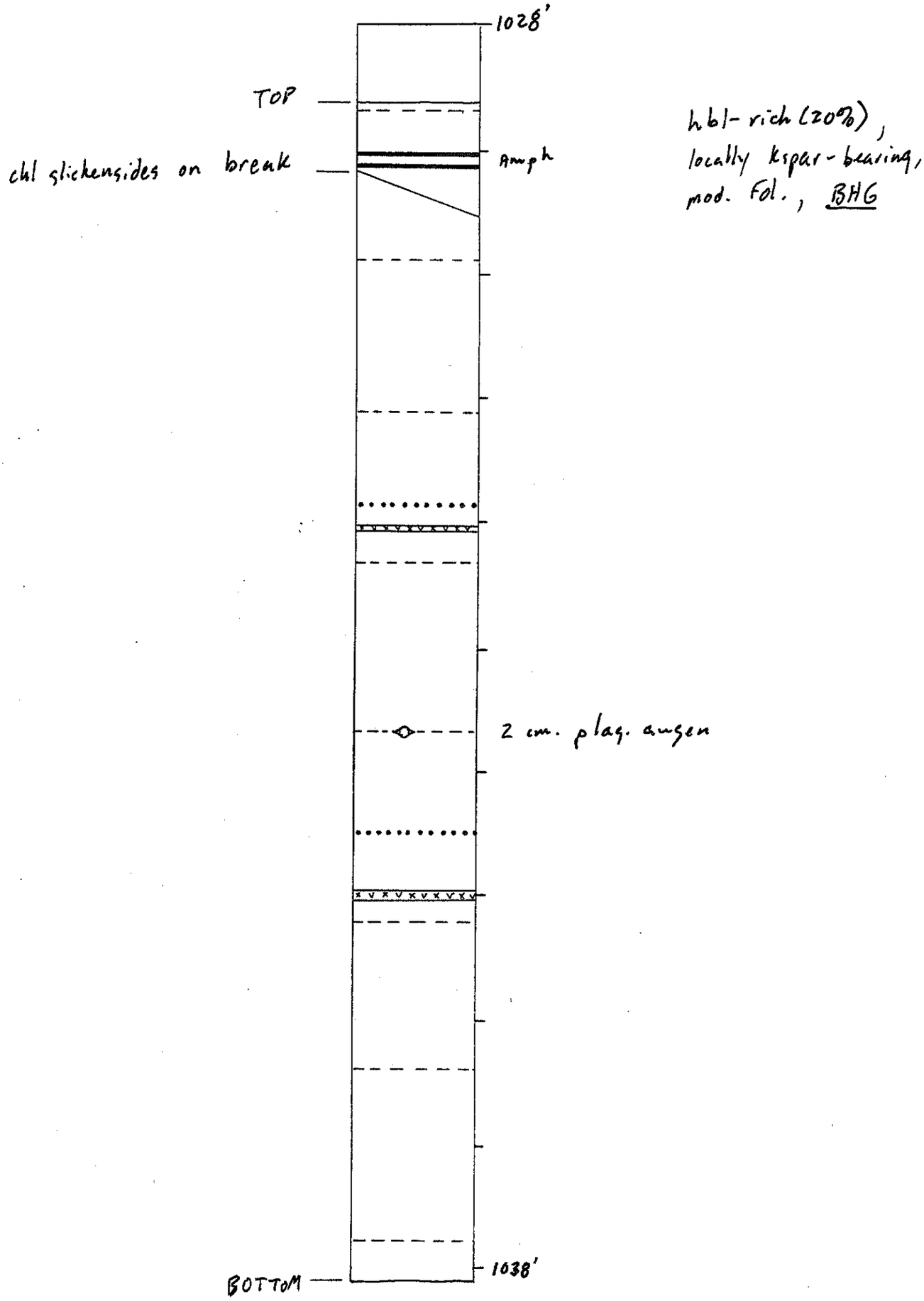
well layered,
mod.-well fol.,
mod. lin.,
Biot > hbl BHG.

CORE LOG Gillette Castle BOX# 105 INTERVAL 1018.9'- 1028.6'

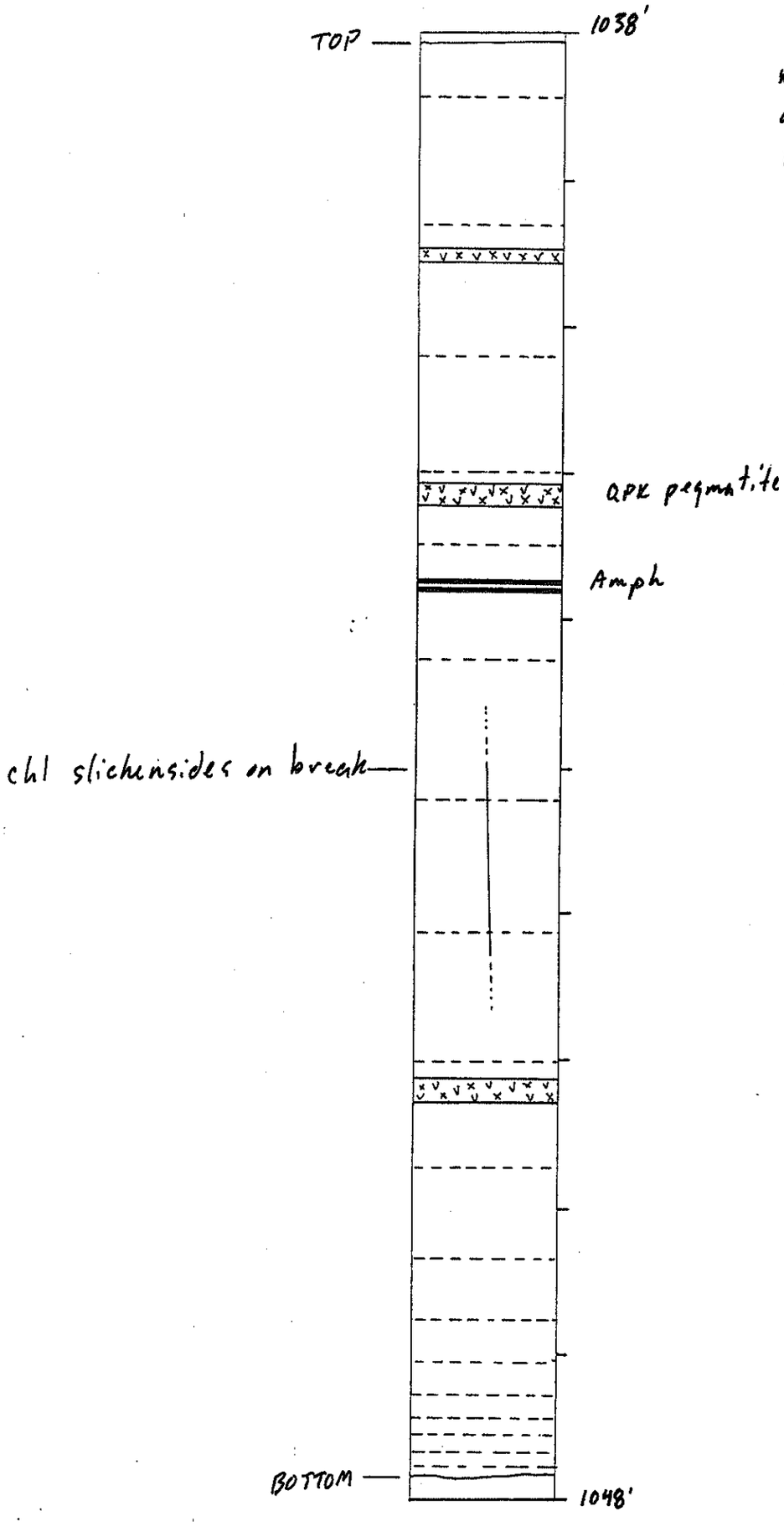


well fol., mod. lin., poorly layered, hbl>bio
BH6.

CORE LOG Gillette Castle BOX# 106 INTERVAL 1028.6' - 1038.1'

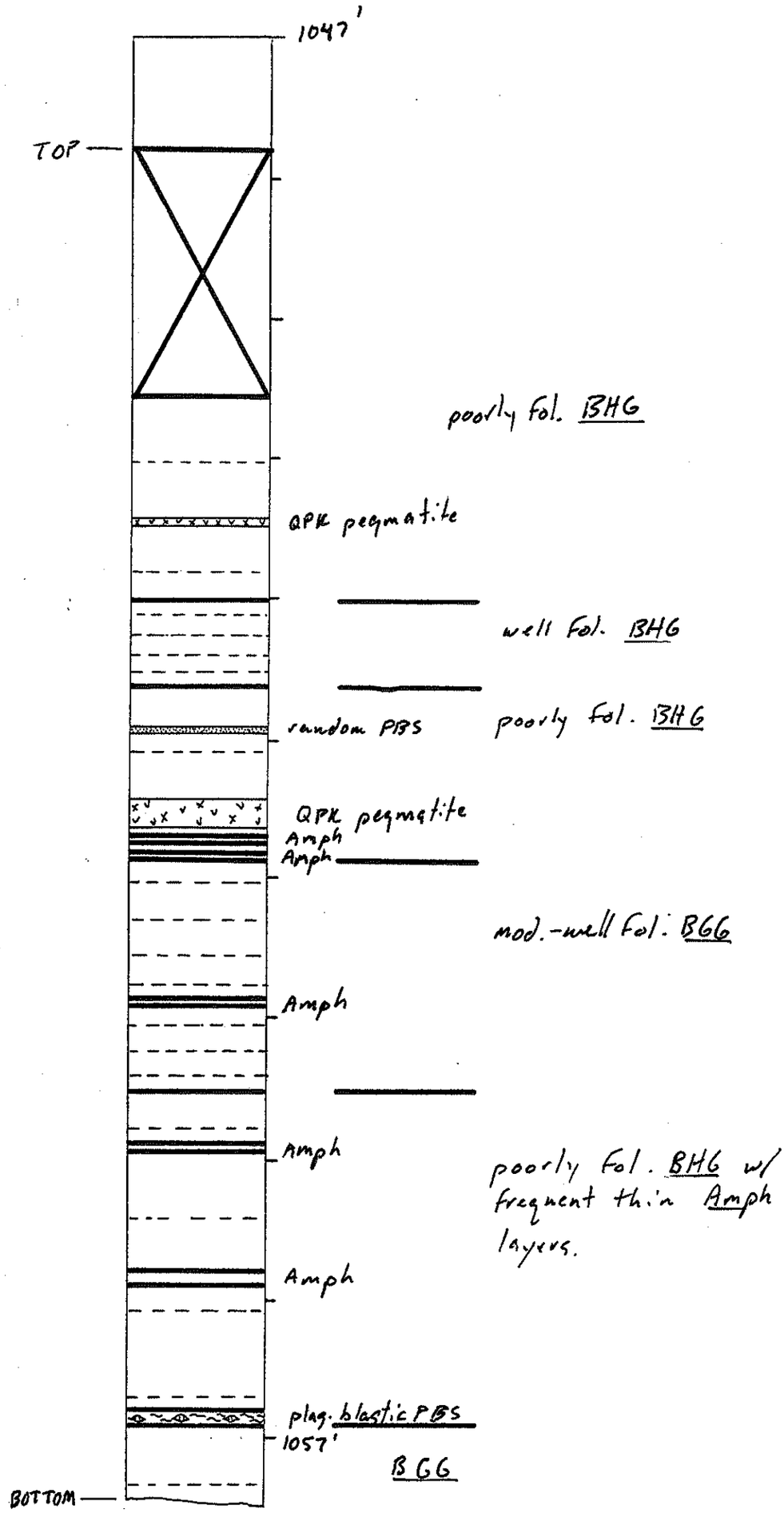


CORE LOG Gillette Castle BOX# 107 INTERVAL 1038.1' – 1047.8'

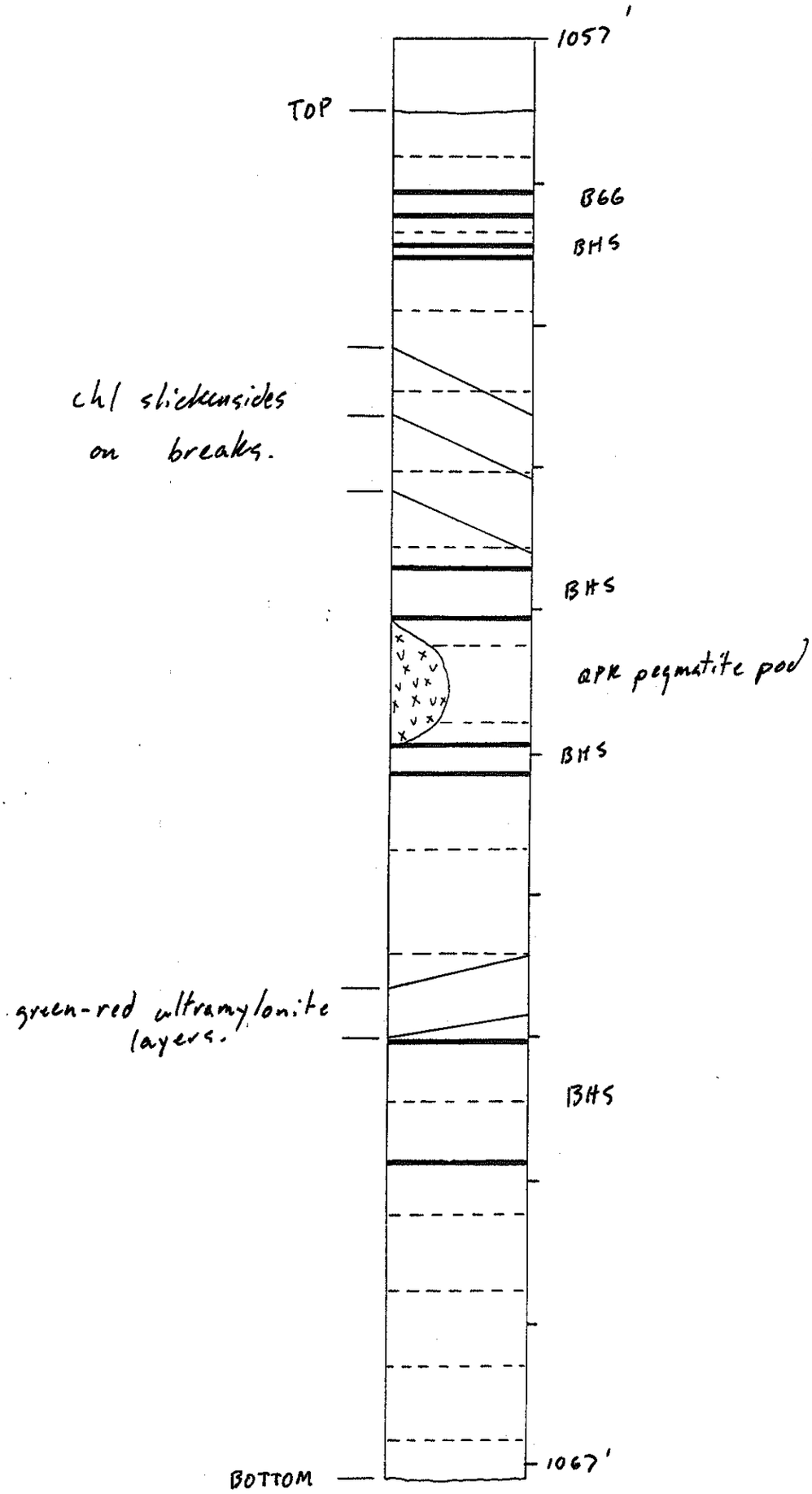


k spar-bearing, mod. fol. and layered (better toward bottom), biot = hbl BHG.

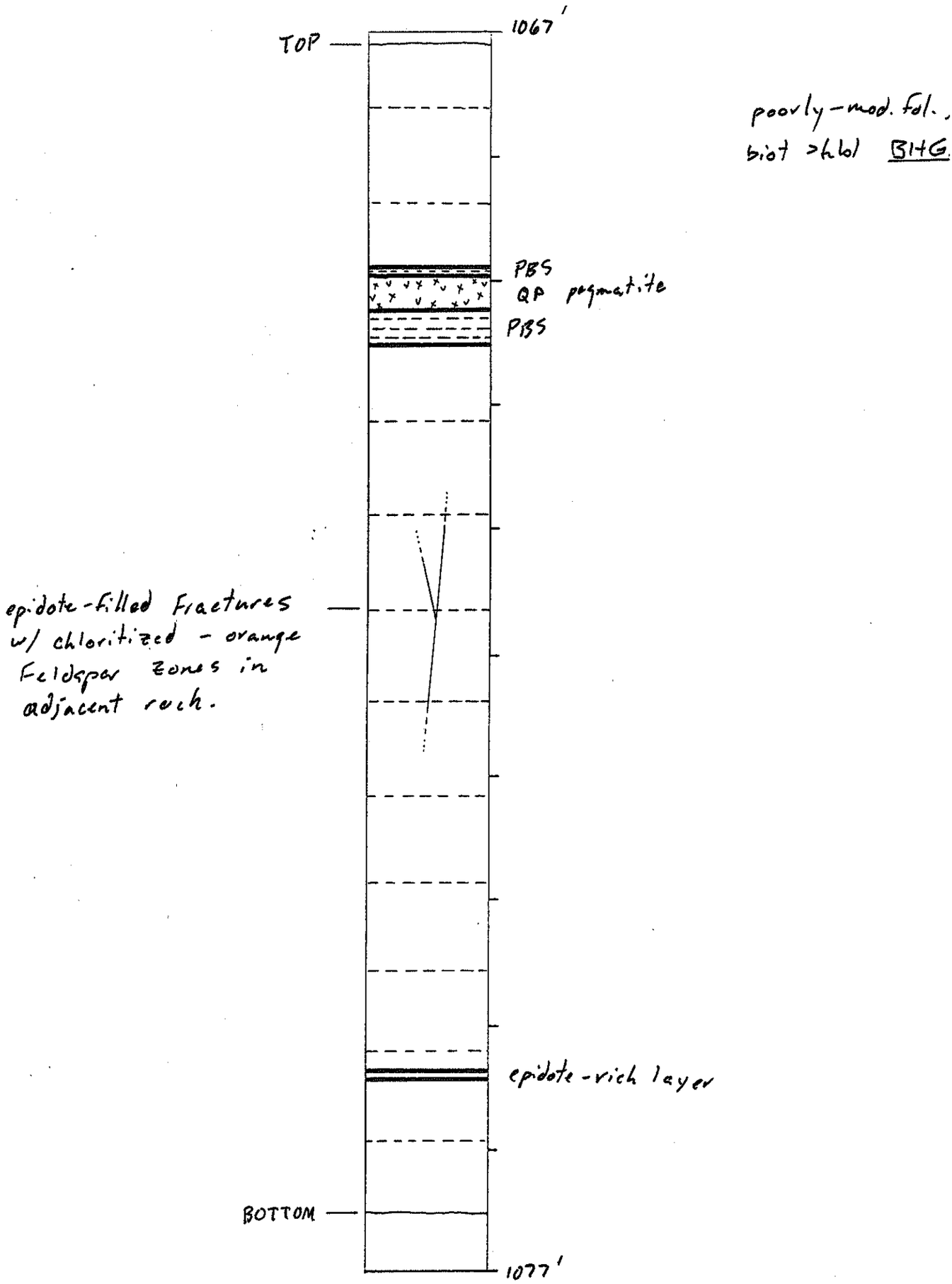
CORE LOG Gillette Castle BOX# 108 INTERVAL 1047.8' - 1057.5'



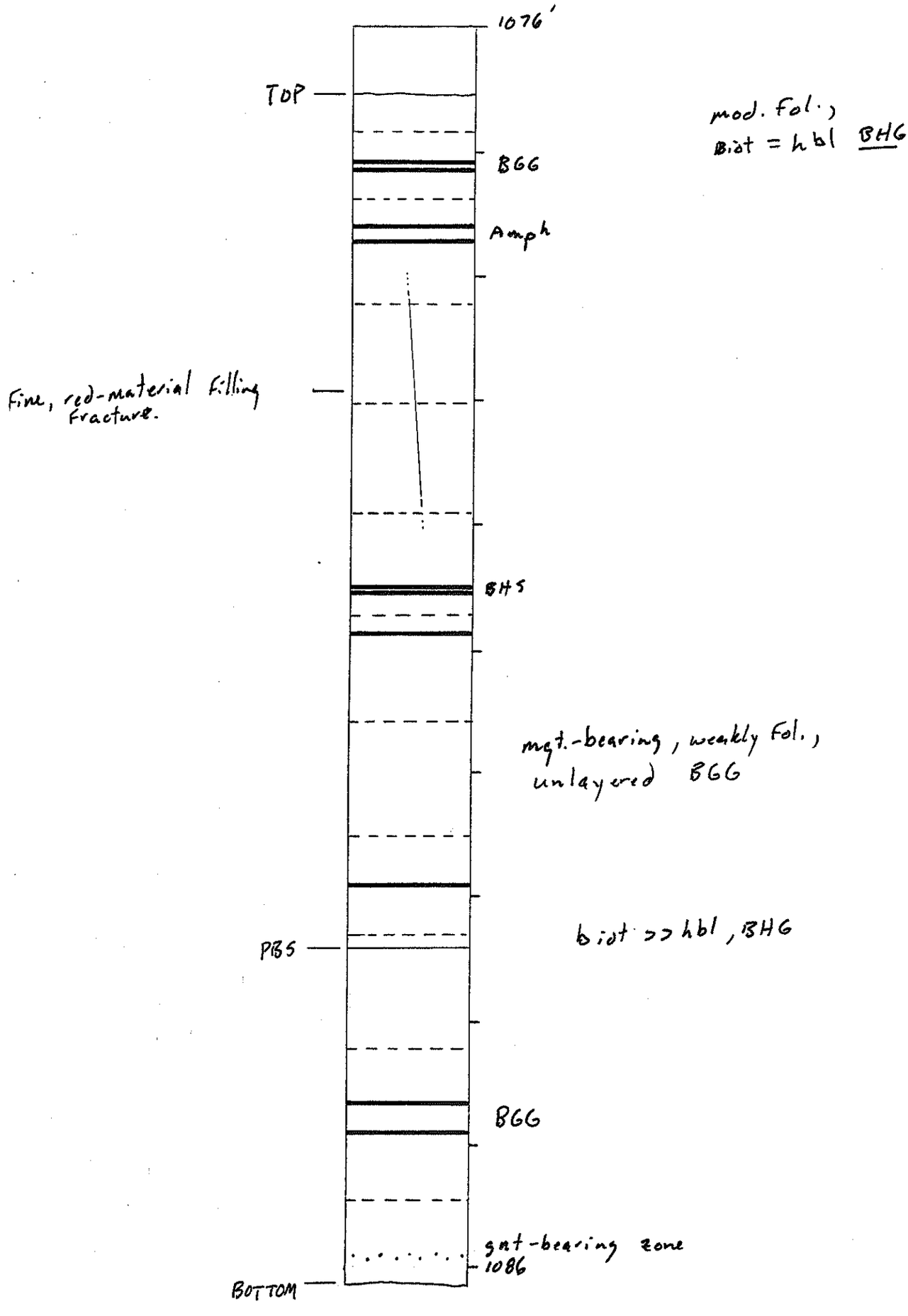
CORE LOG Gillette Castle BOX# 109 INTERVAL 1057.5' - 1067.1'



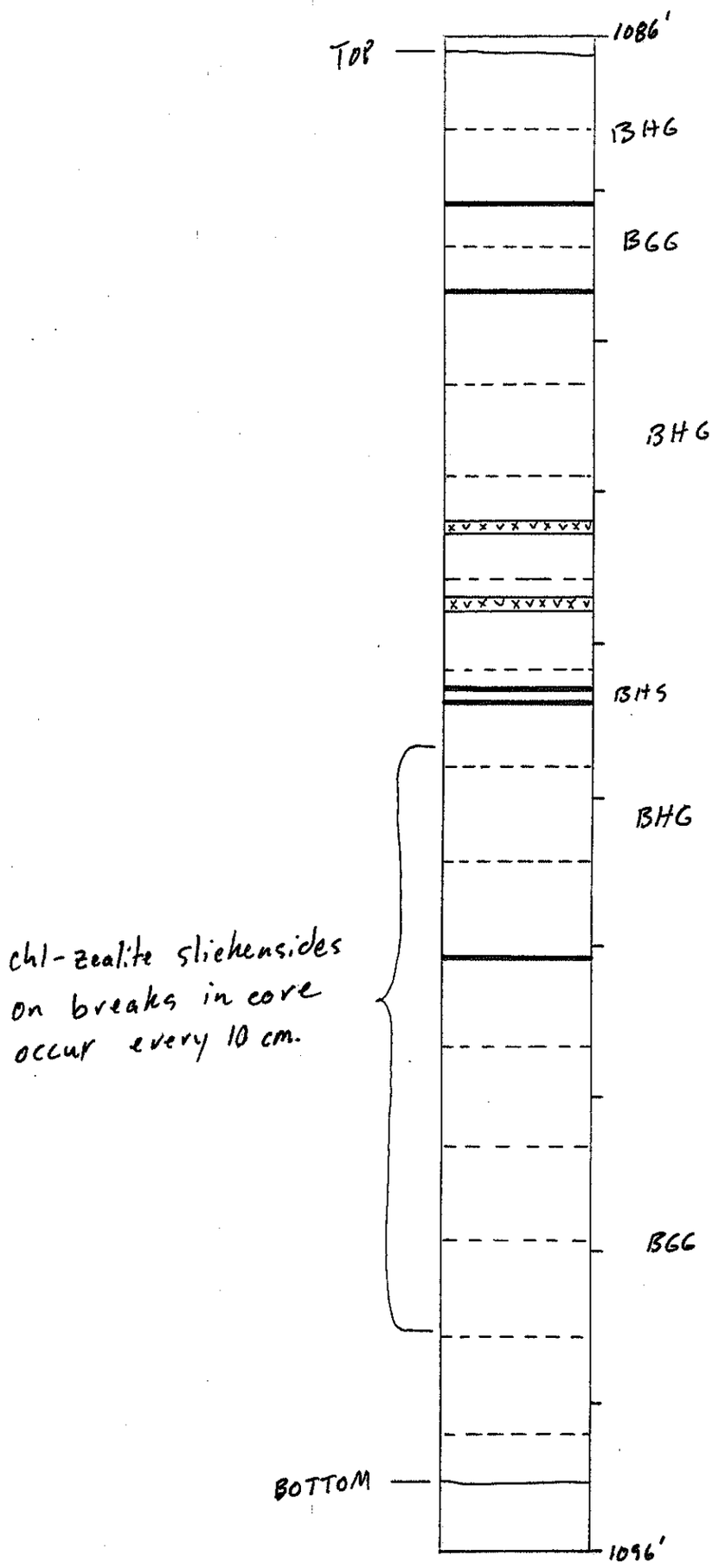
CORE LOG Gillette Castle BOX# 110 INTERVAL 1067.1' - 1076.6'



CORE LOG Gillette Castle BOX# 111 INTERVAL 1076.6' - 1086.2'

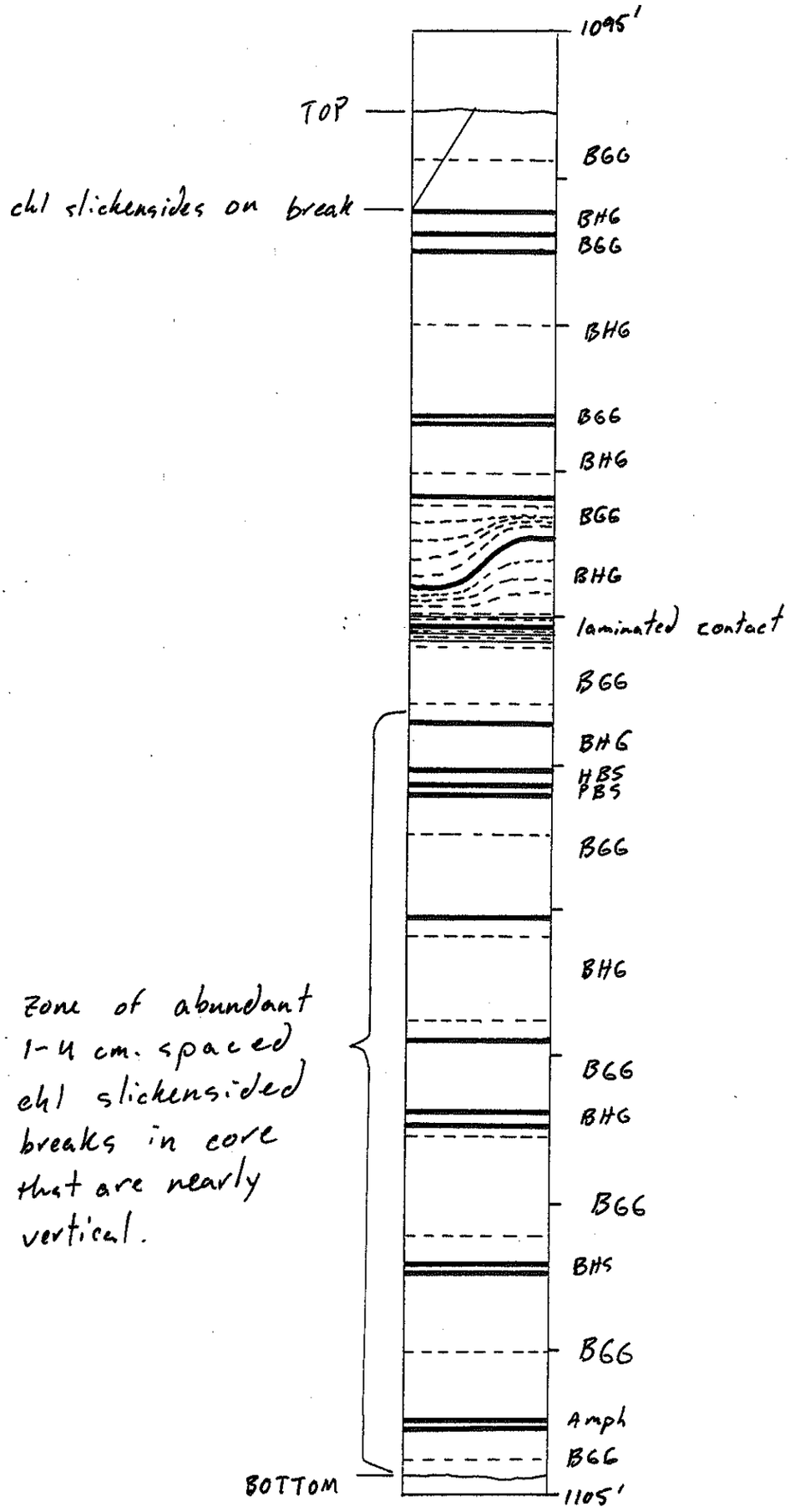


CORE LOG Gillette Castle BOX# 112 INTERVAL 1086.2' - 1095.6'

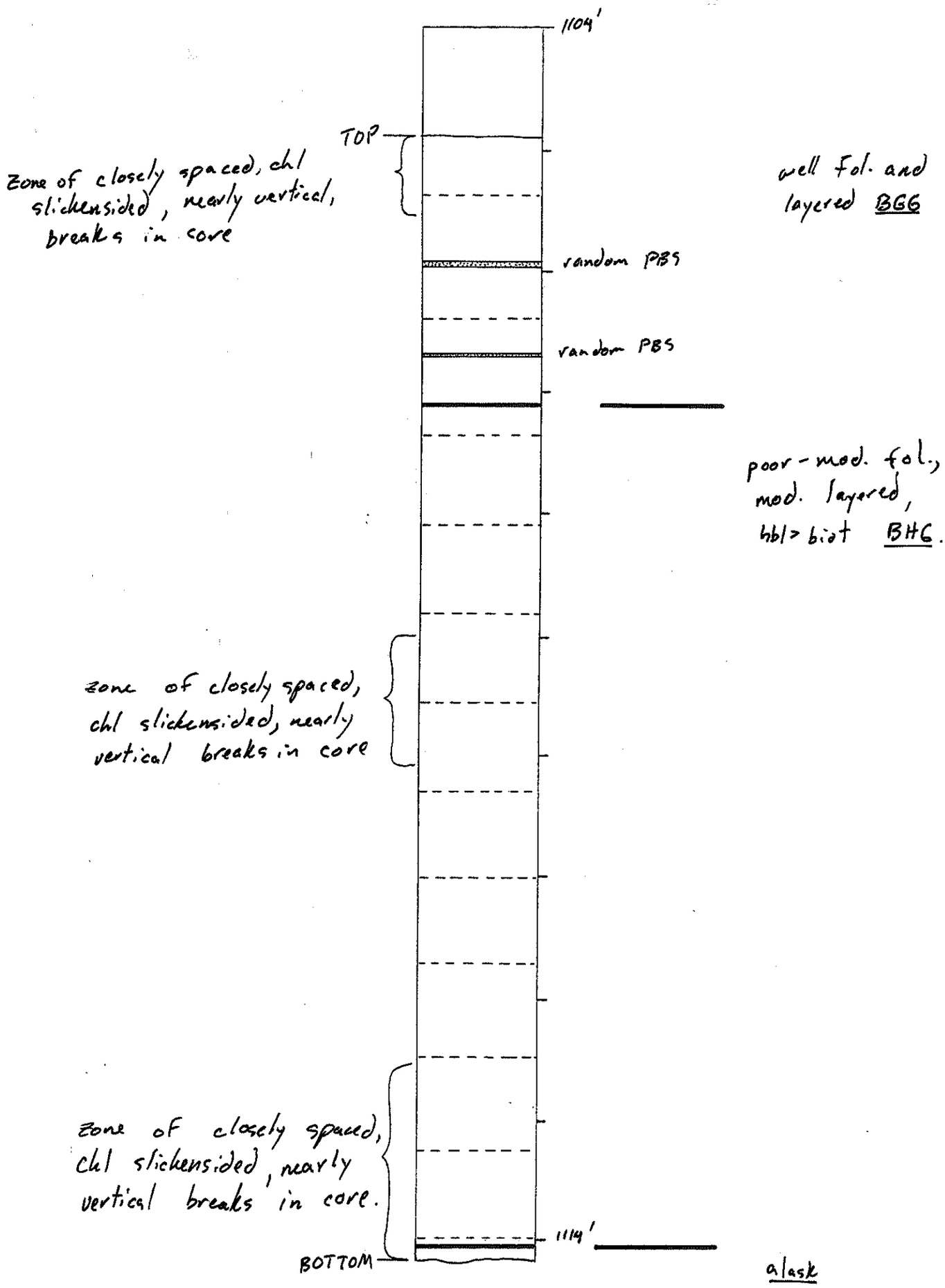


poorly layered and Fol., biot > hbl BHG and well foliated BGG.

CORE LOG Gillette Castle BOX# 113 INTERVAL 1095.6' - 1109.9'

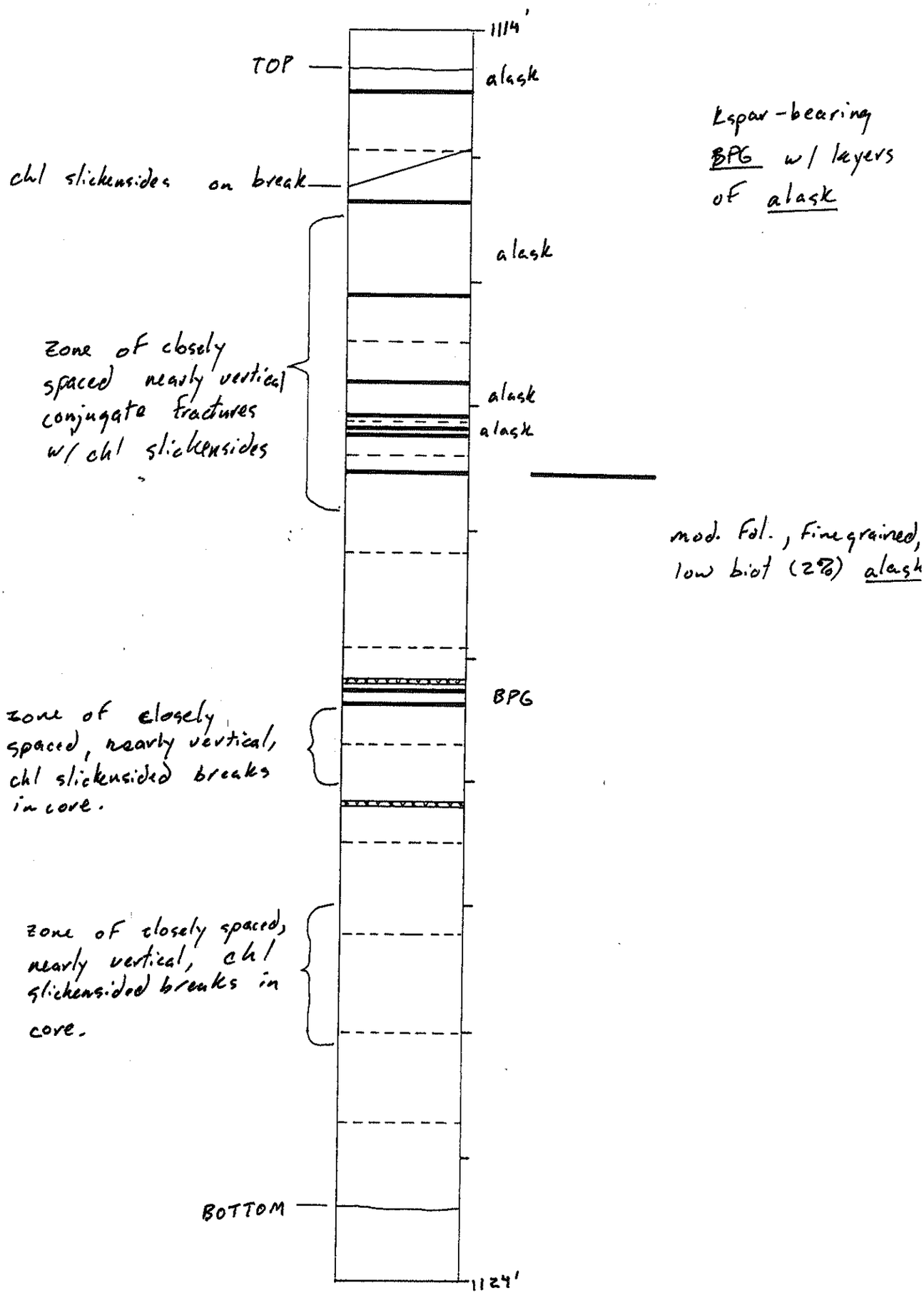


CORE LOG Gillette Castle BOX# 114 INTERVAL 1104.9' - 1114.3'

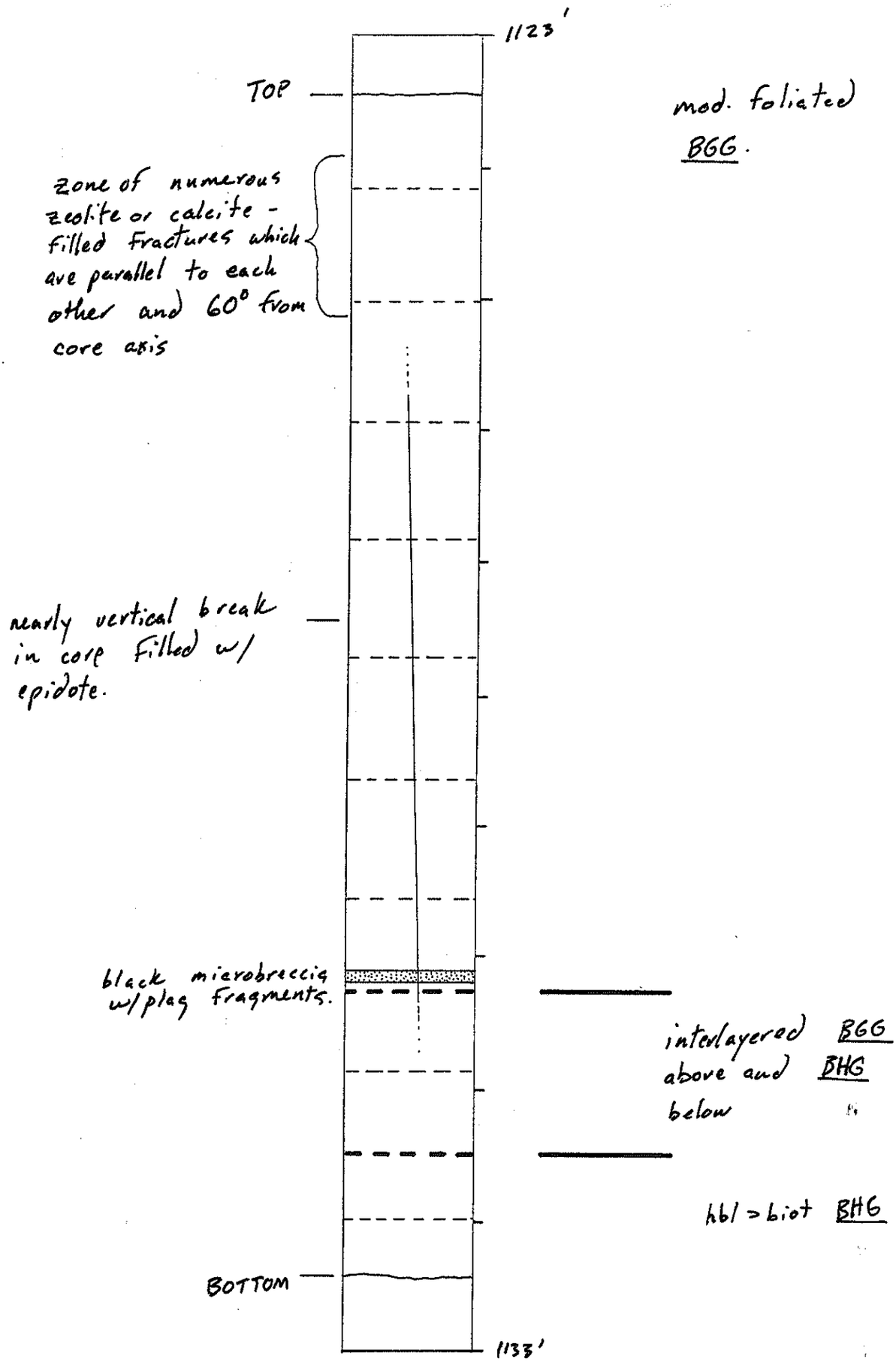


alask

CORE LOG Gillette Castle BOX# 115 INTERVAL 1114.3' - 1123.4'

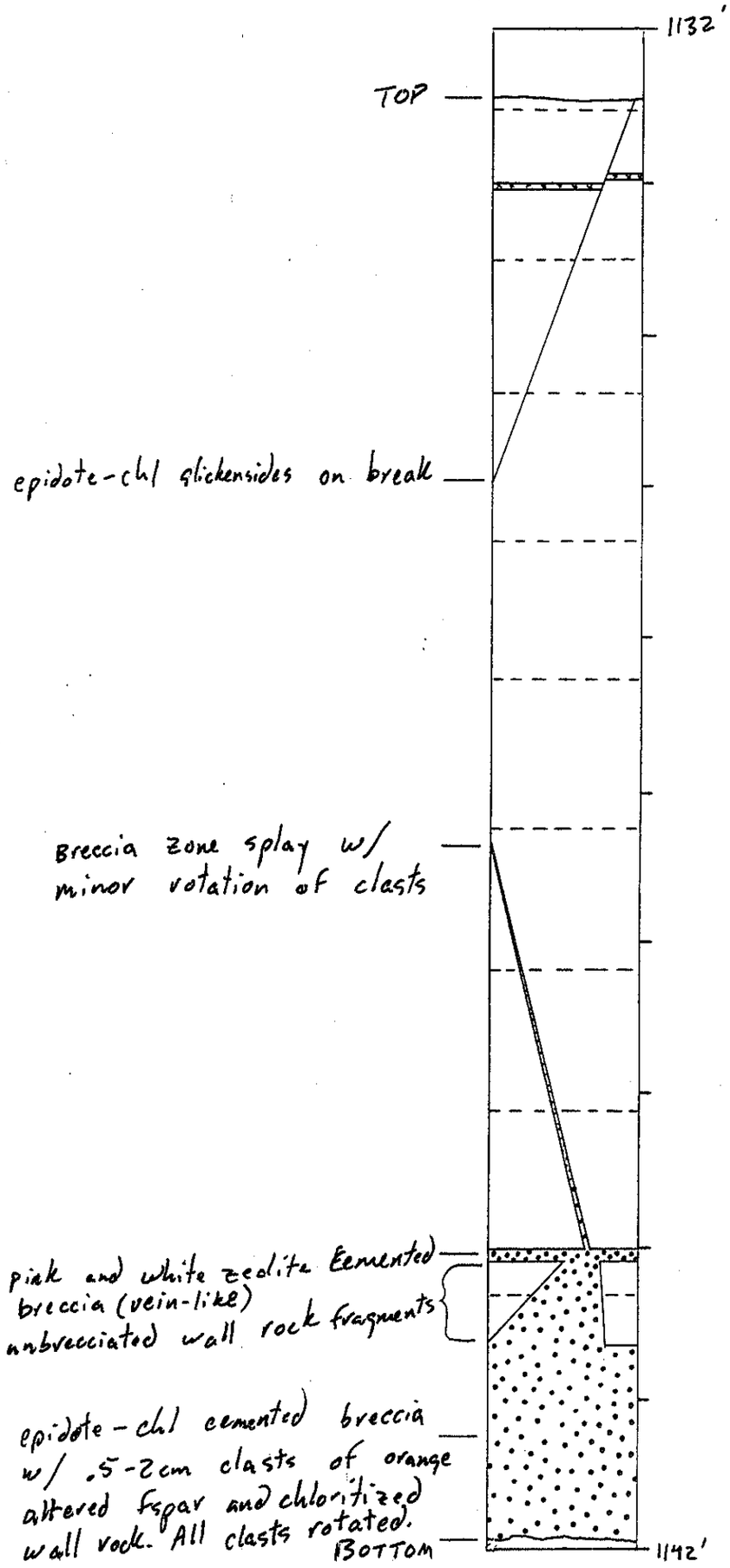


CORE LOG Gillette Castle BOX# 116 INTERVAL 1123.4' - 1132.4'

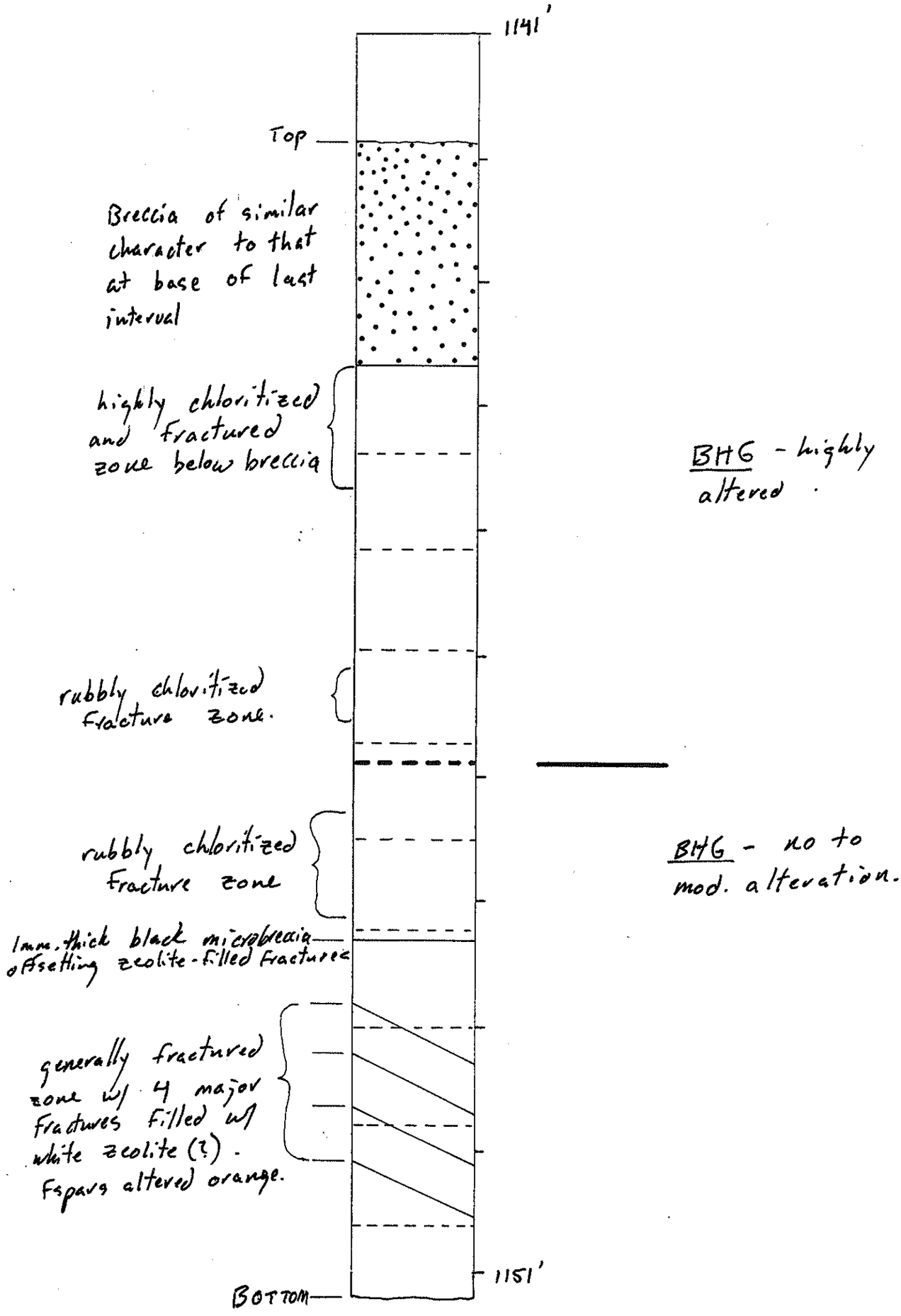


CORE LOG Gillette Castle BOX# 117 INTERVAL 1132.4'-1141.9'

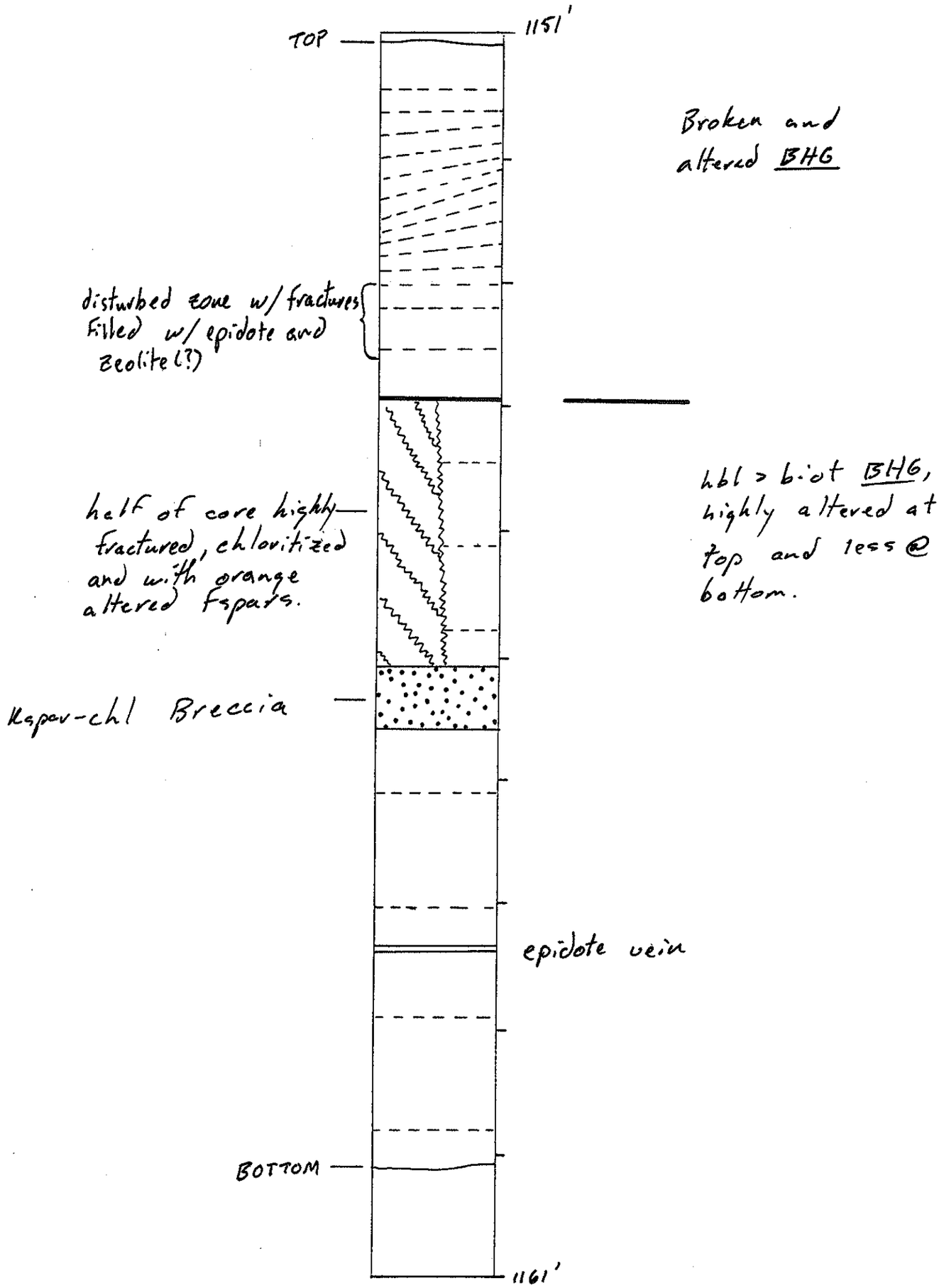
biot > hbl BHG



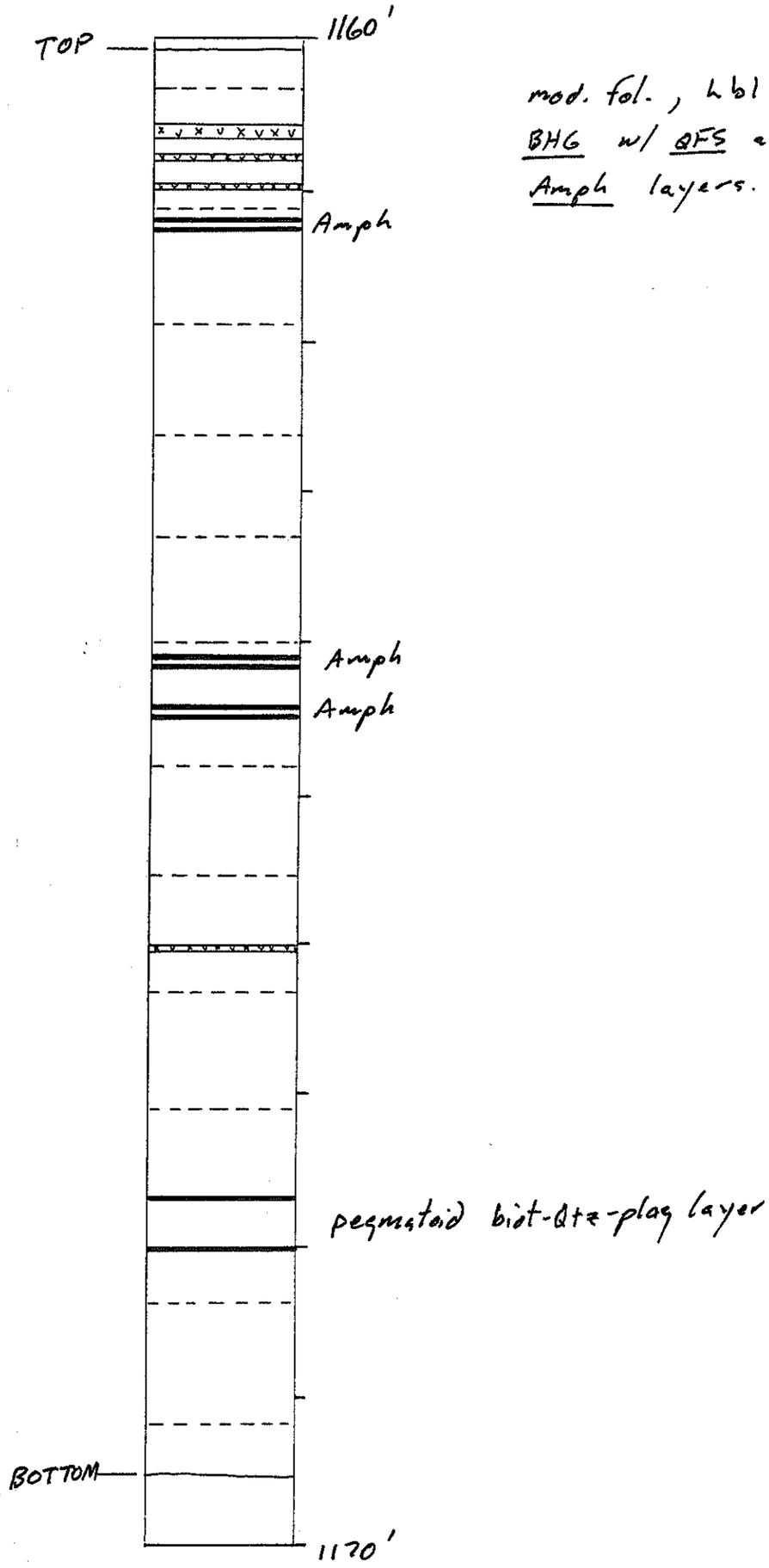
CORE LOG Gillette Castle BOX# 118 INTERVAL 1141.9' - 1151.2'



CORE LOG Gillette Castle BOX# 119 INTERVAL 1151.2' - 1160.1'

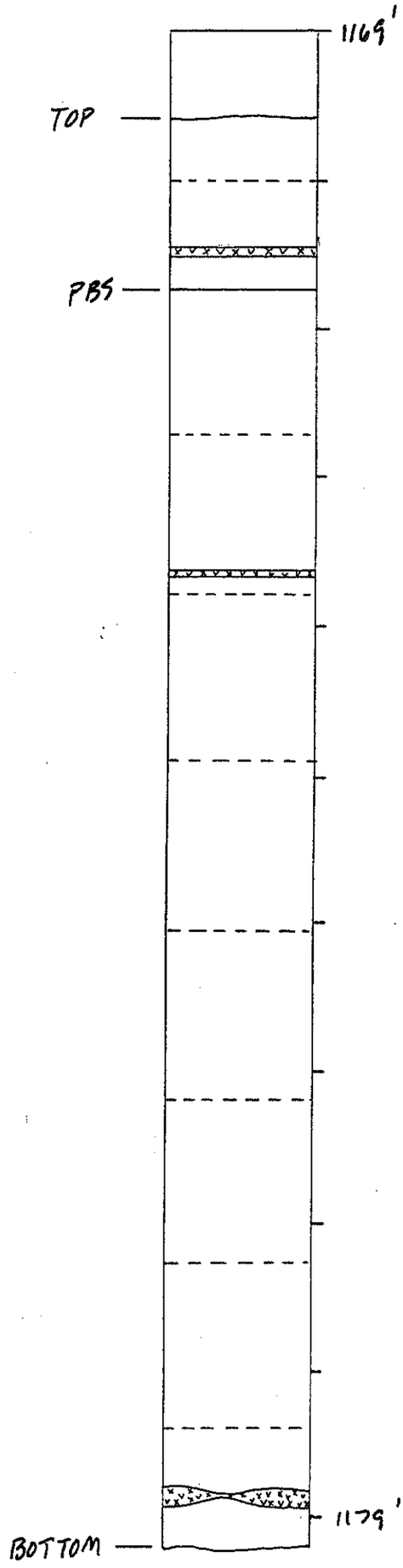


CORE LOG Gillette Castle BOX# 120 INTERVAL 1160.1' - 1169.6'



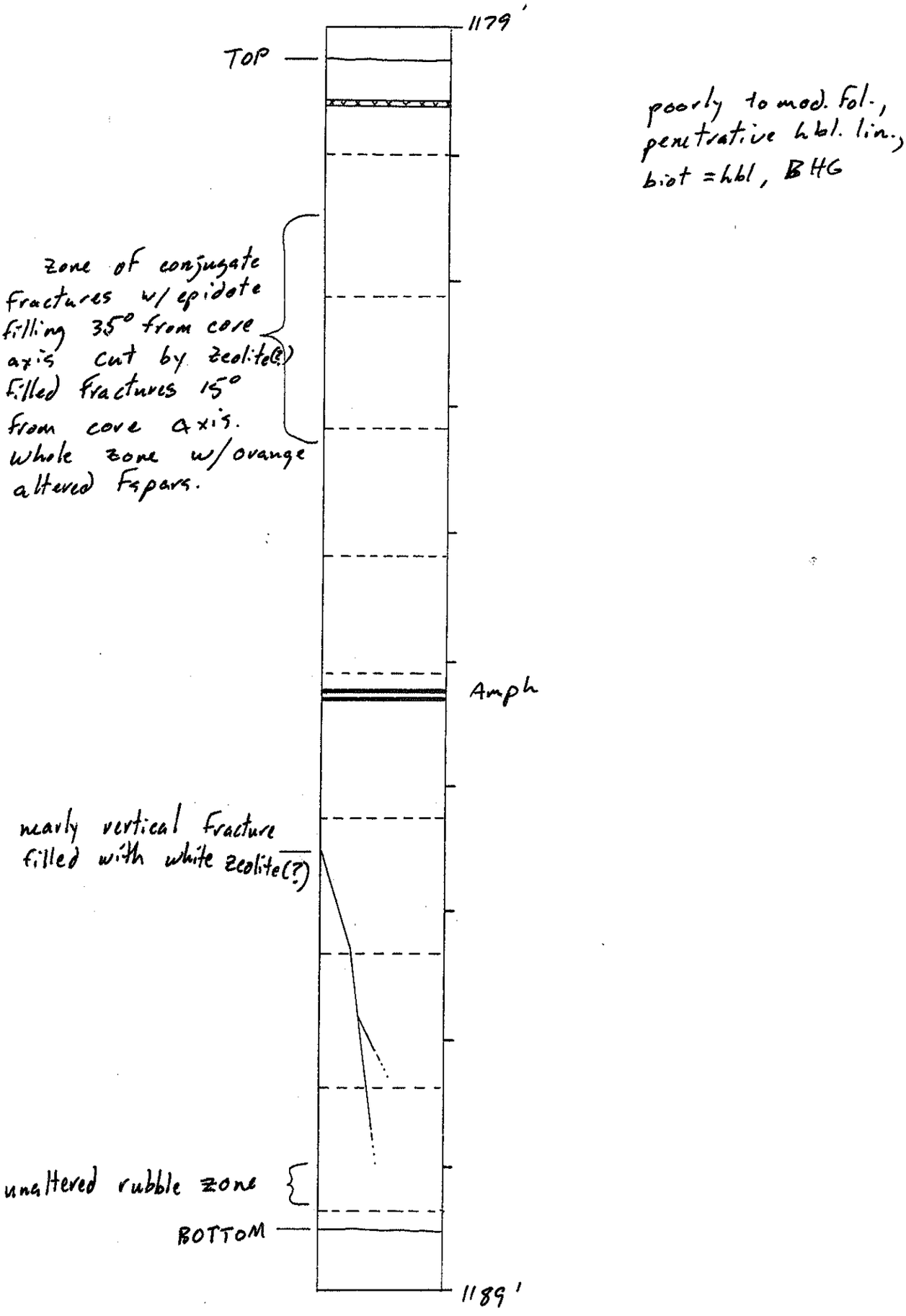
mod. fol., hbl > biot BHG w/ QFS and Amph layers.

CORE LOG Gillette Castle BOX# 121 INTERVAL 1169.6' - 1179.2'

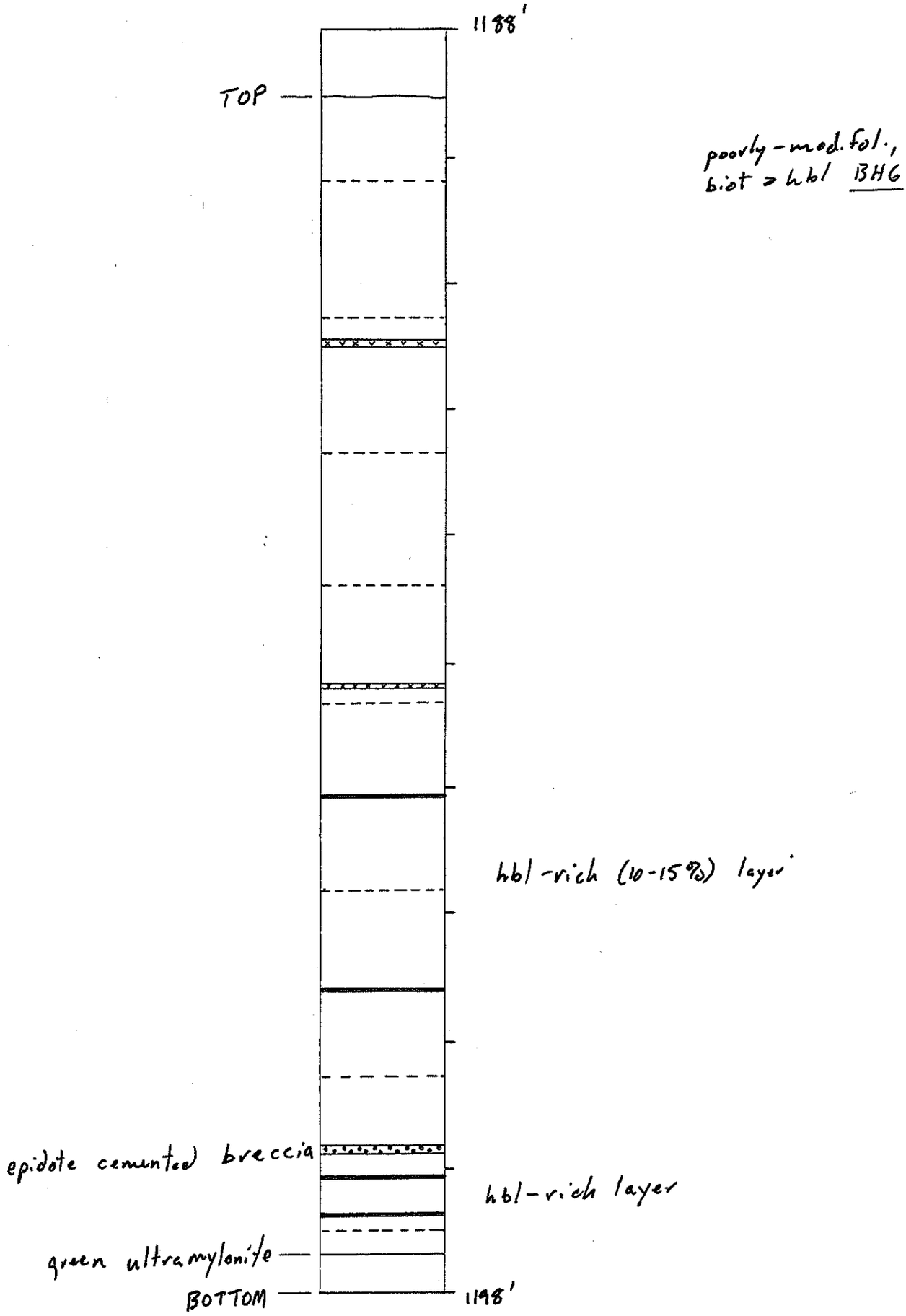


poor-mod. fol, penetrativ.
hbl-lineation, hbl > biot
BHG.

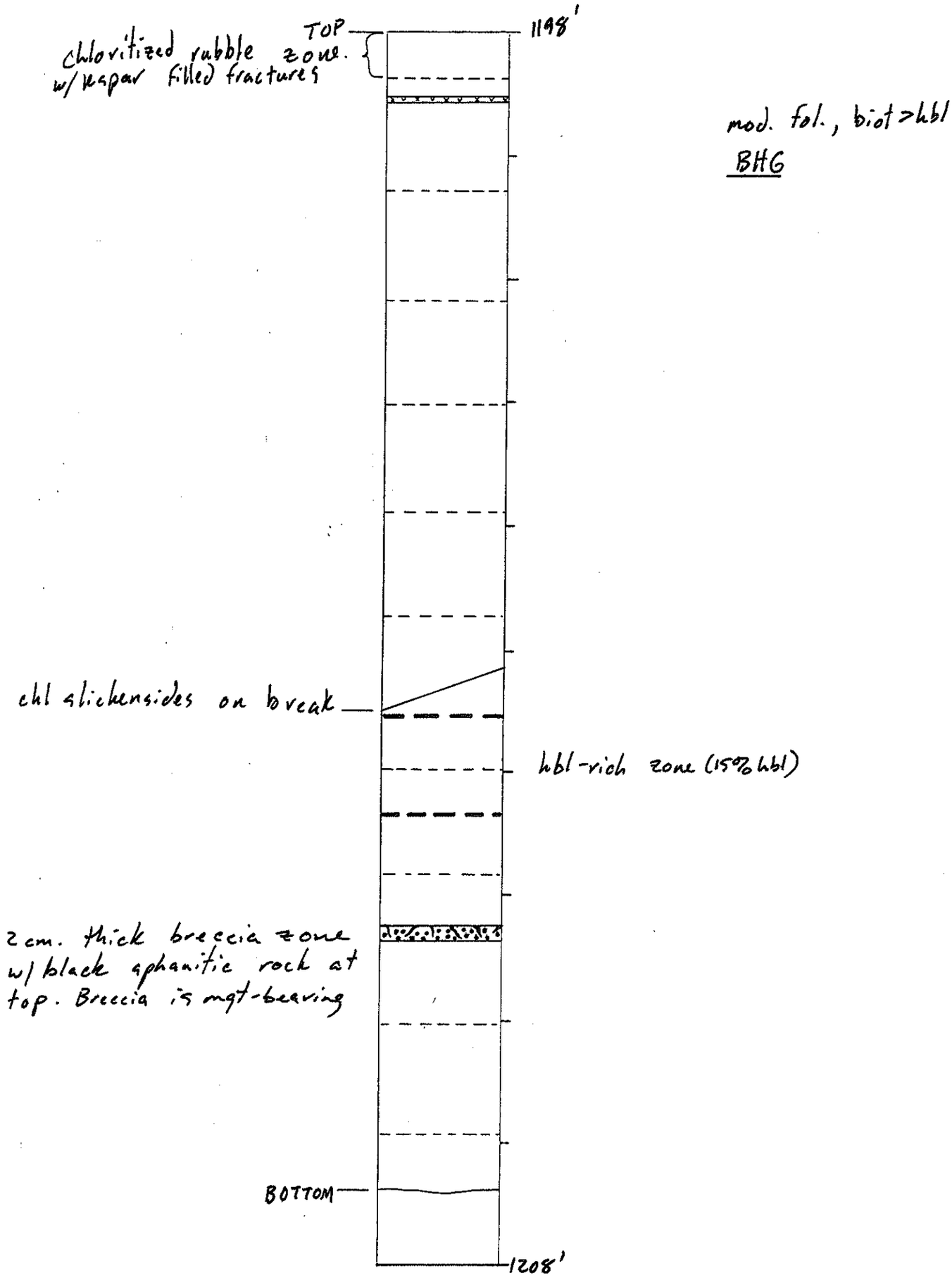
CORE LOG Gillette Castle BOX# 122 INTERVAL 1179.2' - 1188.5'



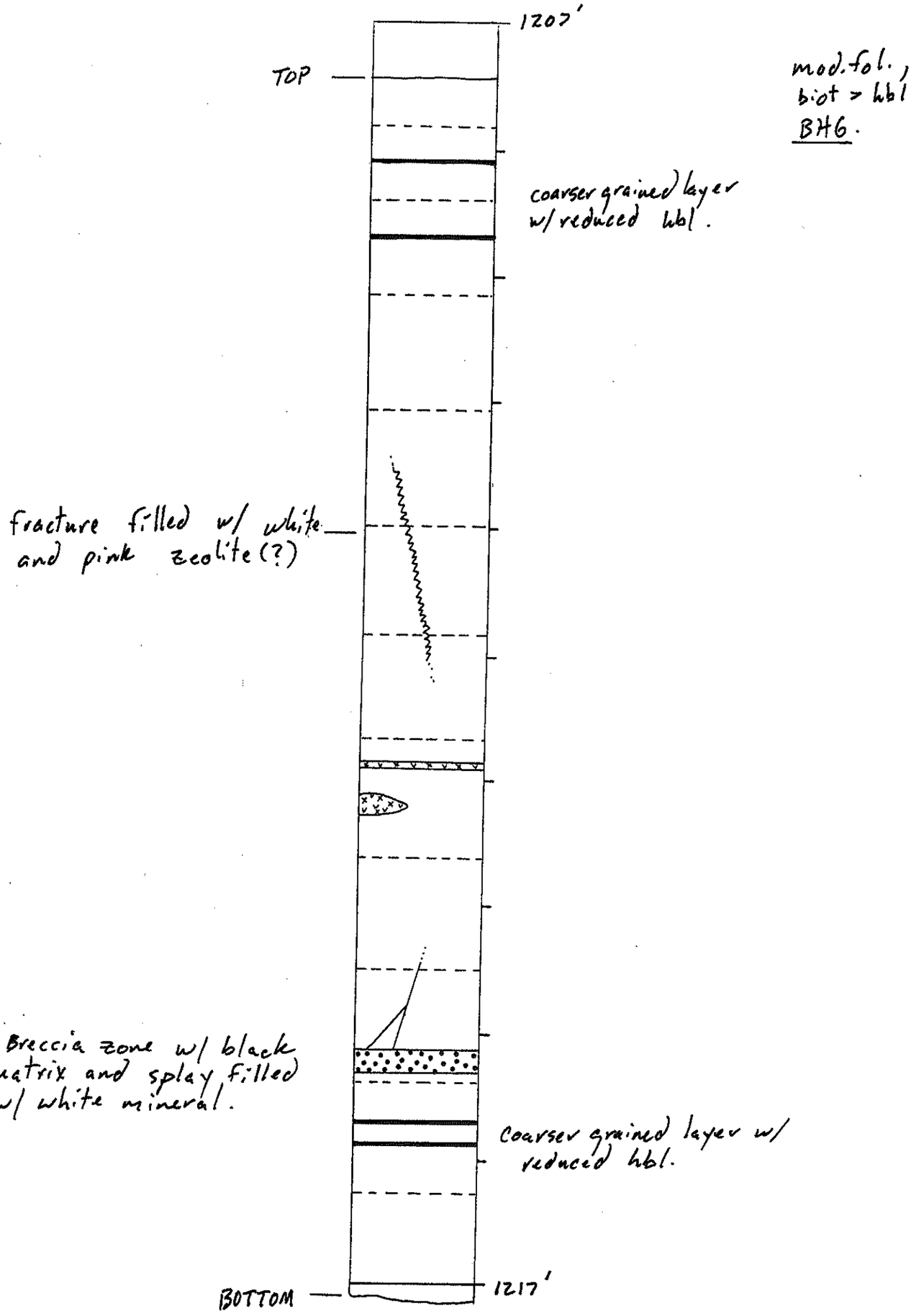
CORE LOG Gillette Castle BOX# 123 INTERVAL 1188.5' - 1198.0'



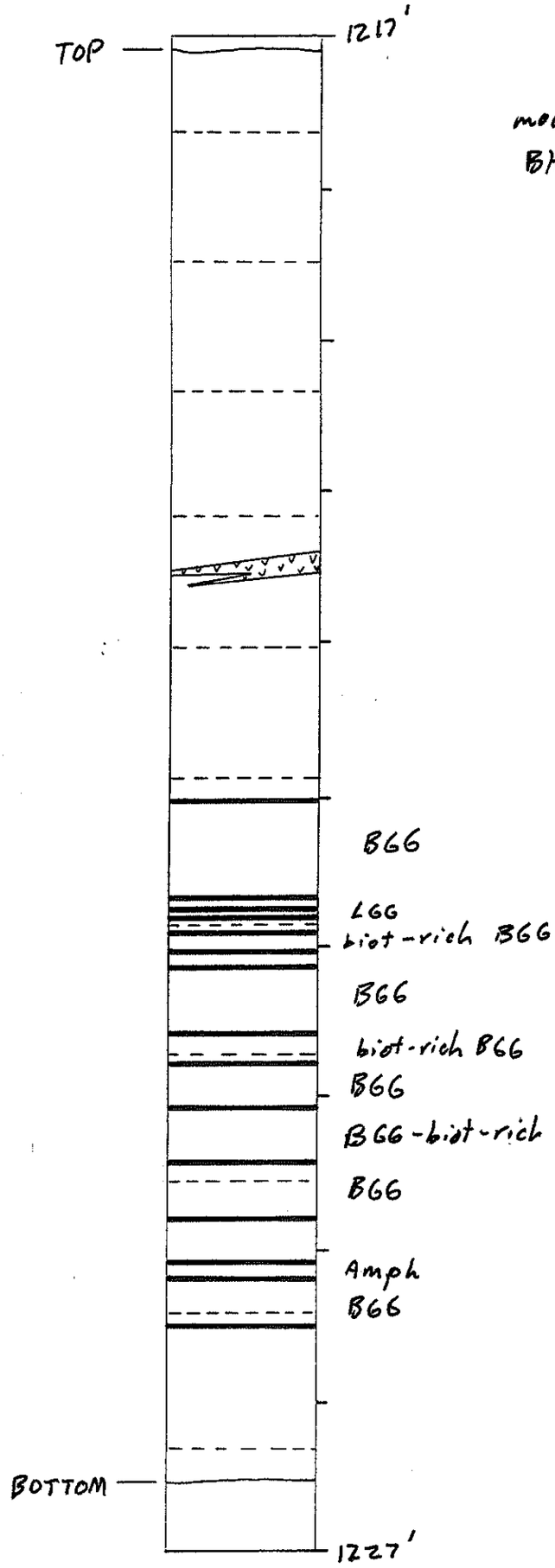
CORE LOG Gillette Castle BOX# 124 INTERVAL 1198.0' - 1202.4'



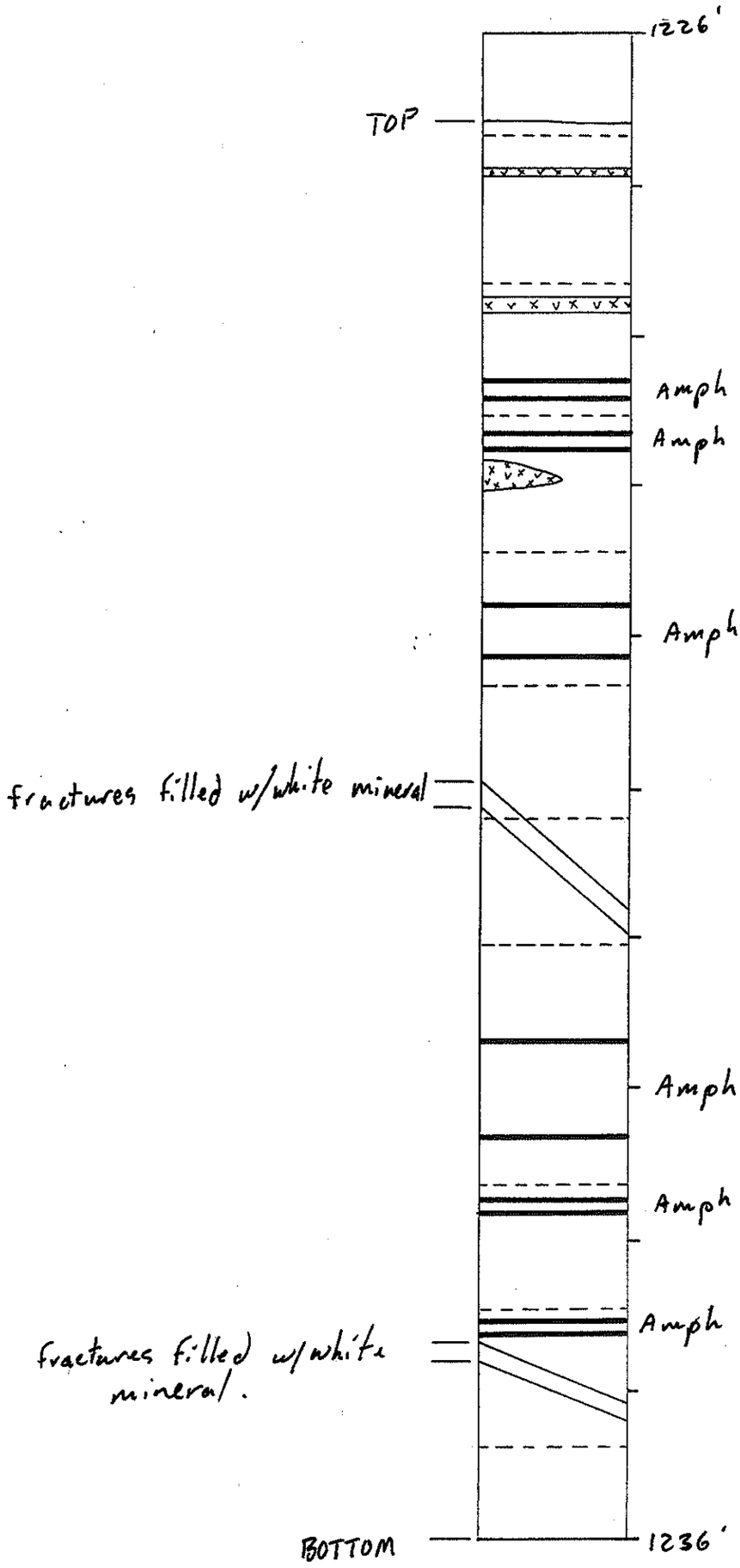
CORE LOG Gillette Castle BOX# 125 INTERVAL 1207.4' - 1217.1'



CORE LOG Gillette Castle BOX# 126 INTERVAL 1217.1' - 1226.6'



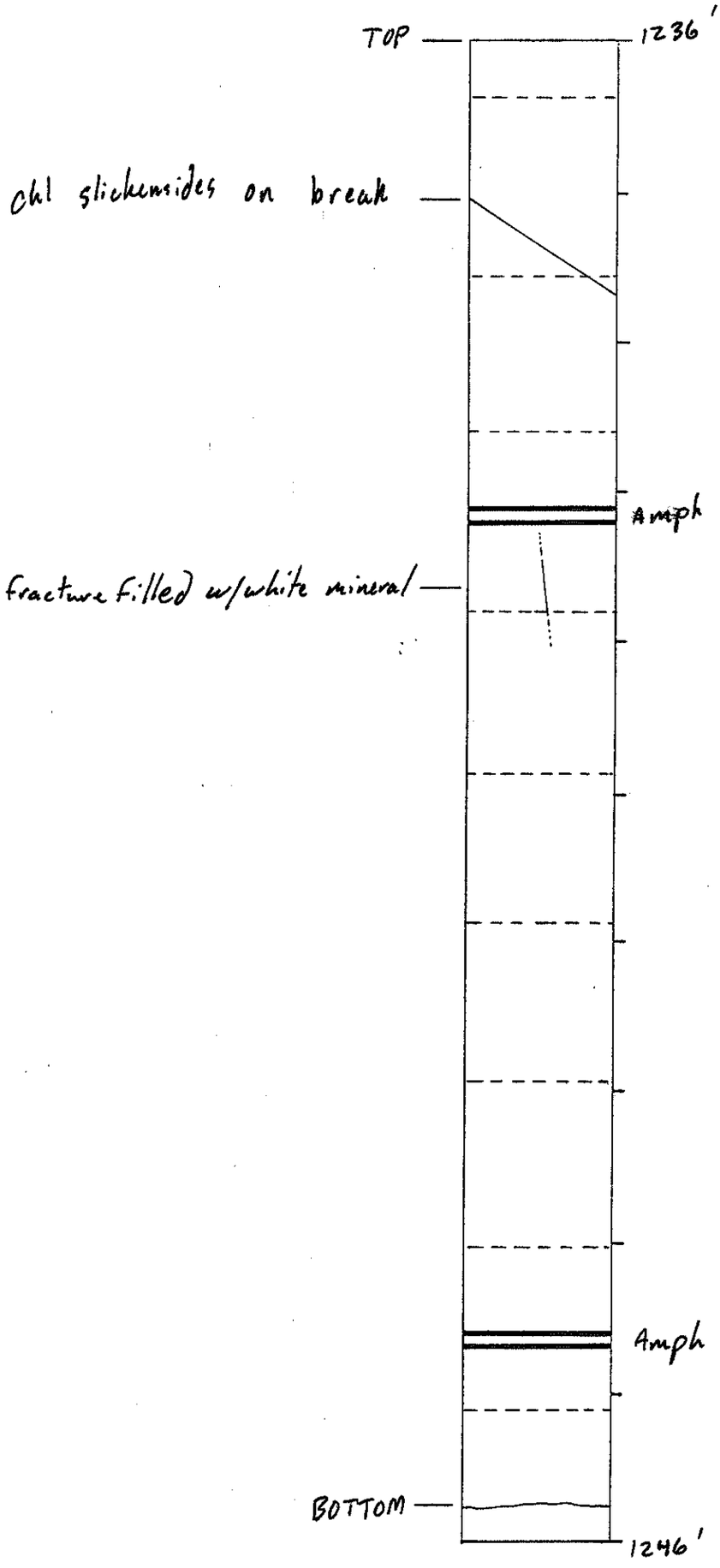
CORE LOG Gillette Castle BOX# 127 INTERVAL 1226.6' - 1236.0'



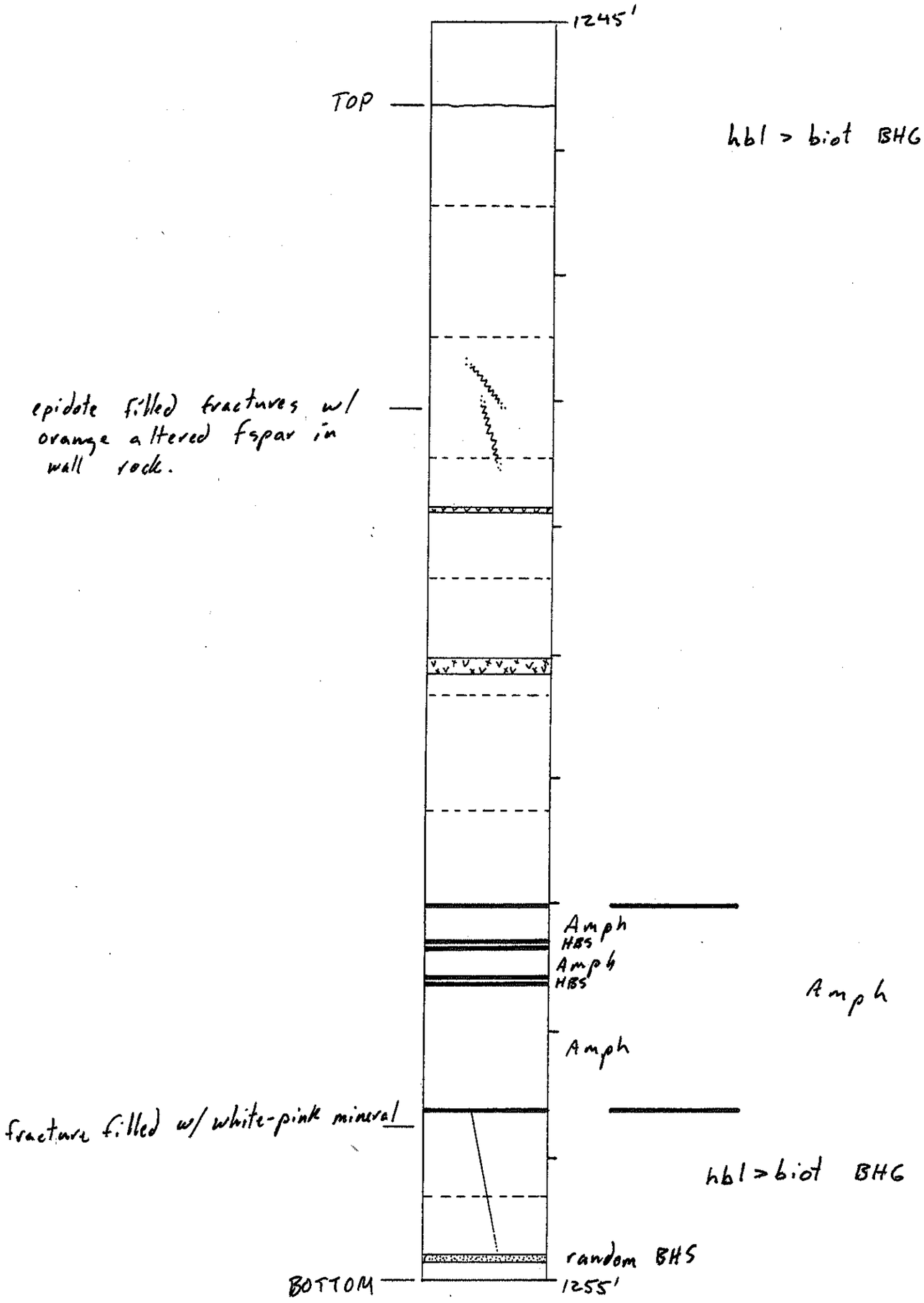
Interlayered Amph and hbl > biot BHG.

CORE LOG Gillette Castle BOX# 128 INTERVAL 1236.0'-1245.7'

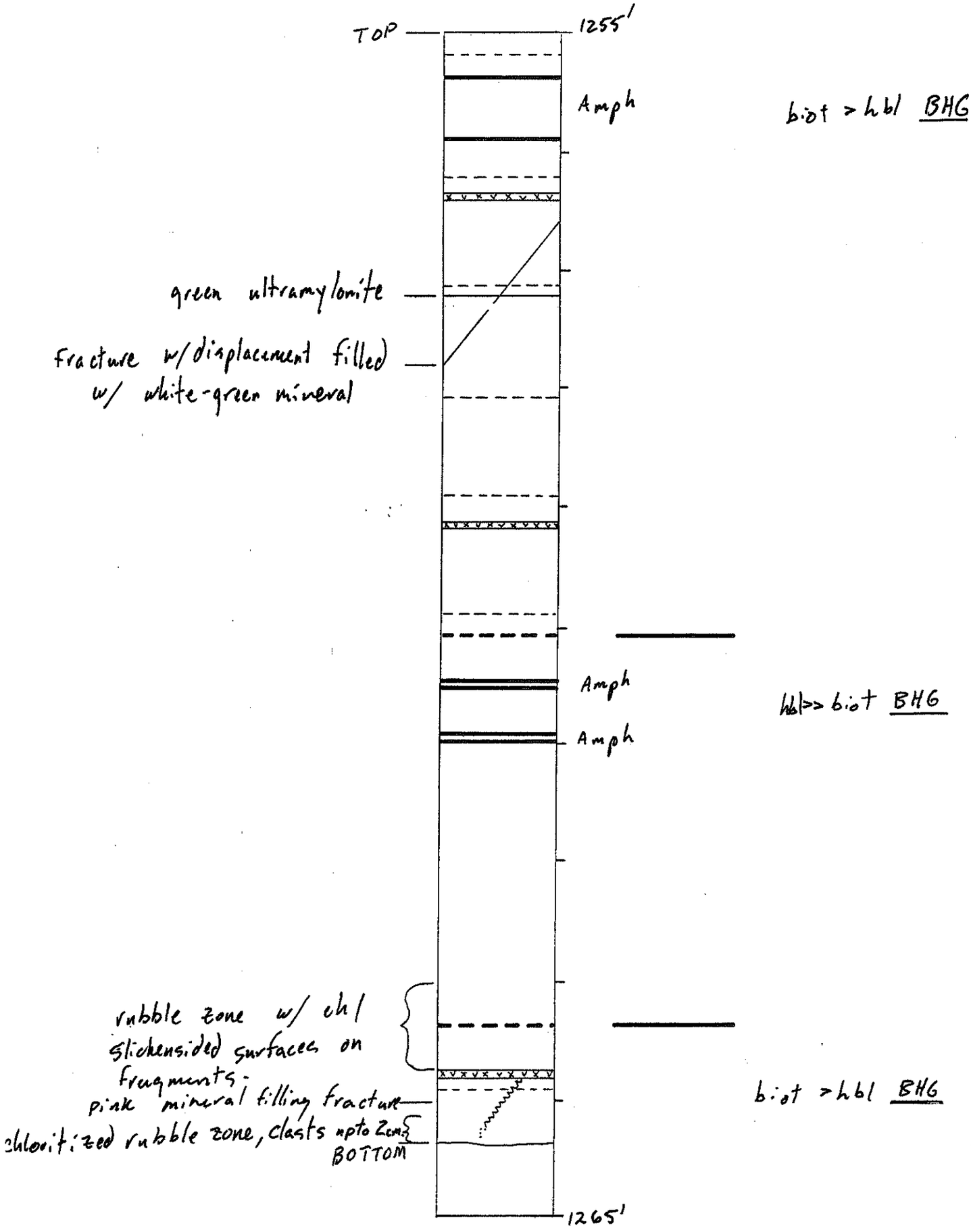
hbl > biot BHG



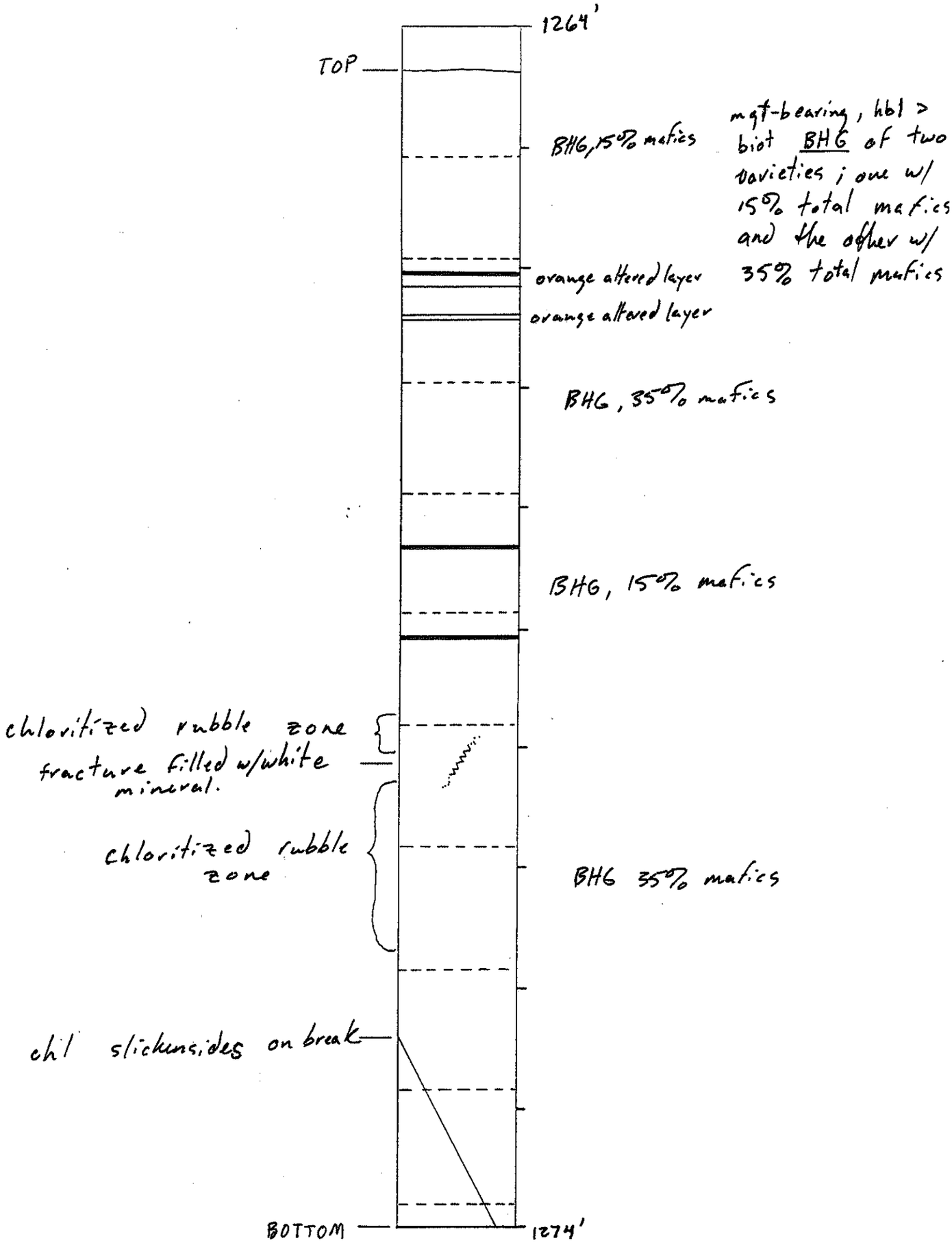
CORE LOG Gillette Castle BOX# 129 INTERVAL 1245.7' - 1255.0'



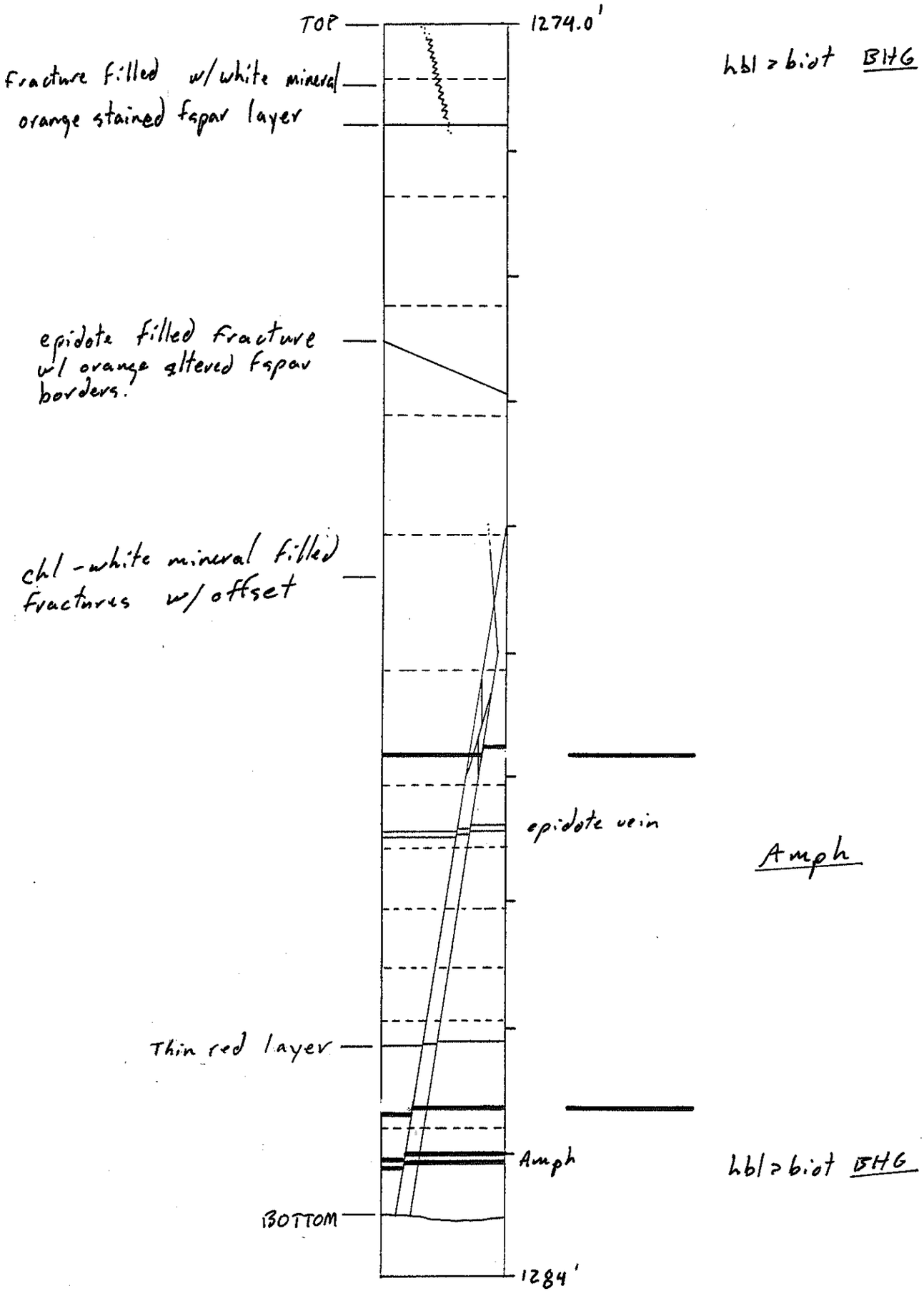
CORE LOG Gillette Castle BOX# 130 INTERVAL 1255.0' - 1264.3'



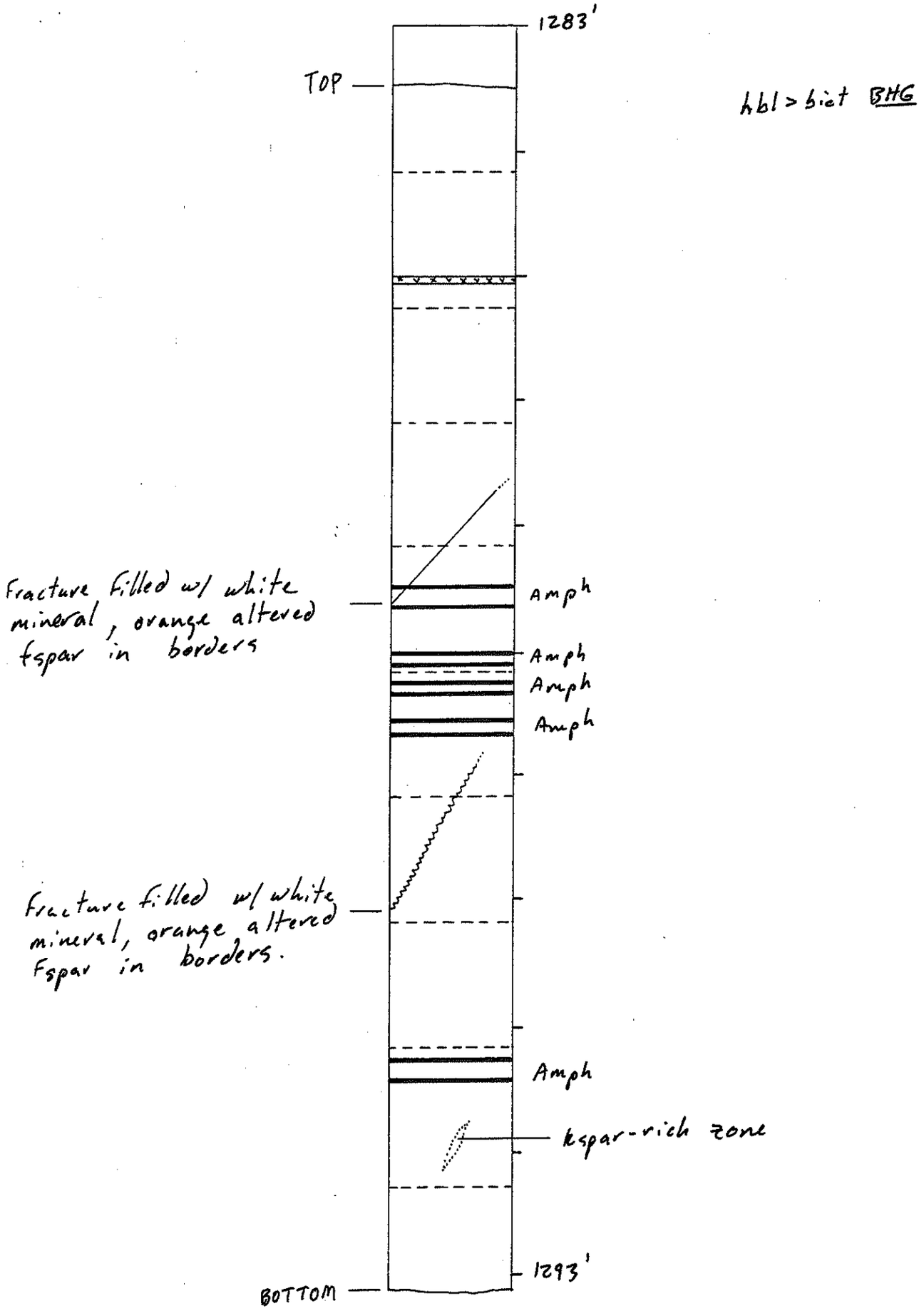
CORE LOG Gillette Castle BOX# 131 INTERVAL 1264.3' - 1274.0'



CORE LOG Gillette Castle BOX# 132 INTERVAL 1274.0' - 1283.5'

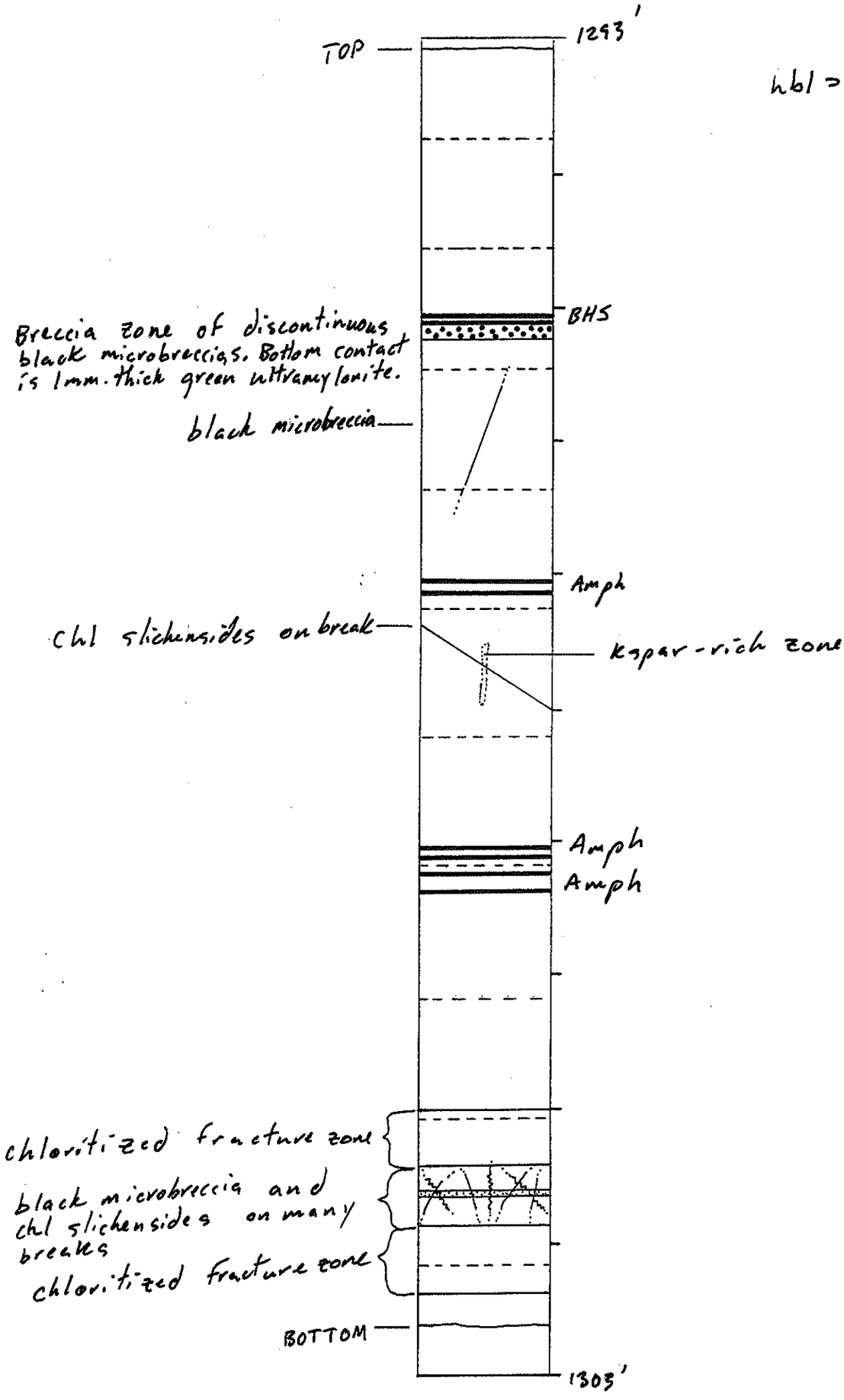


CORE LOG Gillette Castle BOX# 133 INTERVAL 1283.5' - 1293.1'

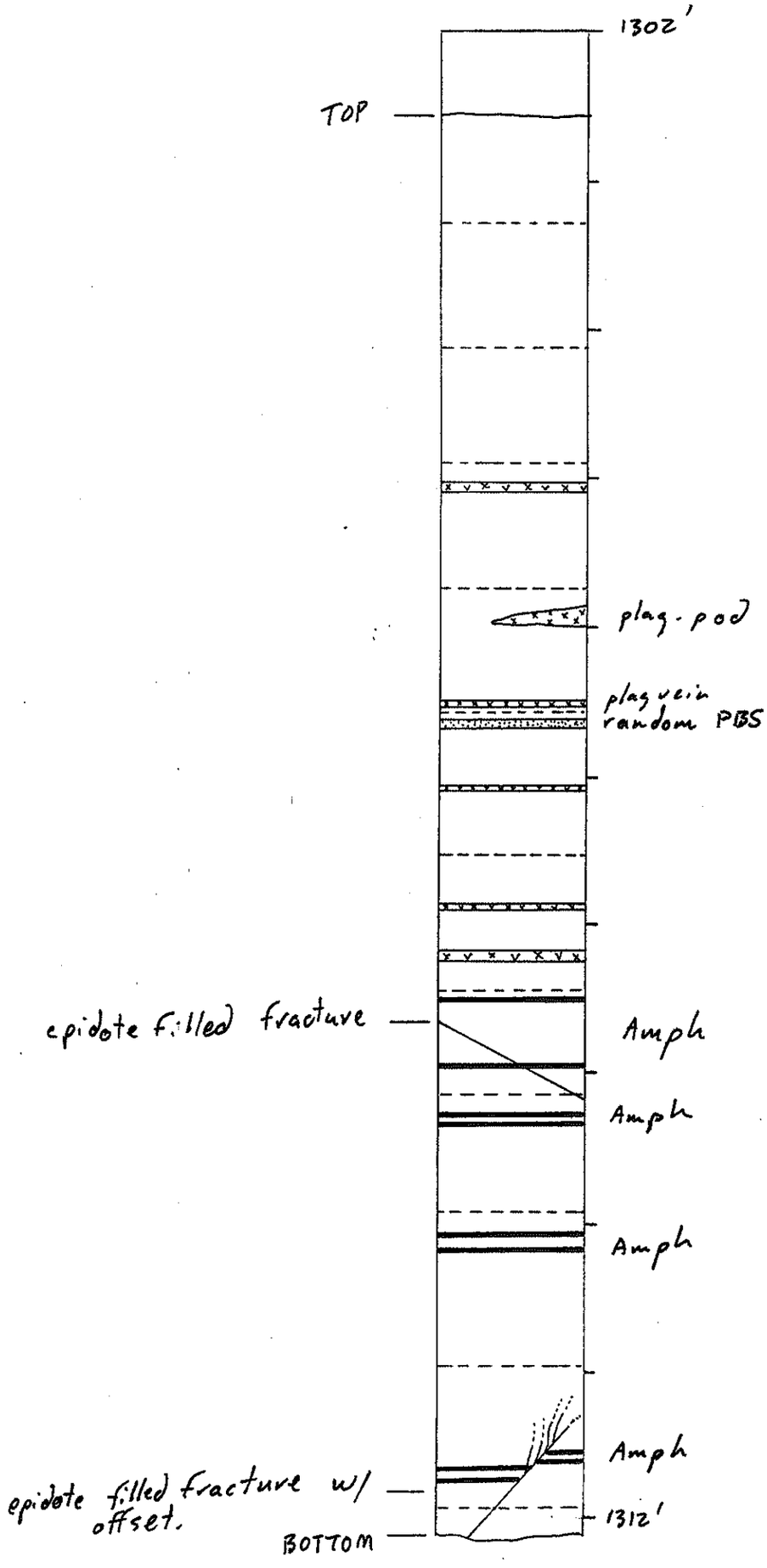


CORE LOG Gillette Castle BOX# 134 INTERVAL 1293.1'-1302.6'

hbl = biot BH6

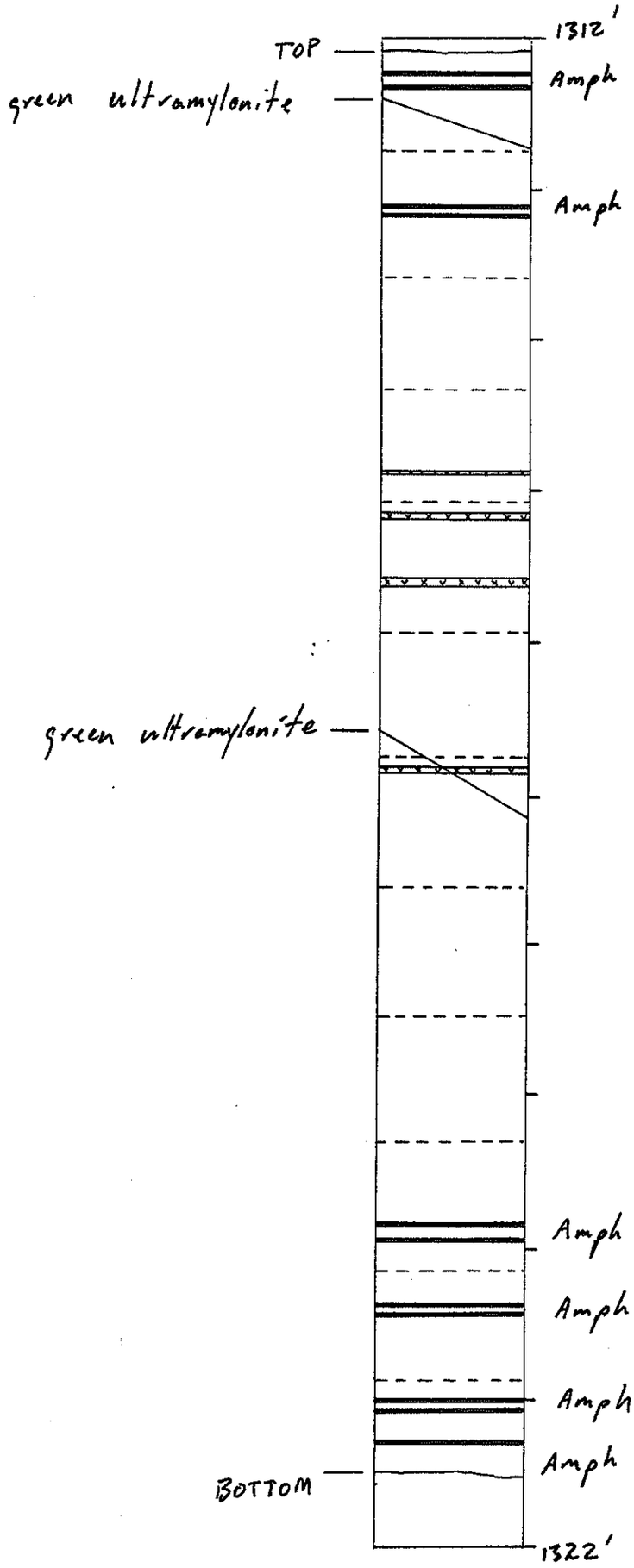


CORE LOG Gillette Castle BOX# 135 INTERVAL 1302.6'-1312.1'



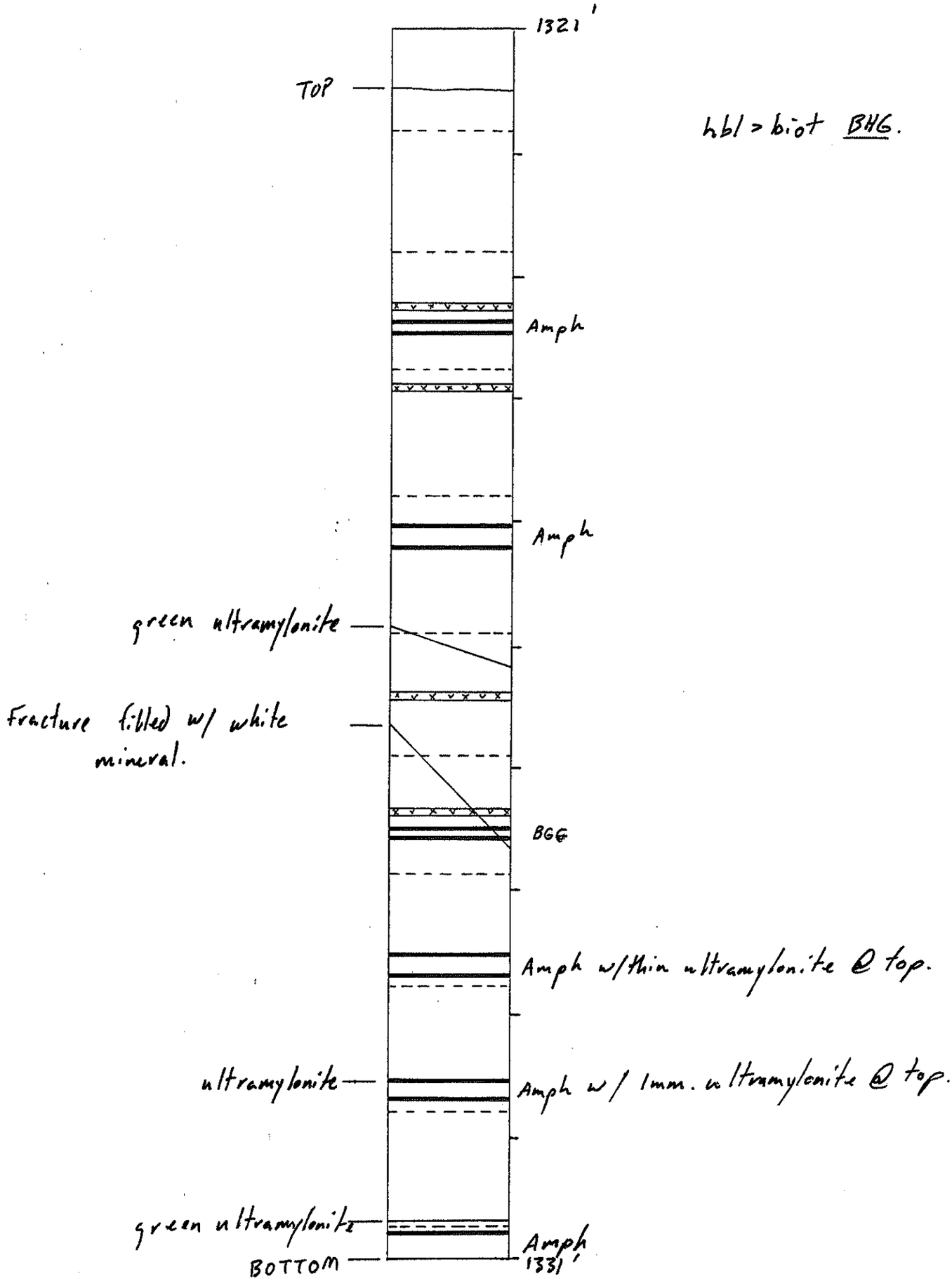
hbl > biot BHG

CORE LOG Gillette Castle BOX# 136 INTERVAL 1312.1'-1321.5'

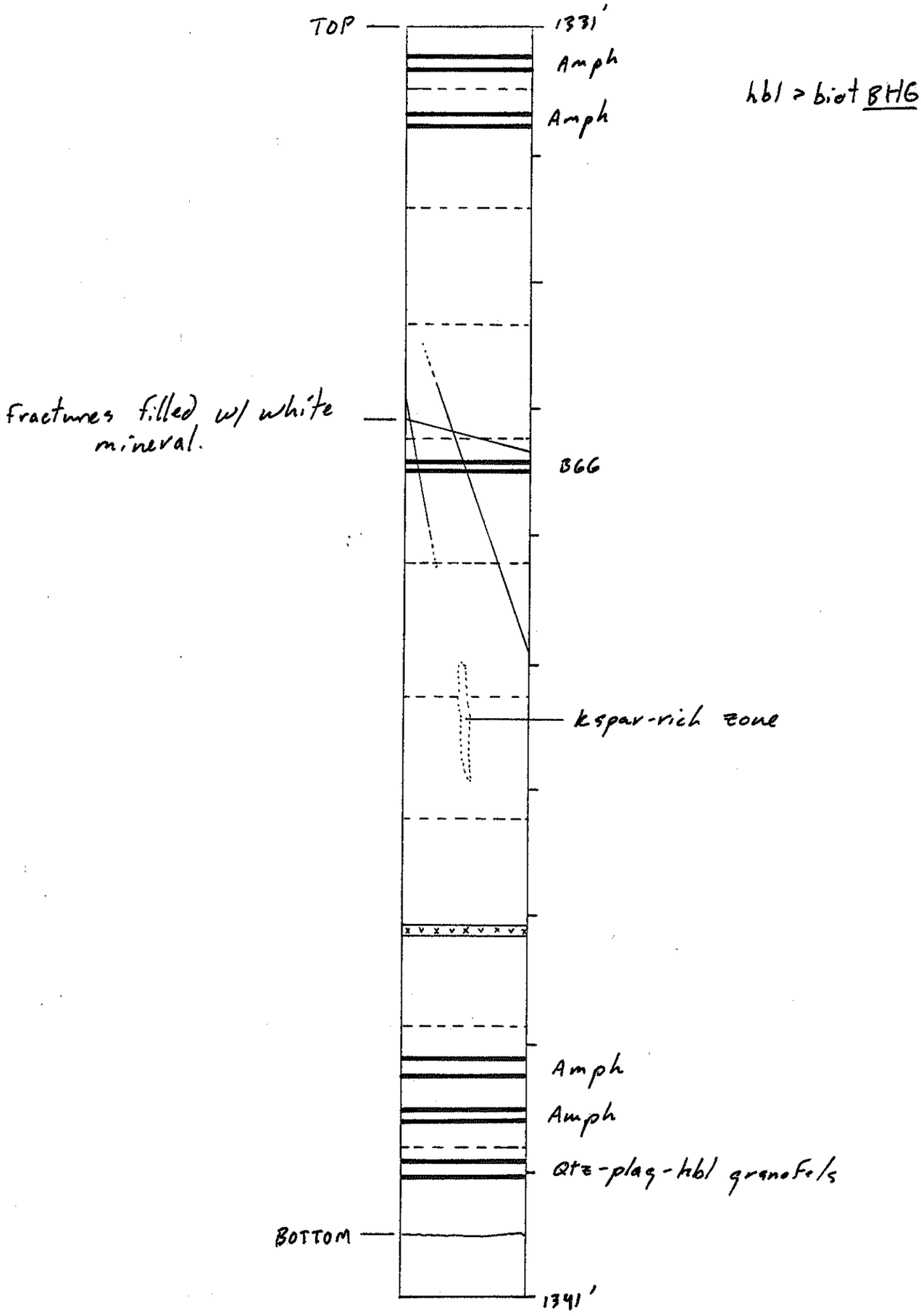


hbl > biot BHG, mgt-bearing

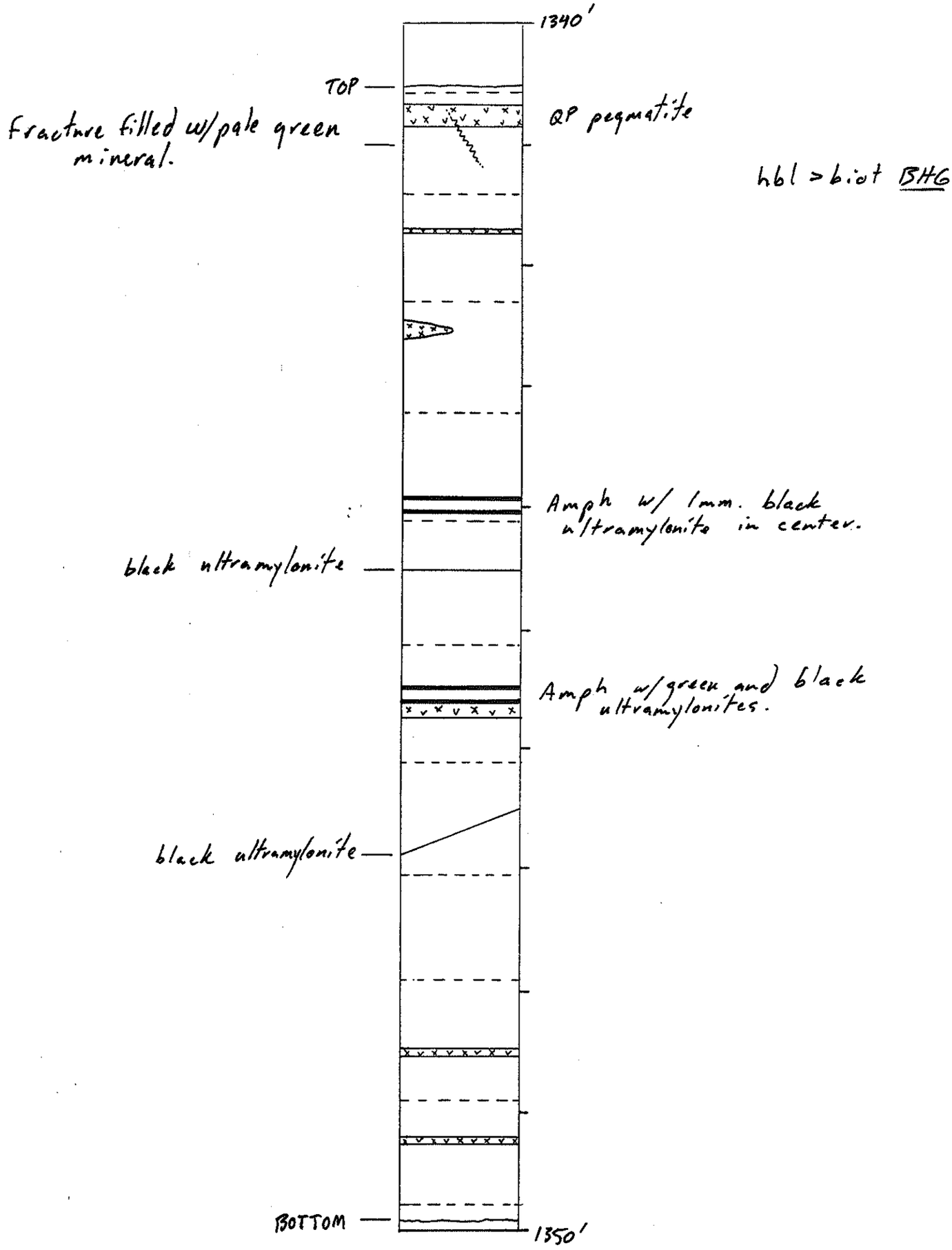
CORE LOG Gillette Castle BOX# 137 INTERVAL 1321.5'-1331.0'



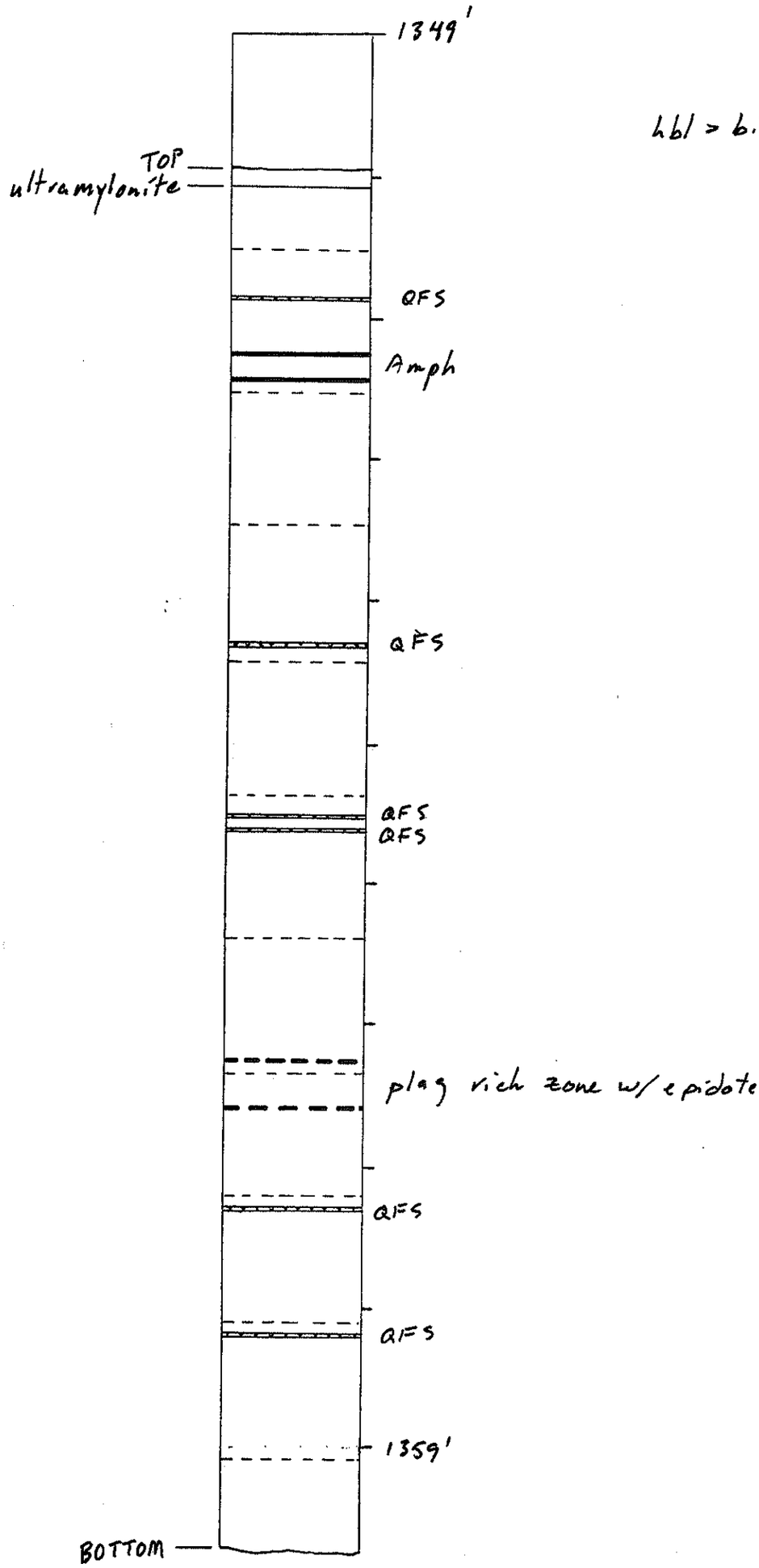
CORE LOG Gillette Castle BOX# 138 INTERVAL 1331.0' - 1340.5'



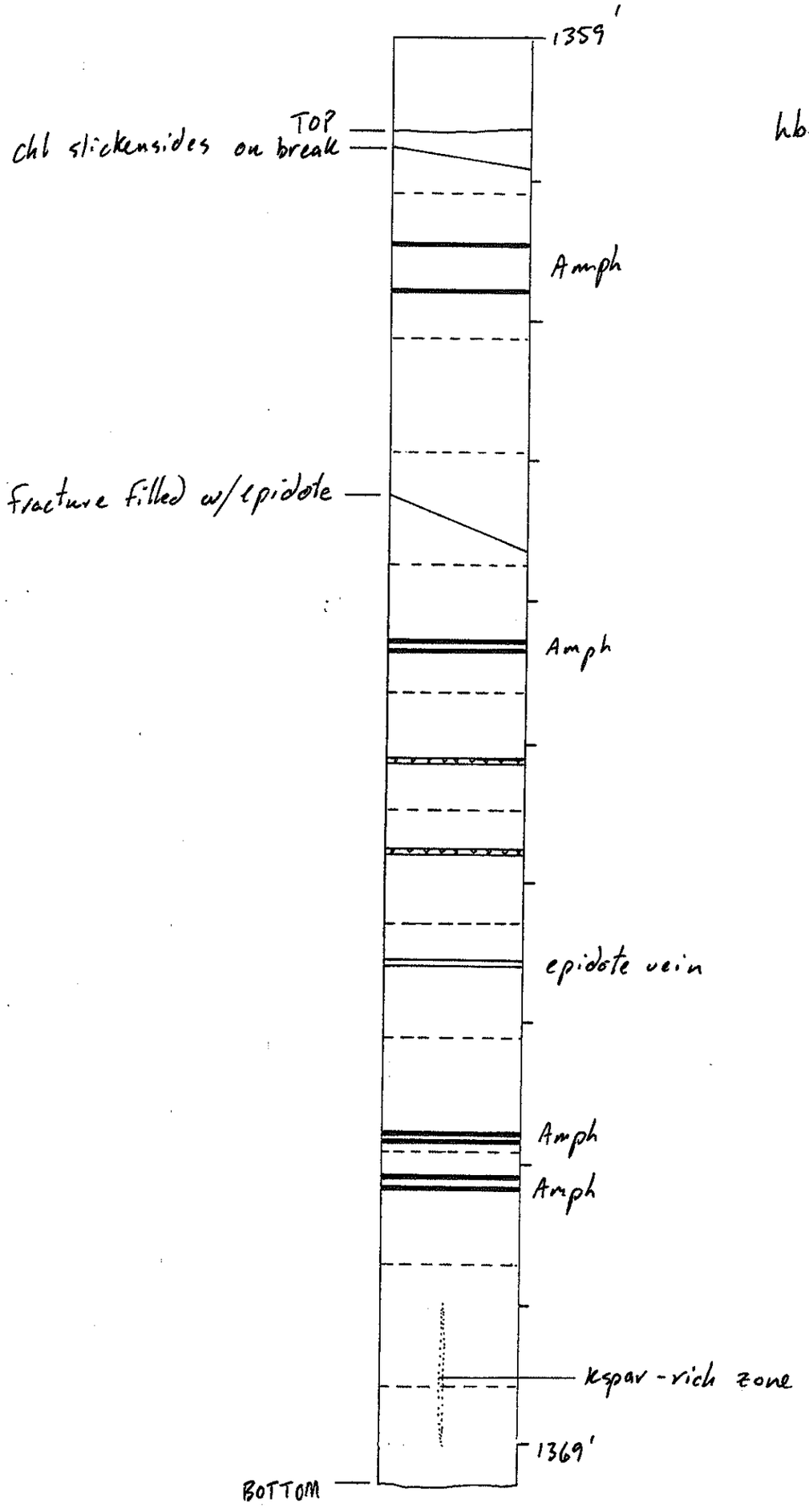
CORE LOG Gillette Castle BOX# 139 INTERVAL 1340.5' - 1349.9'



CORE LOG Gillette Castle BOX# 140 INTERVAL 1349.9' - 1359.7'

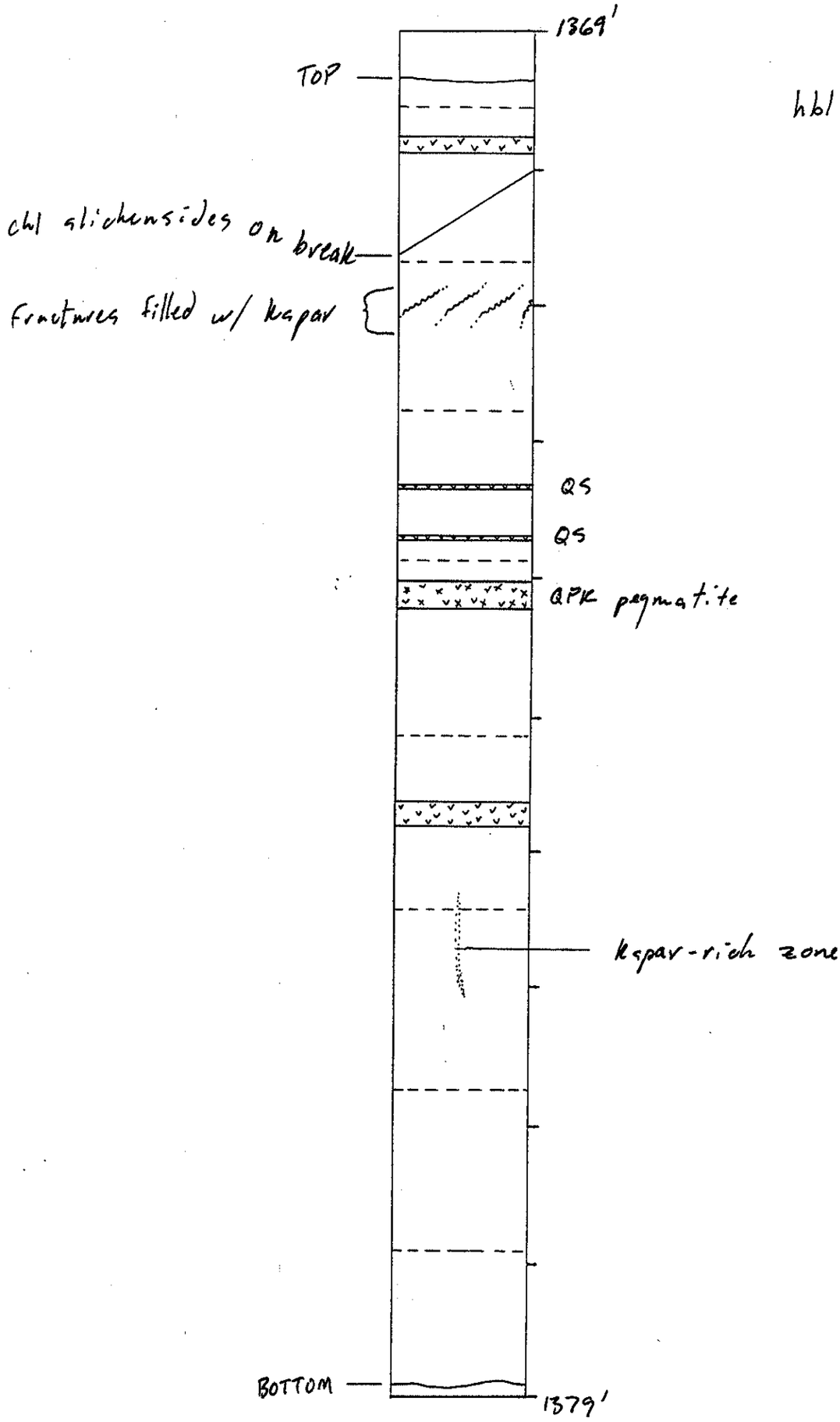


CORE LOG Gillette Castle BOX# 141 INTERVAL 1359.7'-1369.3'



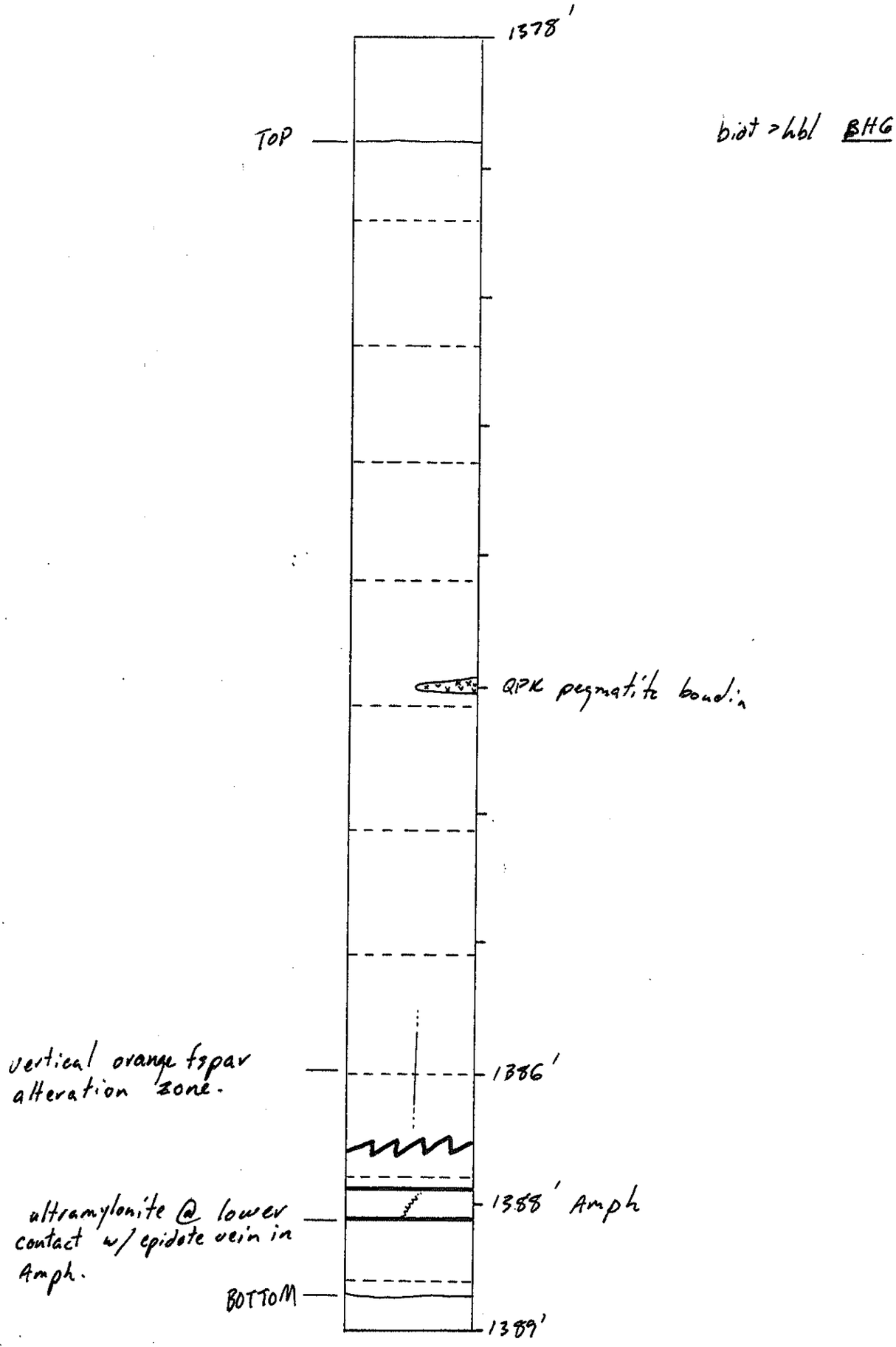
hbl = biot BH6

CORE LOG Gillette Castle BOX# 142 INTERVAL 1369.3' - 1378.9'

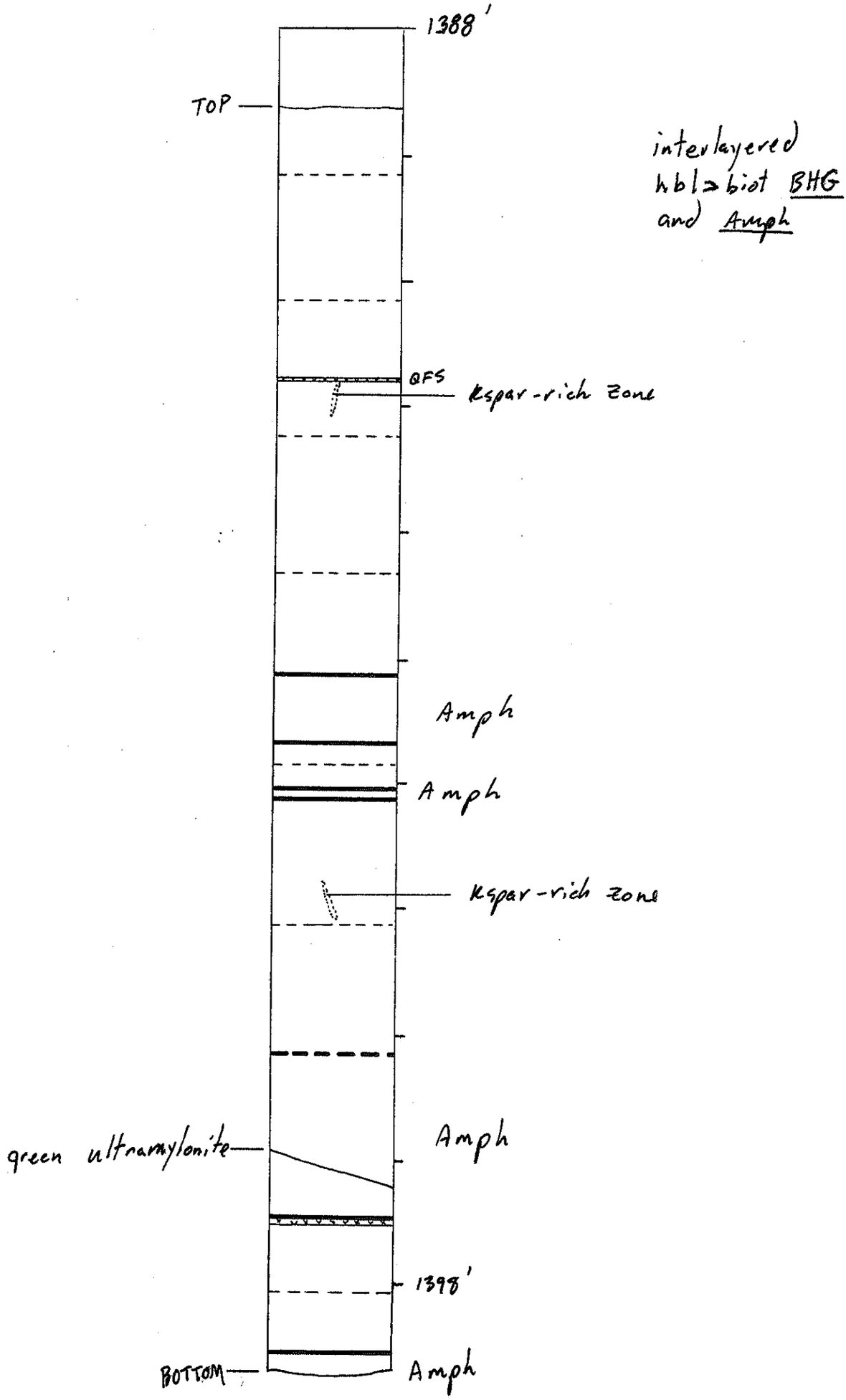


hbl = biot BHG

CORE LOG Gillette Castle BOX# 143 INTERVAL 1378.9' - 1388.7'

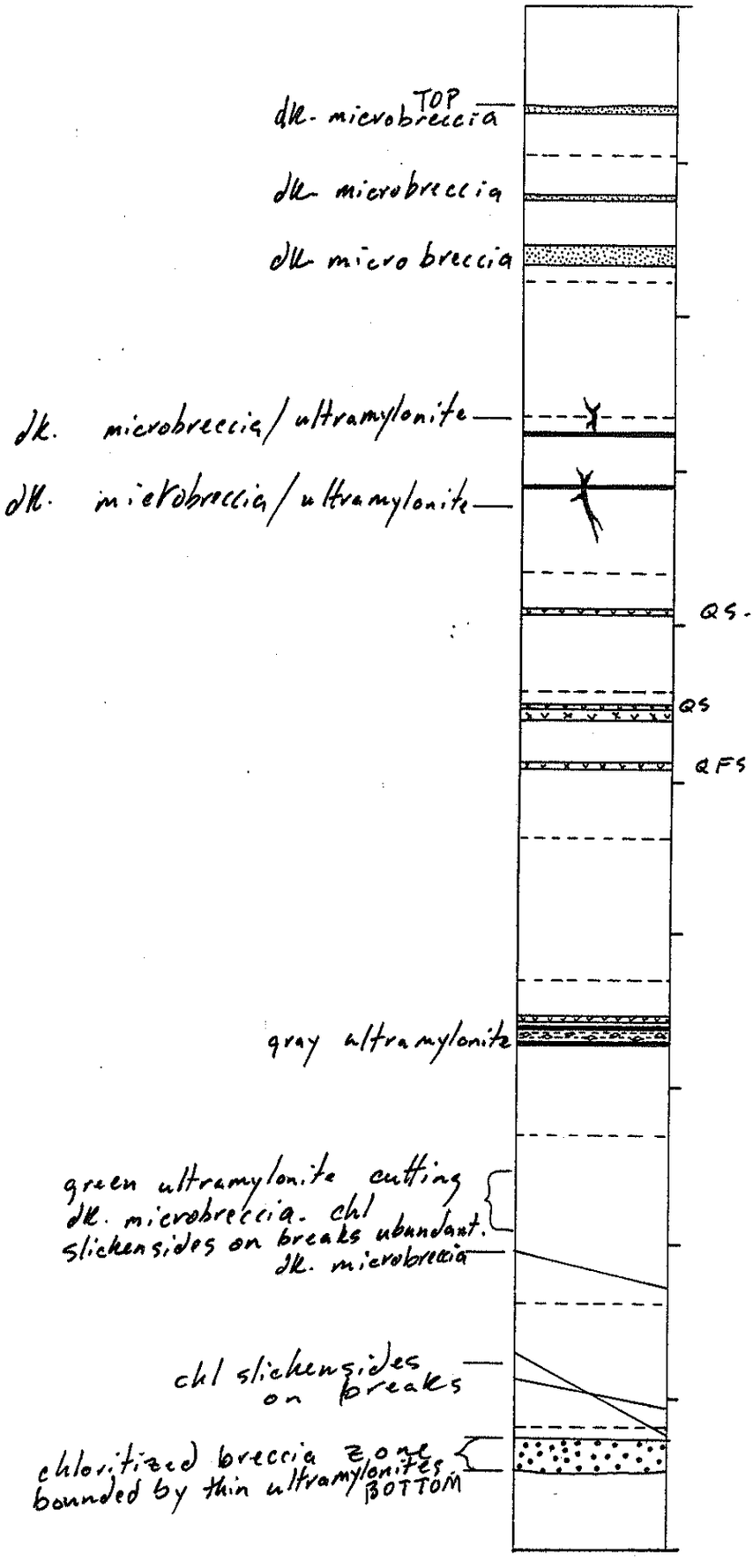


CORE LOG Billette Castle BOX# 144 INTERVAL 1388.7' - 1398.7'

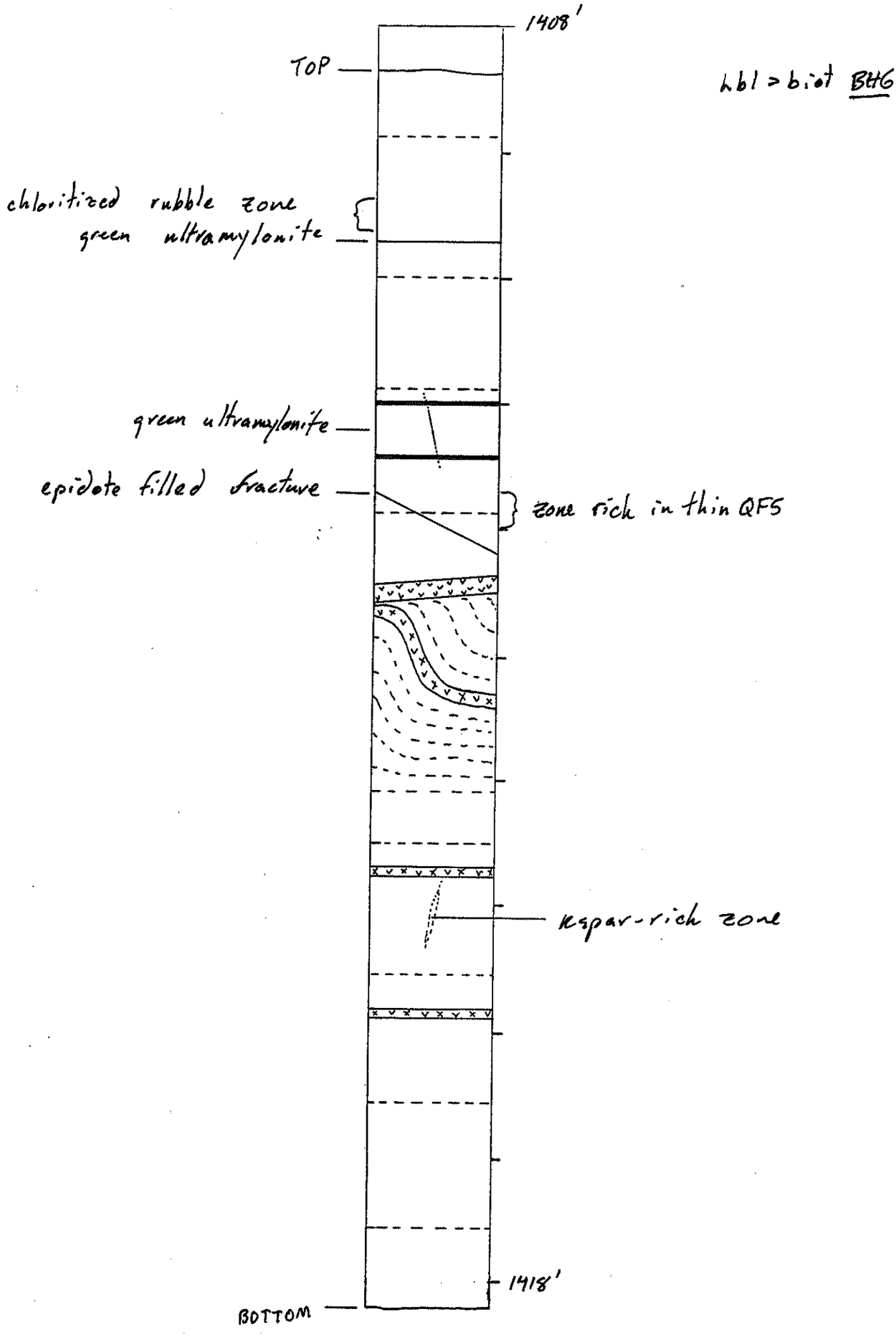


CORE LOG Gillette Castle BOX# 145 INTERVAL 1398.7' - 1408.4'

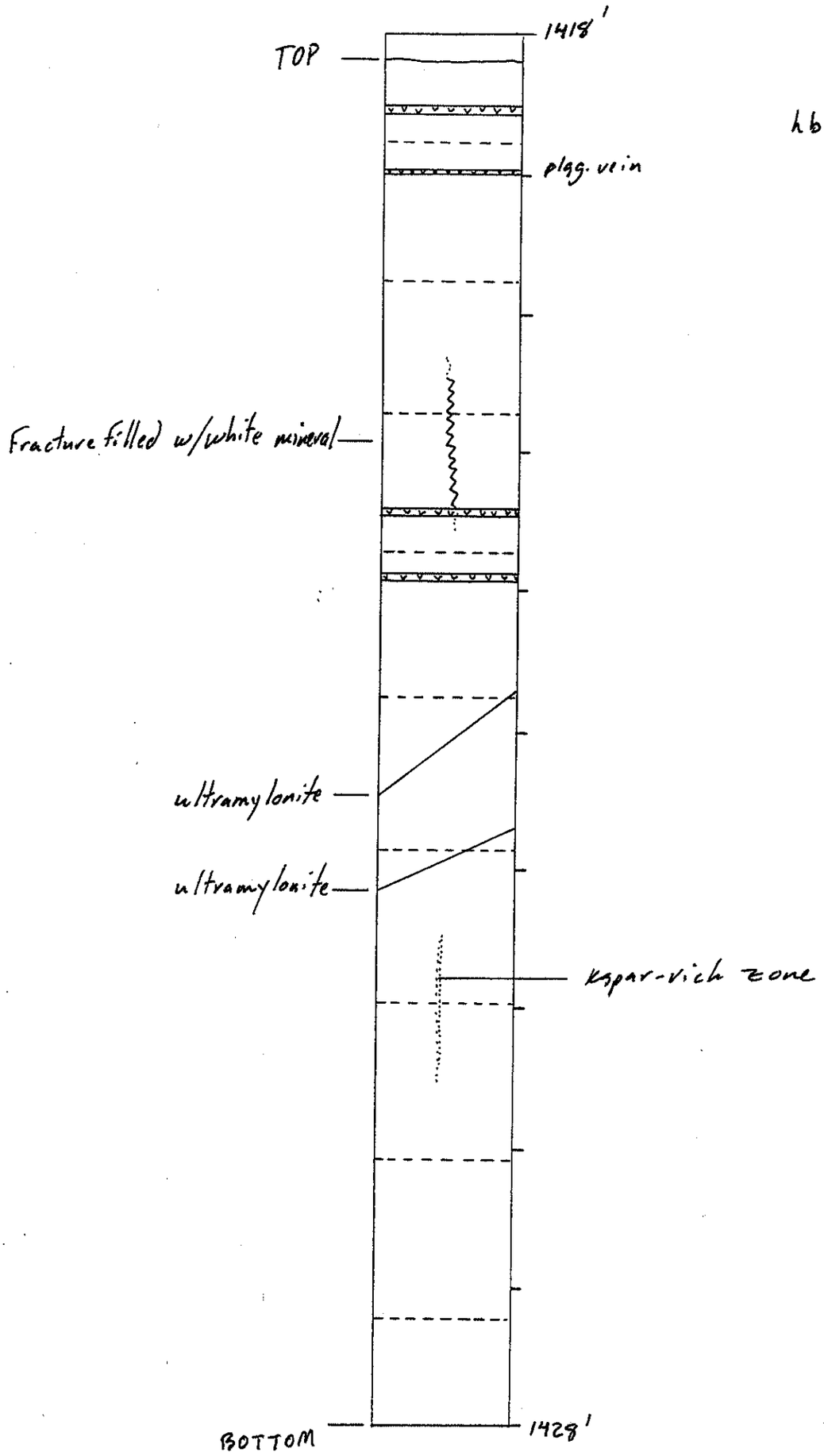
hbl > biot BHG



CORE LOG Gillette Castle BOX# 146 INTERVAL 1408.4' - 1418.2'

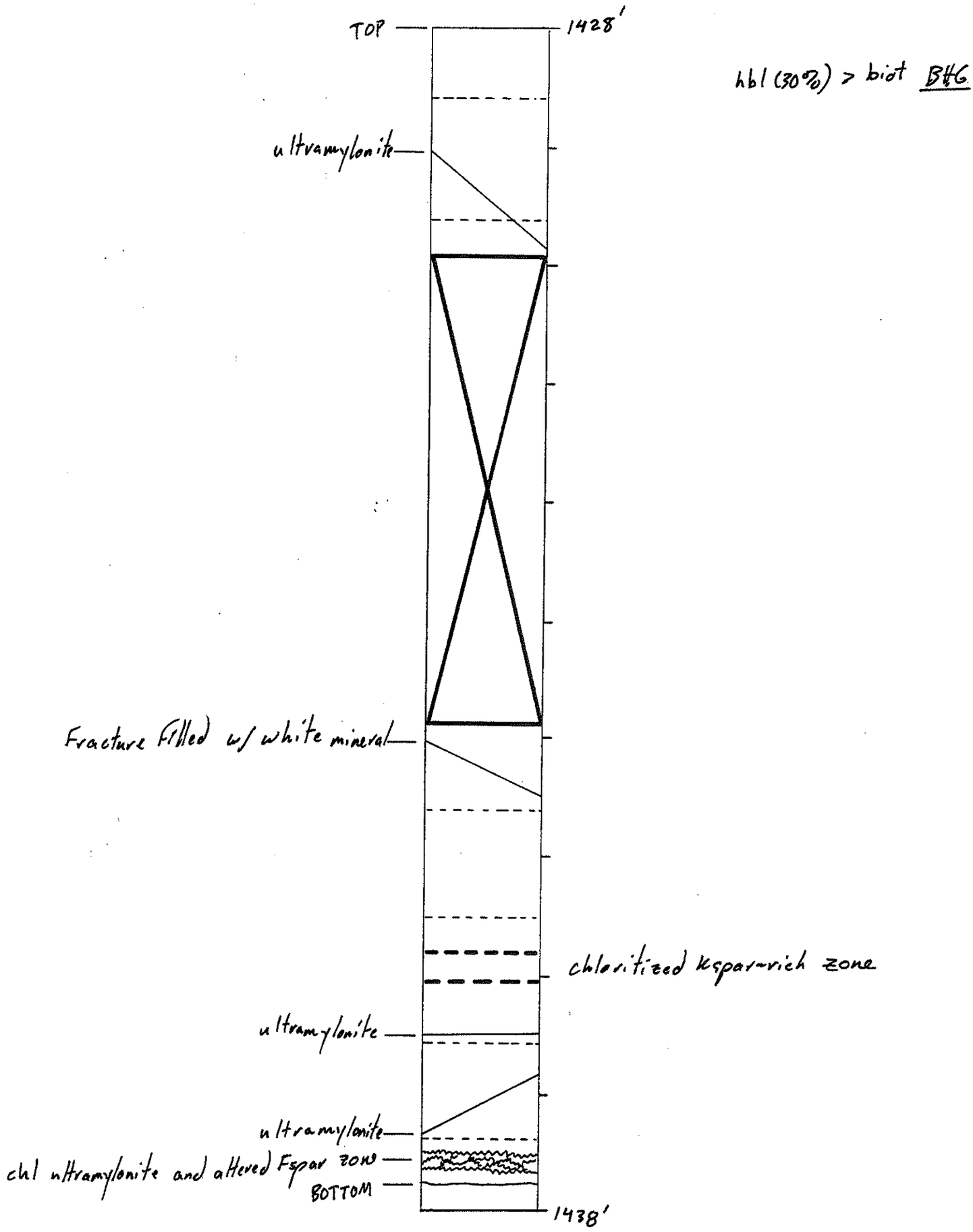


CORE LOG Gillette Castle BOX# 147 INTERVAL 1418.2'- 1428.0'

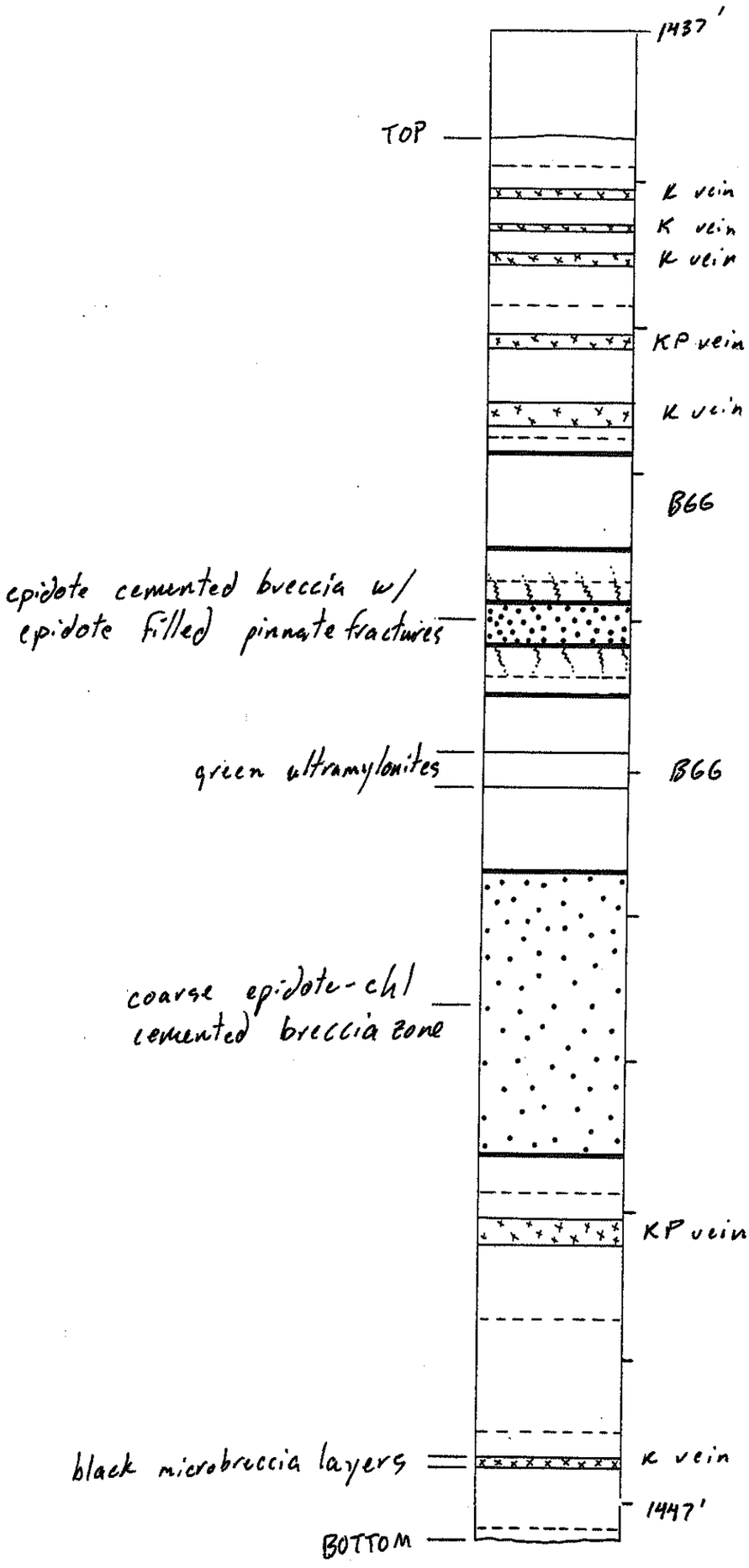


hbl > biot BHG.

CORE LOG Gillette Castle BOX# 148 INTERVAL 1428.0' - 1437.8'

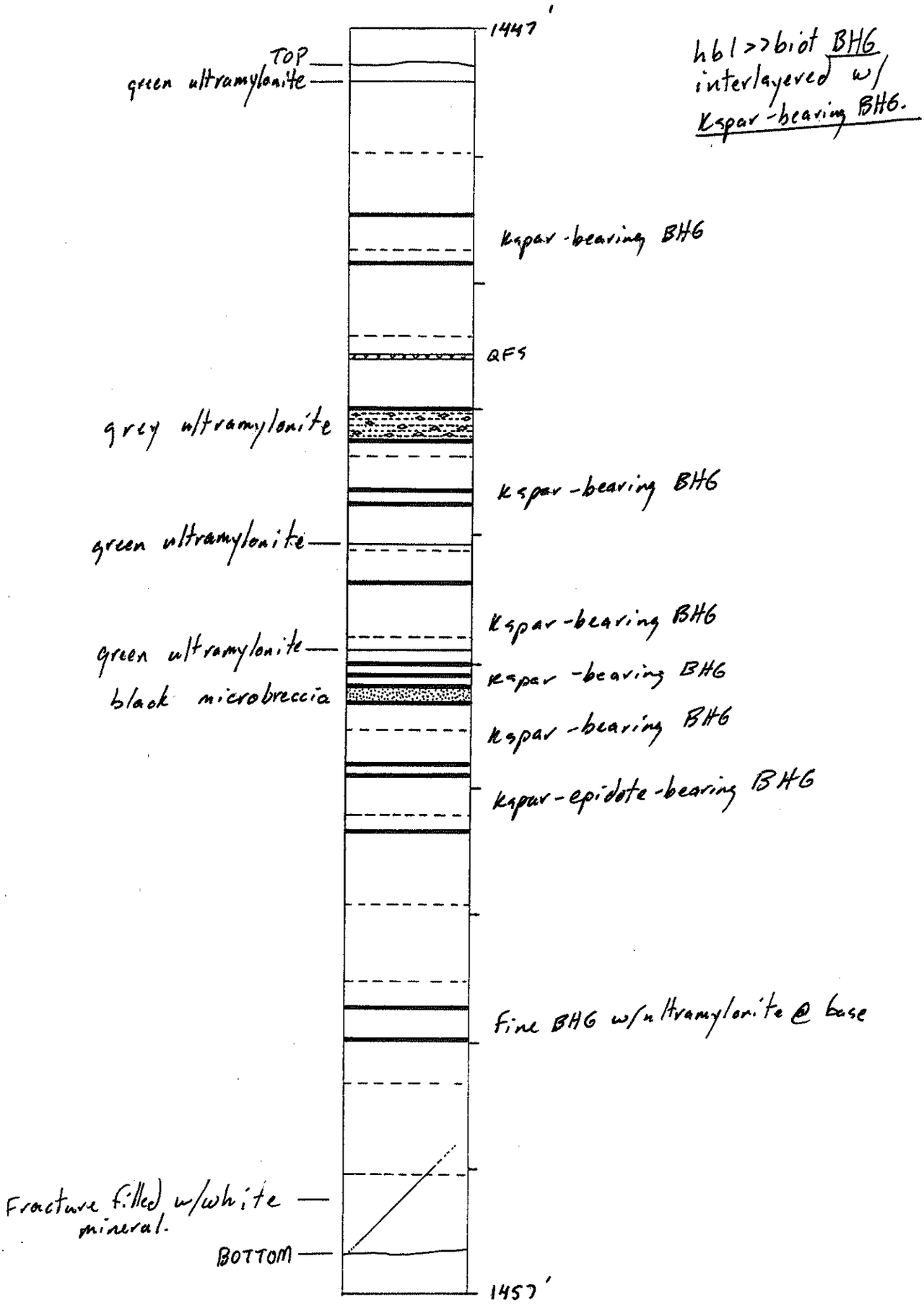


CORE LOG Gillette Castle BOX# 149 INTERVAL 1437.8' - 1447.2'



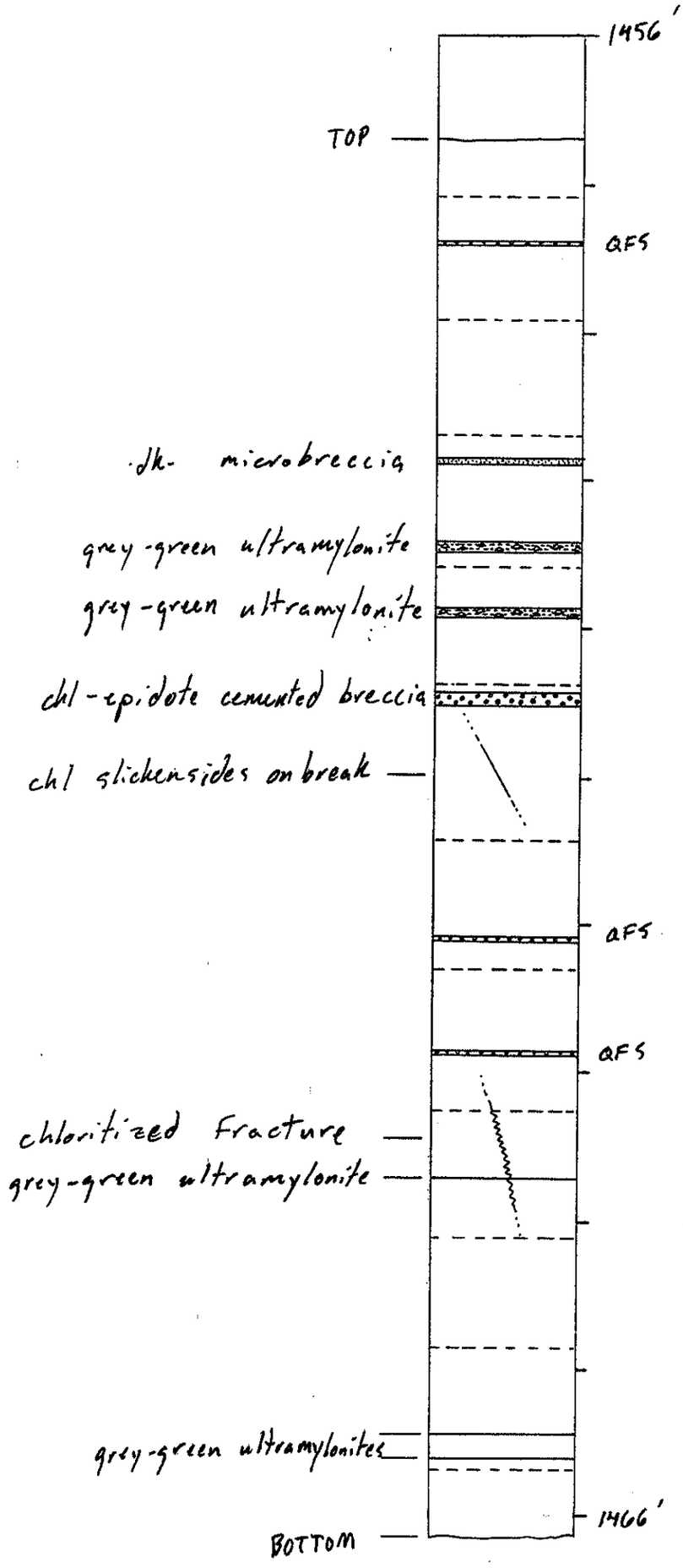
mgt-bearing, hbl > biot BHG w/abundant Kpar layers and BGG

CORE LOG Gillette Castle BOX# 150 INTERVAL 1447.2'-1456.7'

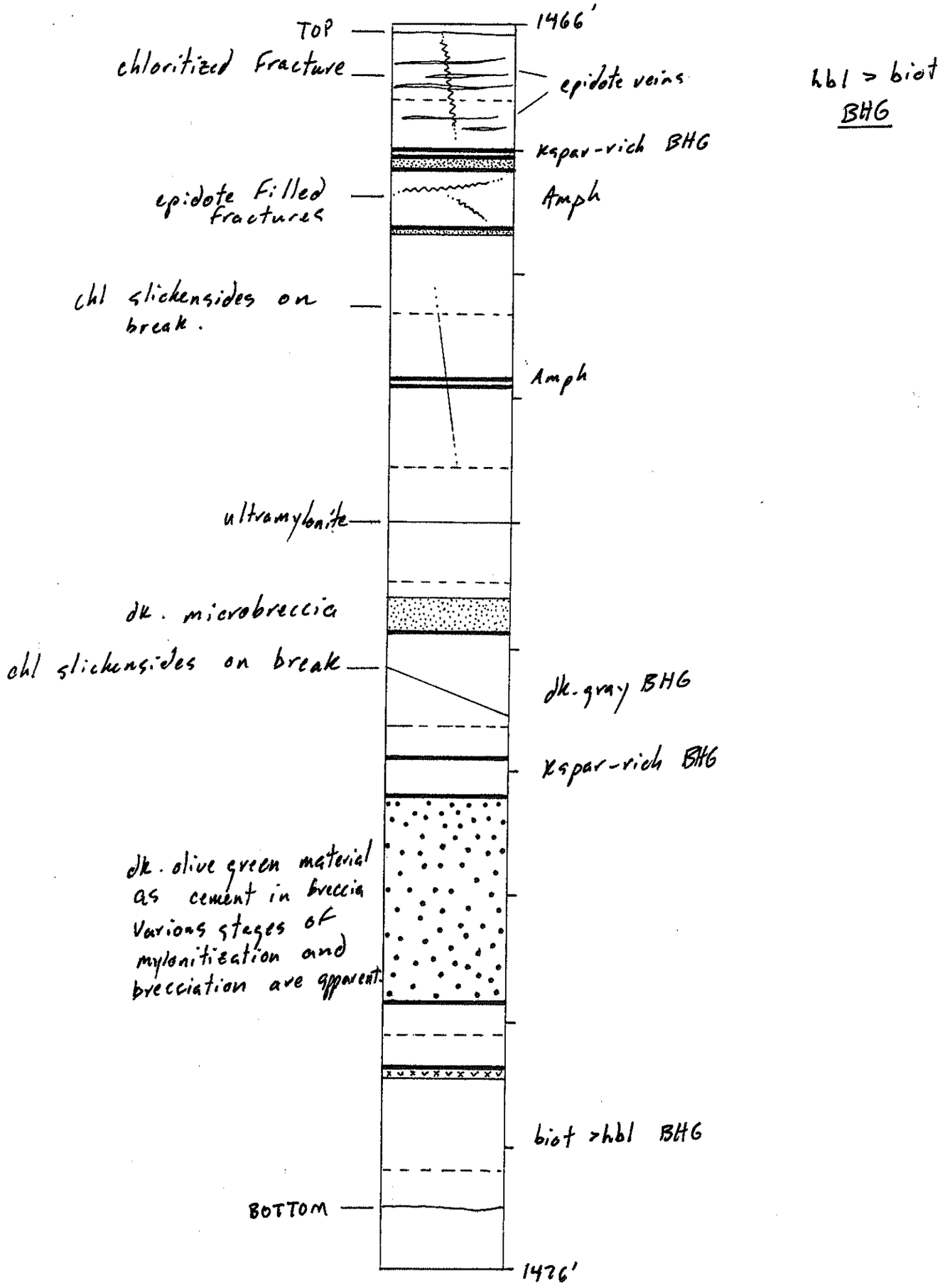


CORE LOG Gillette Castle BOX# 151 INTERVAL 1456.7'-1466.1'

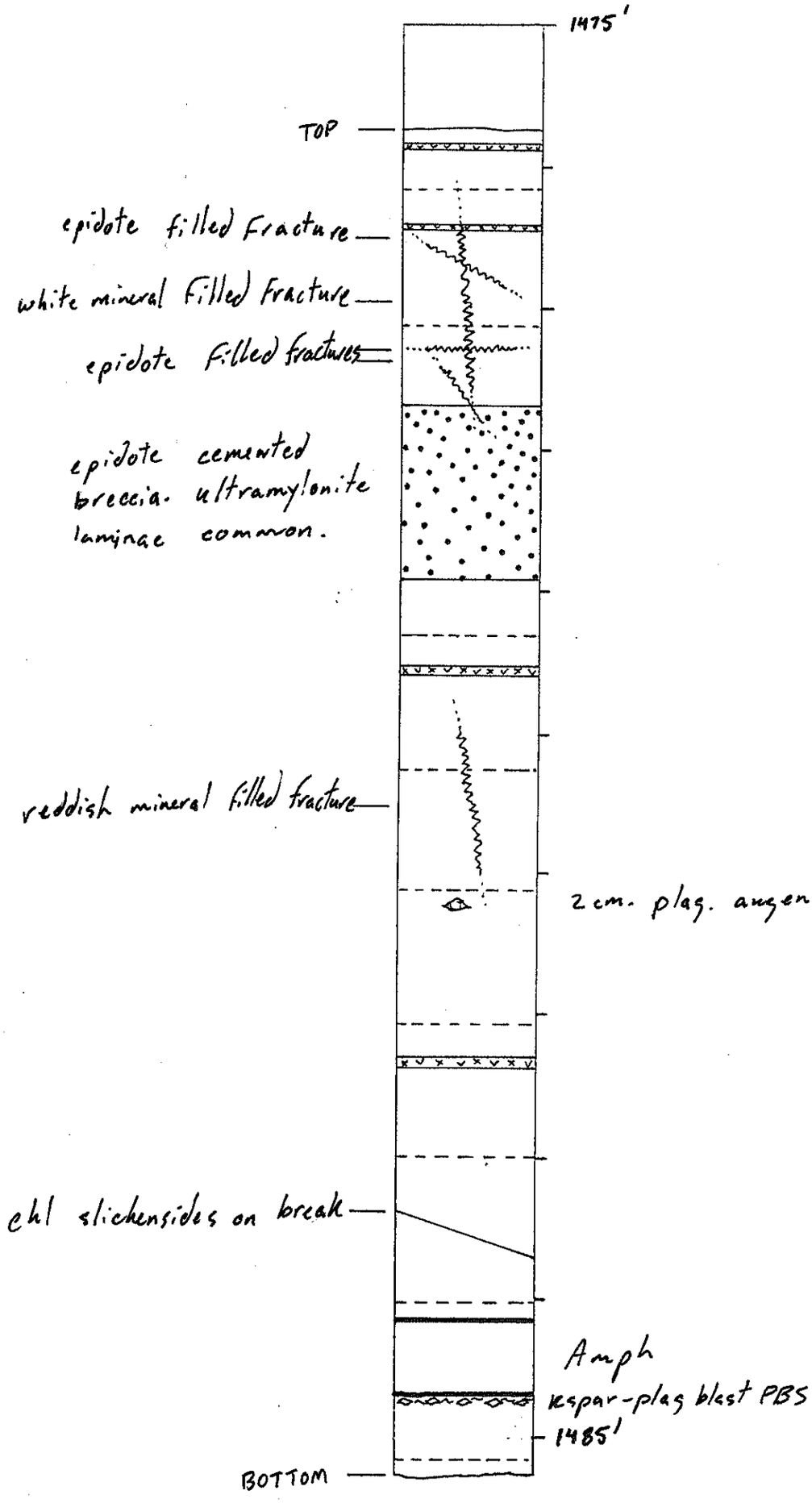
hbl > biot BHG.



CORE LOG Gillette Castle BOX# 152 INTERVAL 1466.1' - 1475.8'



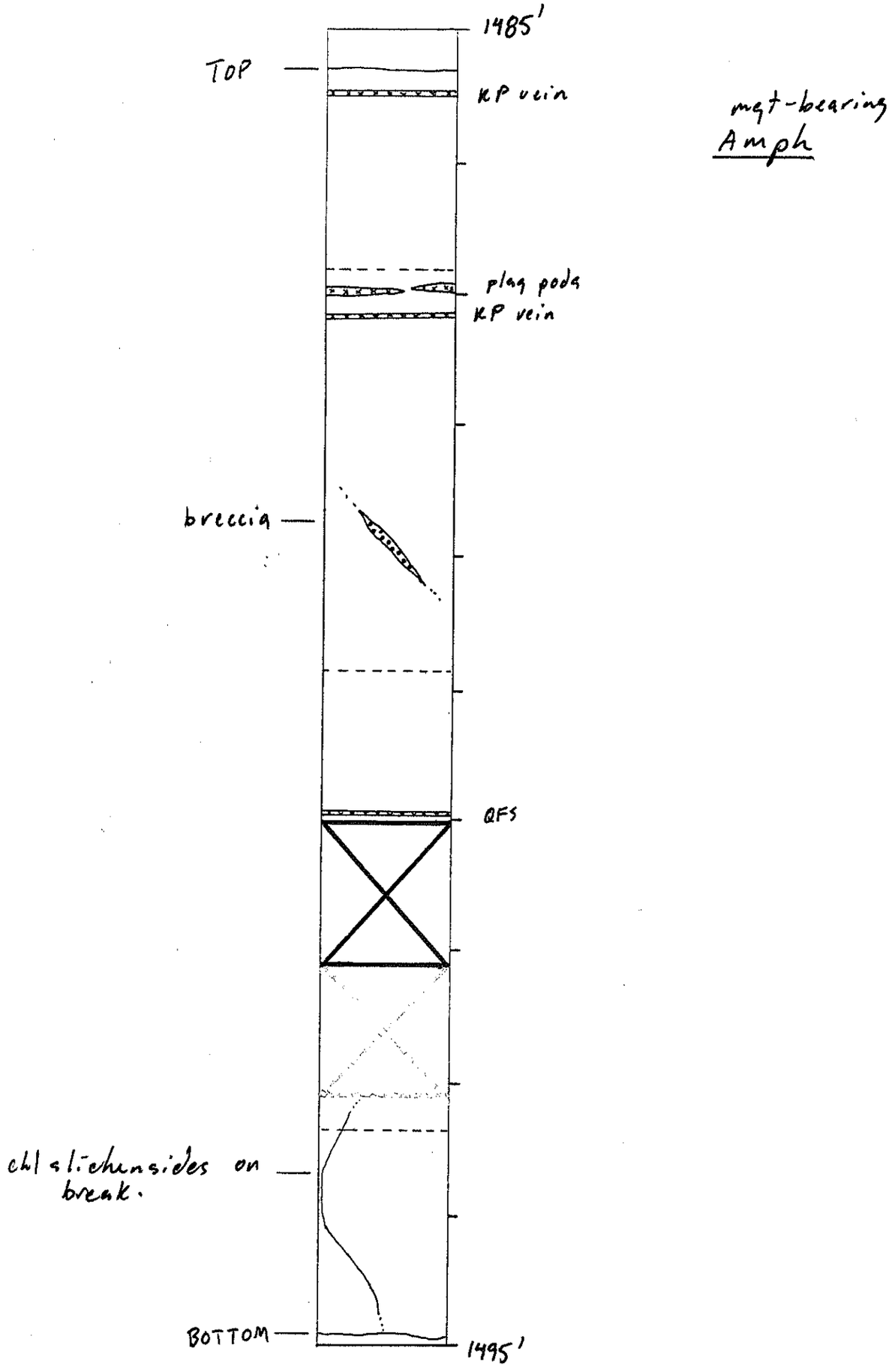
CORE LOG Gillette Castle BOX# 153 INTERVAL 1475.8'-1485.3'



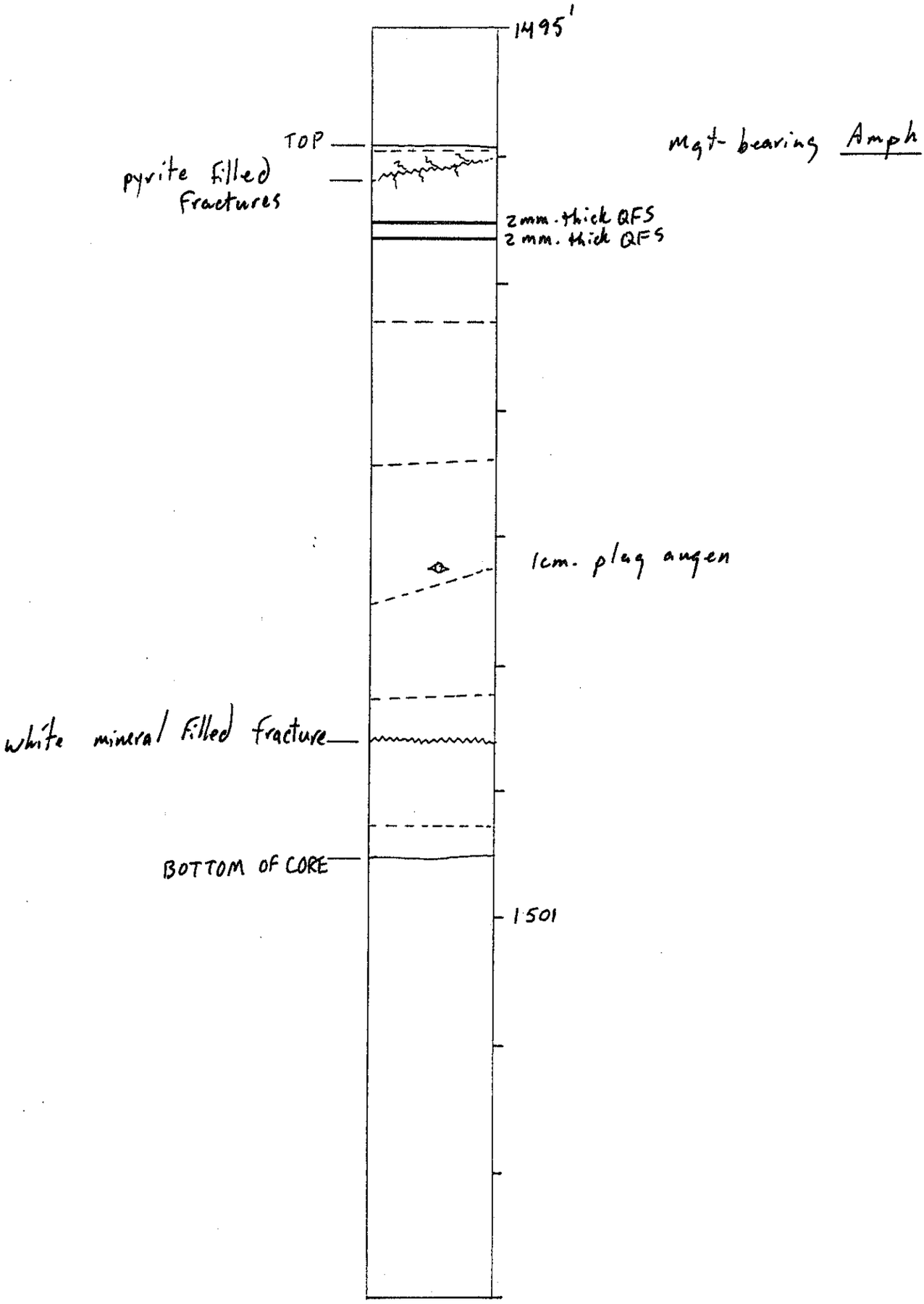
hbl (25%) > biot (10%)

BHG

CORE LOG Gillette Castle BOX# 154 INTERVAL 1485.3' - 1494.9'

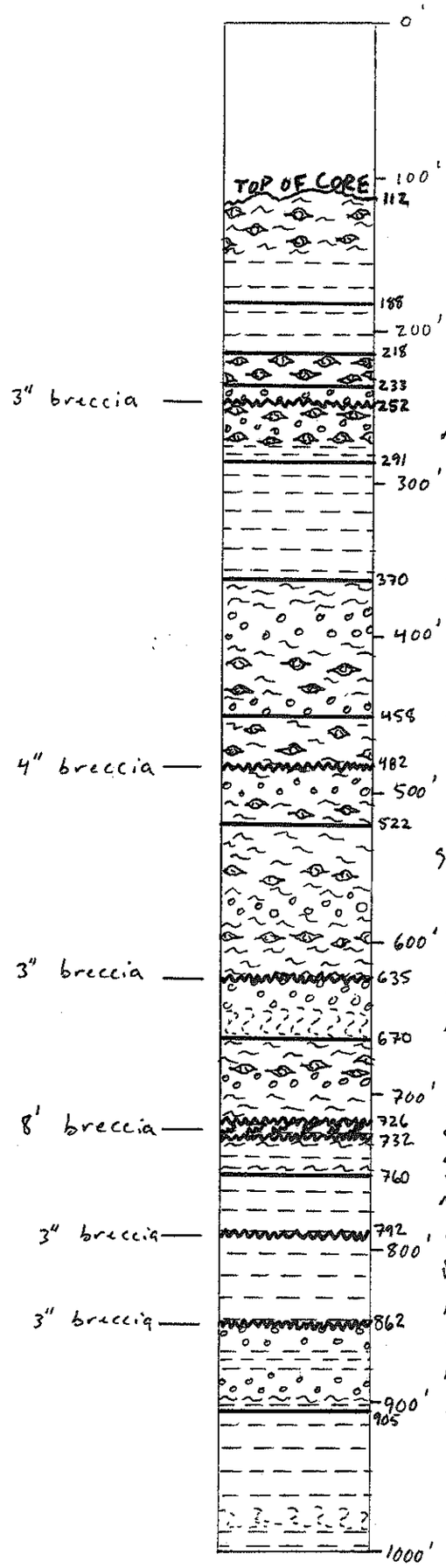
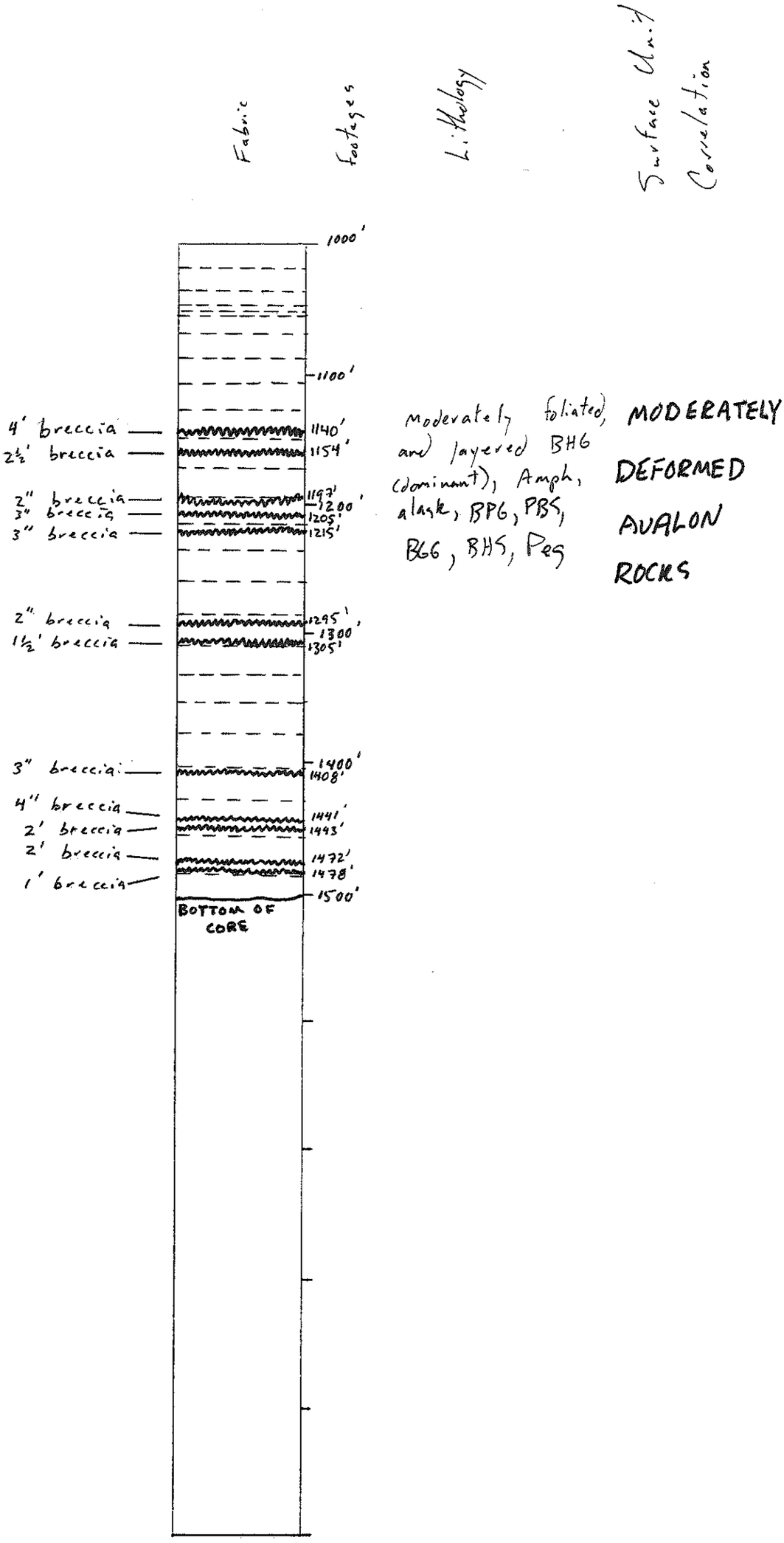


CORE LOG Gillette Castle BOX# 155 INTERVAL 1494.9' - 1500.5'



CORE LOG Gillette Castle BOX# - INTERVAL Summary of Core

Core has pervasive chlorite altered fractures every 5 cm - 50 cm. Only major fractures represented by breccia in the core are shown (~~~~).



CORE LOG Gillette Castle BOX# - INTERVAL Summary of Core