

**Appendix B. Core Log for USGS 140**

**Official Name:** USGS 140

Logged By: M. K. V. Hodges

Selected Aliases: None

USGS Site ID: 43344112581201

Total Core Recovered (ft): 500

County & State: Butte Co., ID

Contractor Well ID: NA

Beginning Depth (ft): 0

Quadrangle Name: North of Scoville

Drilling Agency: USGS

Ending Depth (ft): 546

Lat / Lng: N43° 34' 40.91", W112° 58' 11.99"

Year Drilled: 2013

Continuous Recovery

Tns / Rng / Sec: T3 N, R 29 E, S23

Names of Drillers: M. Gilbert, J. Blom

Selected Intervals Recovered

UTM Coordinates: Zone 12N 340867.592 4826550.605

Well Status: complete

Total # of Core Boxes: 55

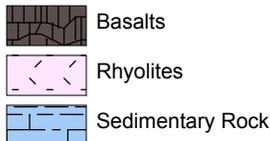
Surface Elevation (ft): 4936.51

Total Depth of Hole (ft): 546

Notes: None

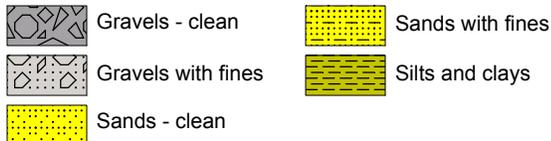
## Core Geological Profile

### Lithologic Patterns

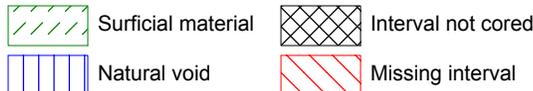


### Soil Patterns

(See Unified Soil Classification System.)

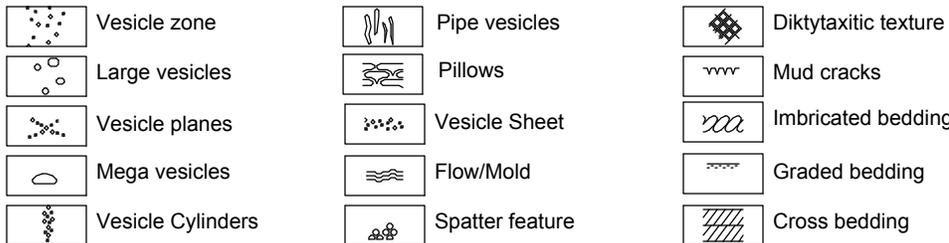


### Intervals in Absentia

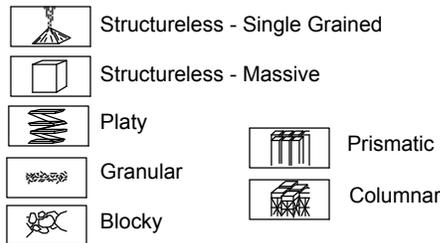


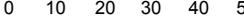
Idaho National Laboratory  
Building CFA-663

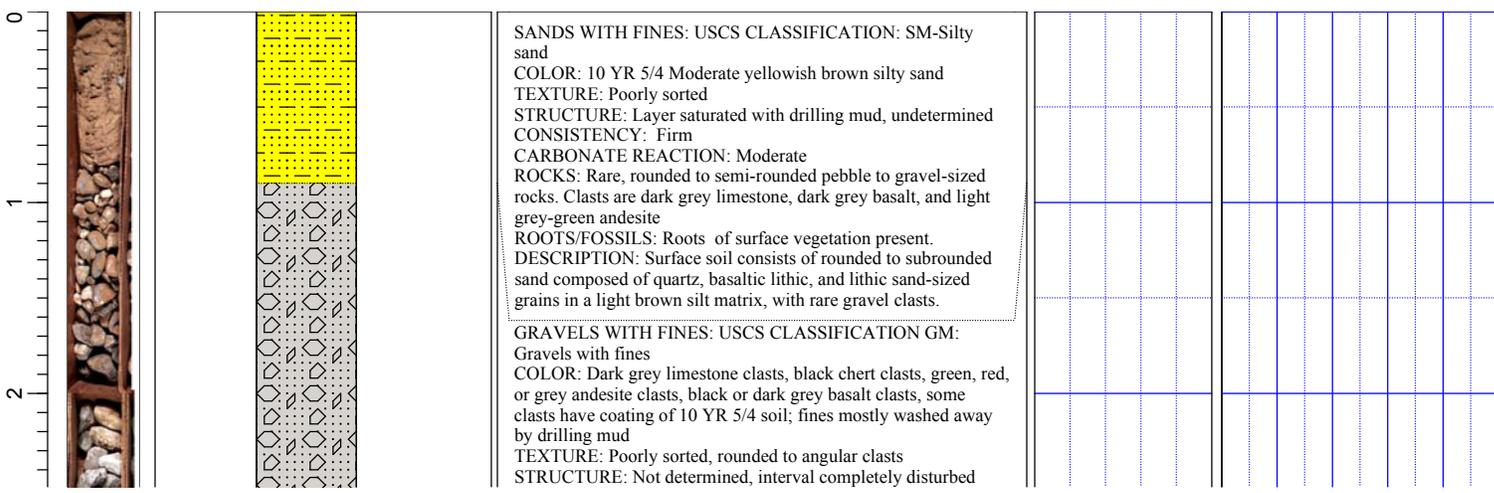
### Igneous and Sedimentary Structure Symbols

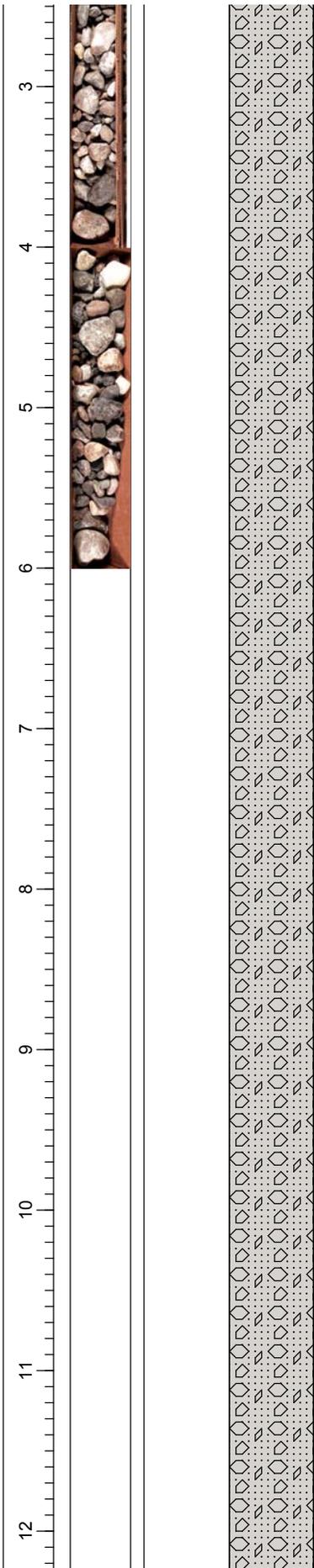


### Soil Structure Symbols

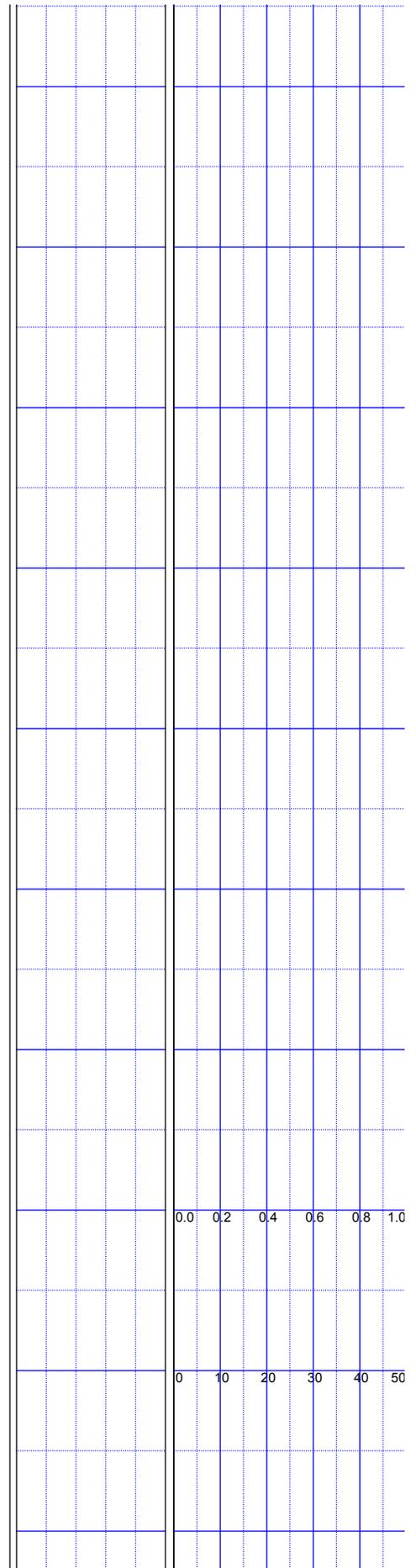


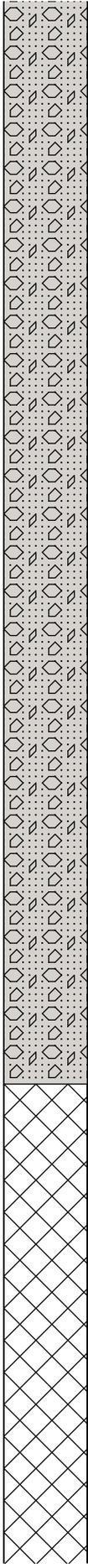
Depth (feet & tenths)	Core Photo	Igneous, Soil and Sed Structures	Lithology	Description		Fracture Frequency <small>(See fracture classification on website.)</small>	Vesicle Characteristics <div style="display: flex; justify-content: space-around;"> <div> <p>—■— Mean Size (in.)</p> <p>0 0.2 0.4 0.6 0.8 1.0</p>  </div> <div> <p>■ Volume Percentage</p> <p>0 10 20 30 40 50</p>  </div> </div>
				Miscellaneous Text	Lithologic Description		



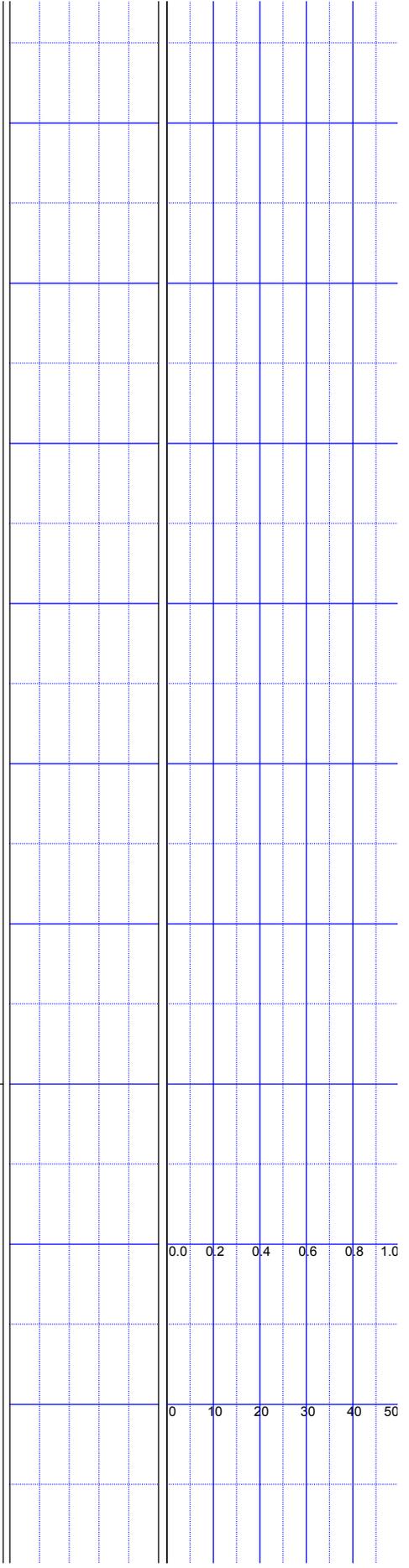


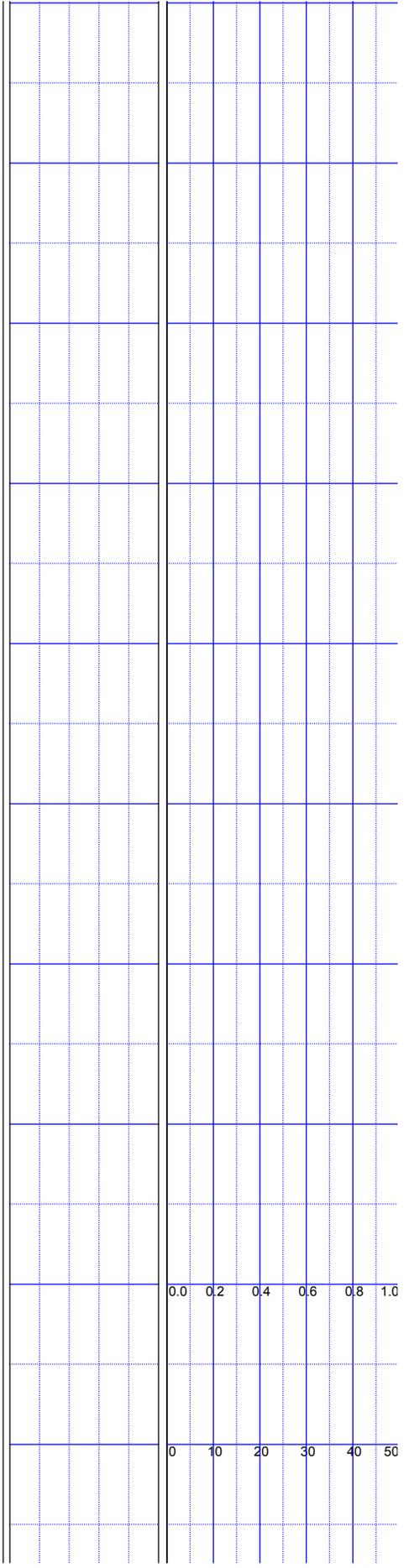
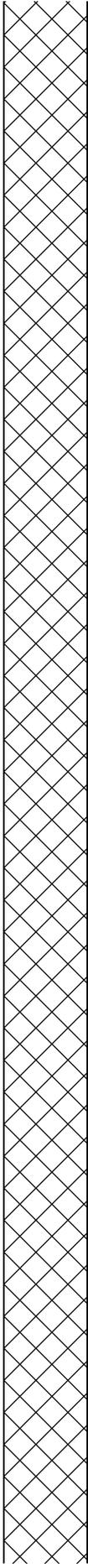
CONSISTENCY: N/A interval totally disrupted by drilling, almost all fines washed out  
CARBONATES: Strong reaction from limestone clasts  
DESCRIPTION: Poorly sorted, loose, pebbles to cobbles, some clasts have coating of fine soil (cuttings indicate that fines were washed away in drilling mud). Clasts are sub-rounded to rounded river gravel largely comprised of limestone, chert, andesite, quartzite, and rare basalt clasts. Nearly all clasts show concussion marks. Incomplete recovery, 5 feet of sediment was recovered from this interval.

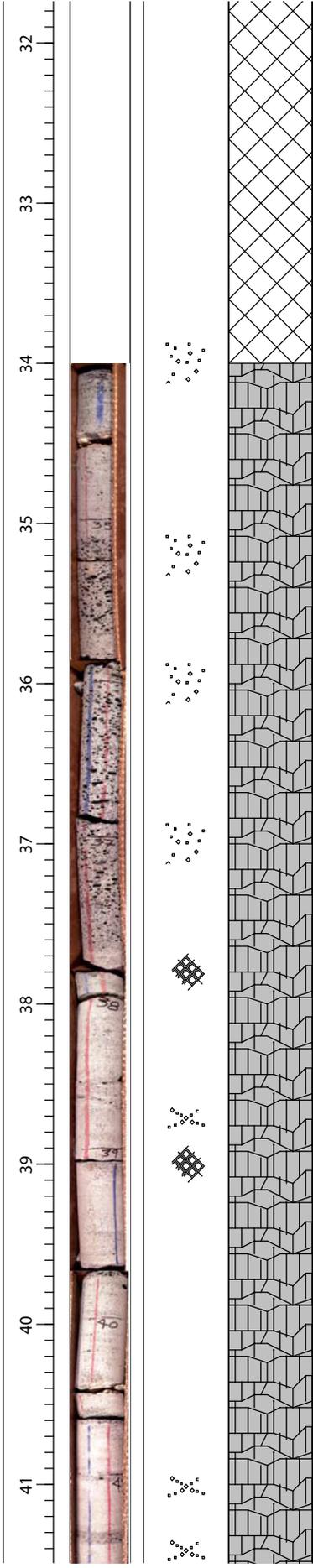




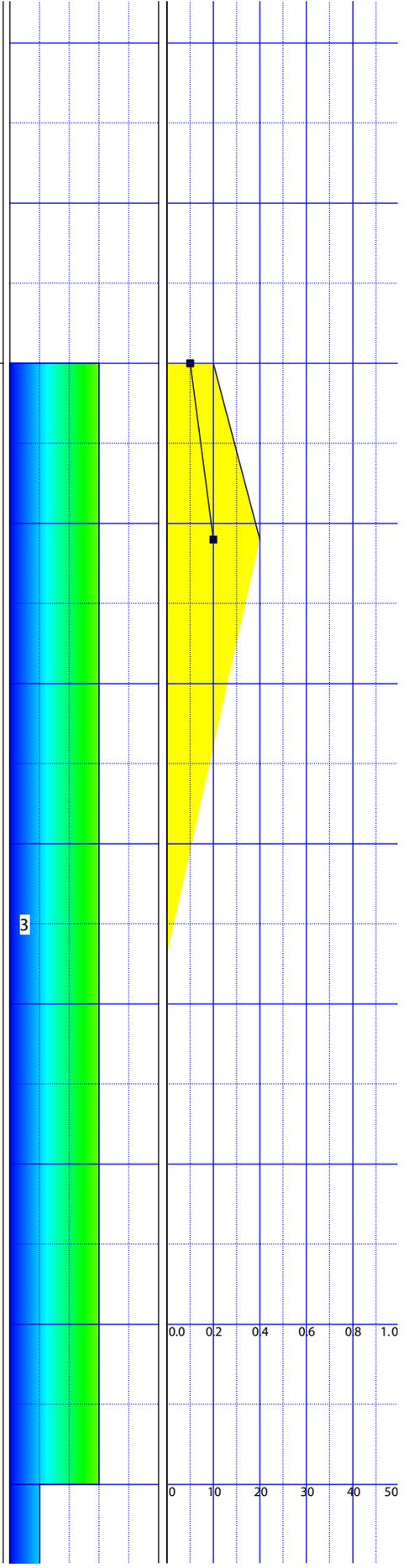
INTERVAL NOT CORED

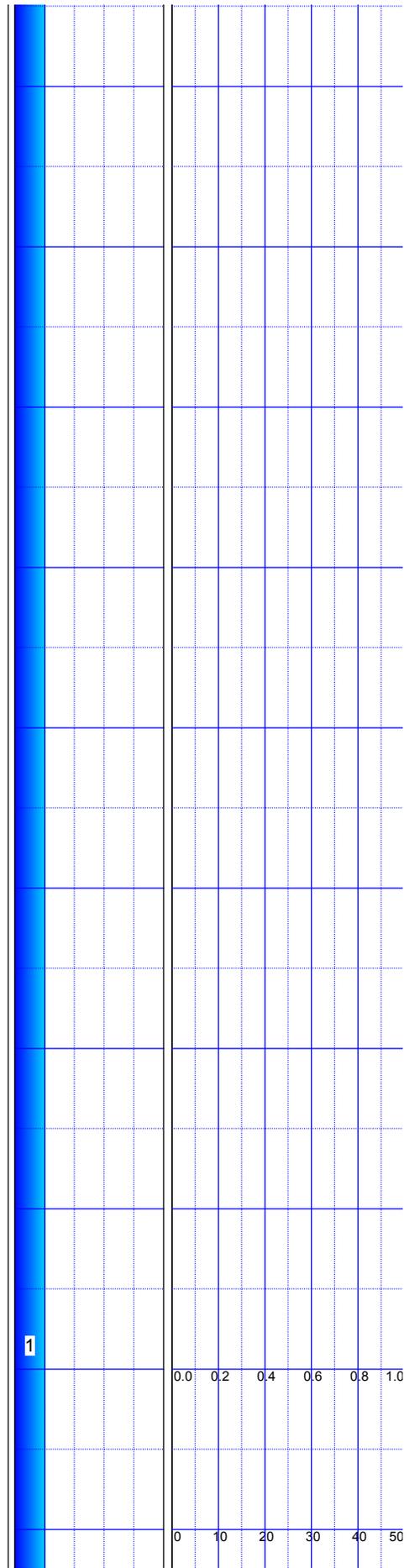
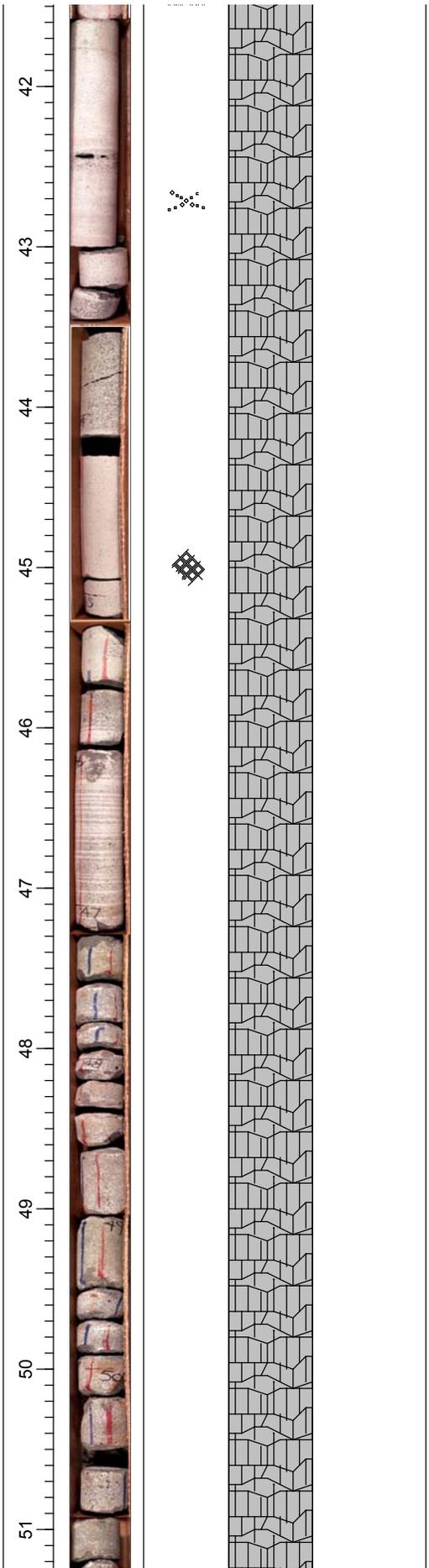


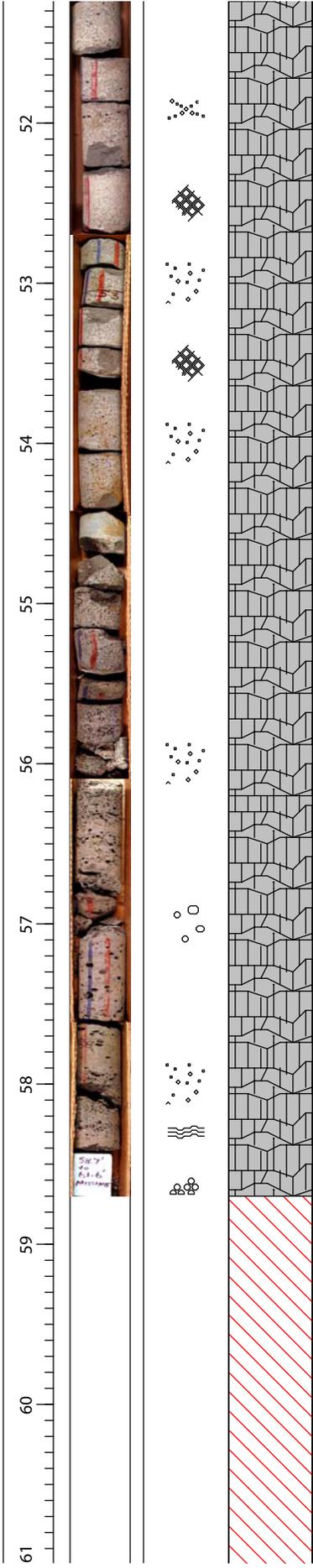




**BASALT: COLOR:** N5 Medium gray  
**TEXTURE:** Aphanitic basalt, vesicular from 34 to 37.8 ft, massive to diktytaxitic from 37.8 to 53.5 ft increasingly vesicular to base at 56.2 ft. Flow structure and rubble at base. Subophitic, under hand lens magnification, 1 mm agglomerations of olivine phenocrysts are visible between lathwork plagioclase phenocrysts, 1-1.5 mm long. Matrix is dark gray, with <0.1 mm granules of a black mineral.  
**COMPOSITION:** 60% euhedral plagioclase microphenocrysts up to 1.5 mm long 0.5 mm wide, 30% subhedral to anhedral 0.5-1 mm olivines, 5% anhedral black mineral, remainder is cryptocrystalline matrix  
**XENOLITHS/AUTOLITHS:** None noted  
**ALTERATION:** 10 YR 8/2 very pale orange mineral encrusts some fractures, carbonate-rich reacts strongly to acid. Reddish oxidation on surfaces at base, non-carbonate white film on fracture surfaces and in vesicles at base

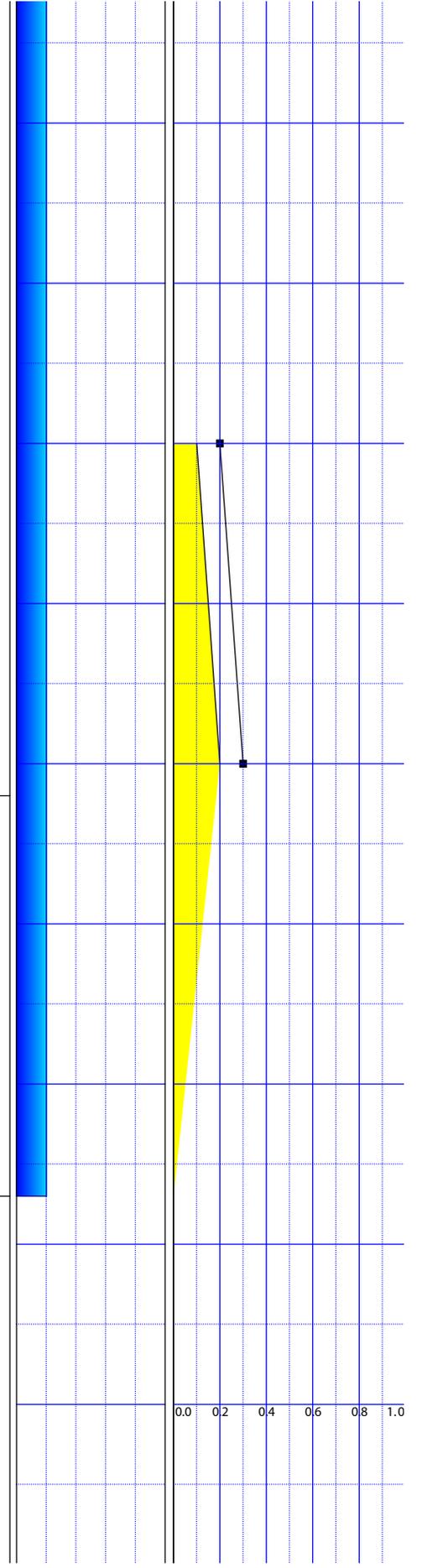


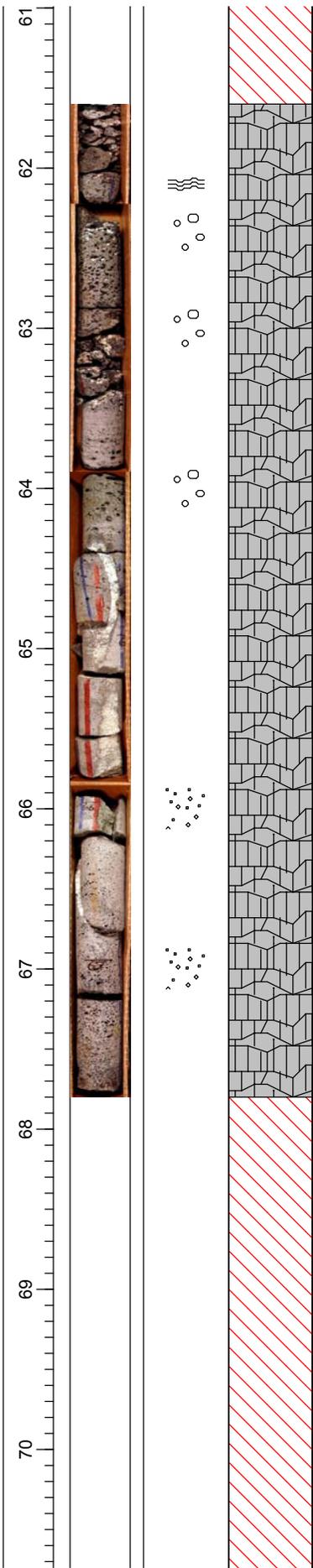




BASALT: COLOR: 5YR 6/1 brownish gray  
 TEXTURE: Aphanitic, subophitic, basalt, with (large 2-10 mm), sparse vesicles. Spatter structure and rubble at base.  
 COMPOSITION: 35% euhedral to subhedral plagioclase microphenocrysts < 0.5 mm long, 25% anhedral olivine microphenocrysts  
 XENOLITHS/AUTOLITHS: None noted  
 ALTERATION: White non-calcareous film on fractures near base of interval, slight alteration of olivine to reddish iddingsite

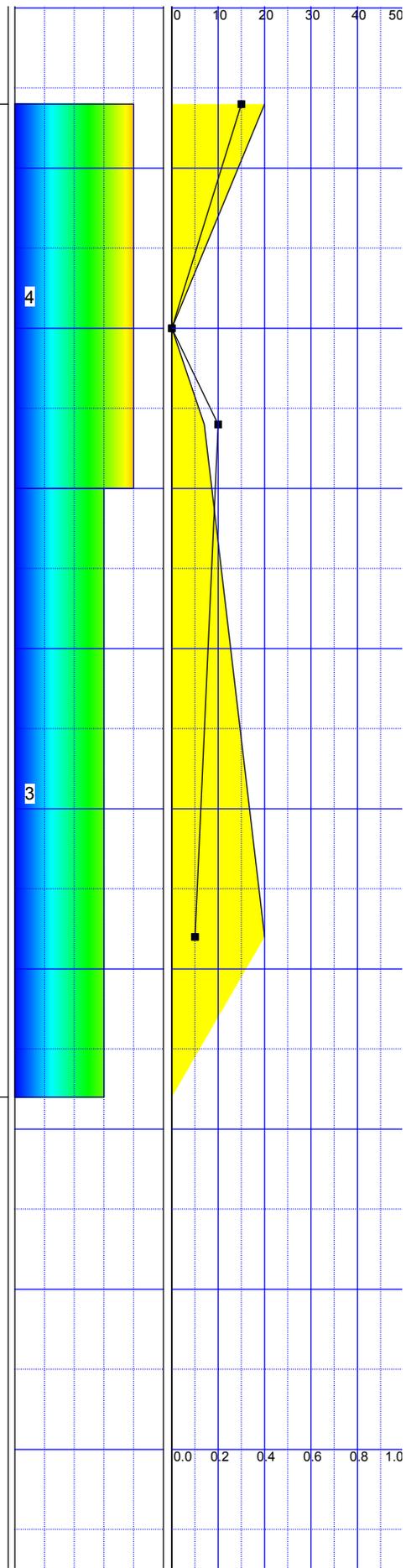
MISSING INTERVAL: Missing, no other information

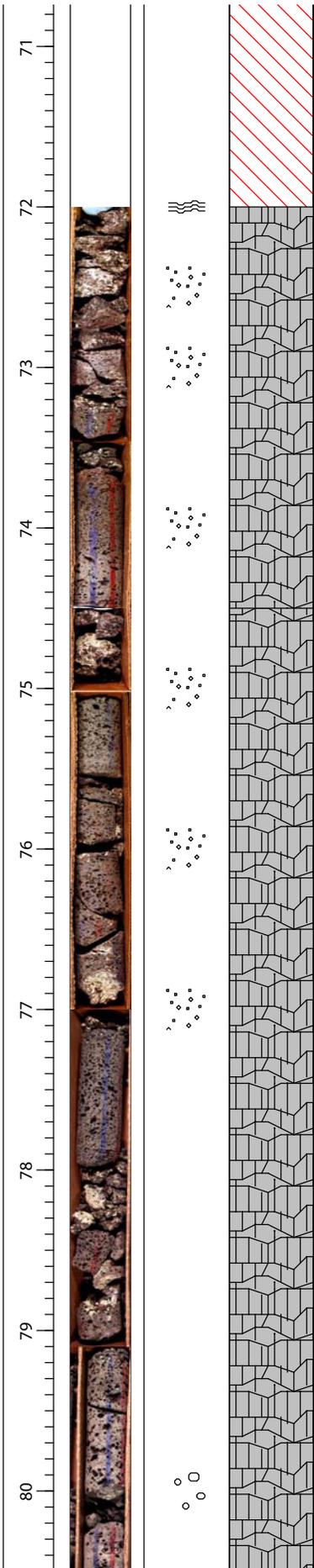




**BASALT: COLOR:** 5YR 6/1 Brownish gray  
**TEXTURE:** Aphanitic, subophitic, basalt, top of interval is rubble, (large 2-10 mm), sparse vesicles to 63.2 ft. From 63.2 to 63.7 feet, core retrieved is rubble coated with non-calcareous white to cream-color, dull, massive mineral. From 63.7 ft to 65, vesicles decrease in size and number. At 65 ft, massive texture; increasingly vesicular from 66 ft to base of interval. Spatter structure and rubble at base coated with white non-calcareous film.  
**COMPOSITION:** 35% euhedral to subhedral plagioclase microphenocrysts < 0.5 mm long, 25% anhedral olivine microphenocrysts  
**XENOLITHS/AUTOLITHS:** None noted  
**ALTERATION:** White non-calcareous film on fractures near top and base of interval, calcareous film on fracture at 65 ft, slight alteration of olivine to reddish iddingsite

MISSING INTERVAL

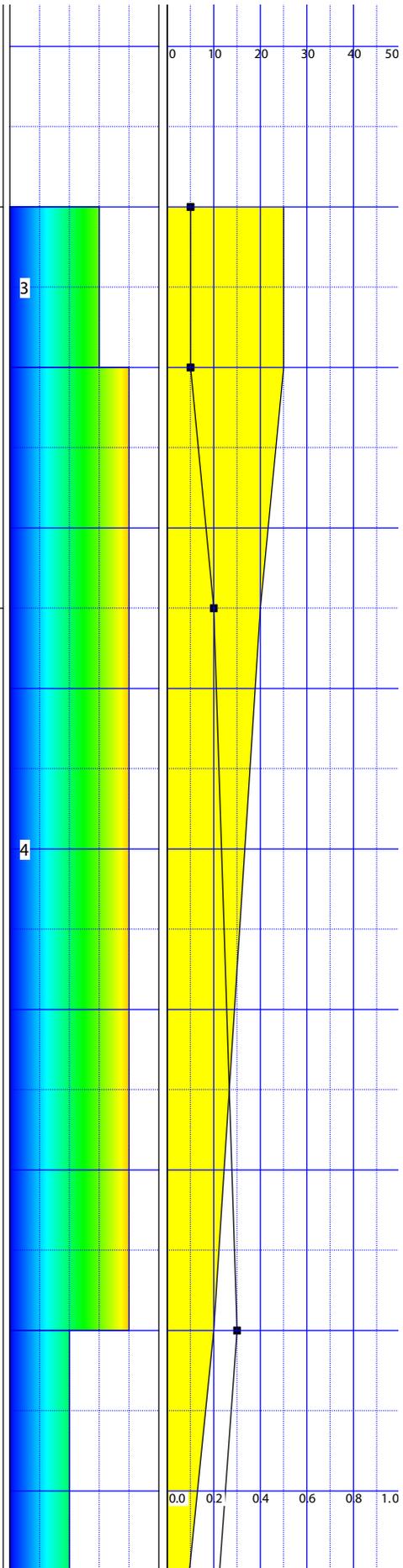


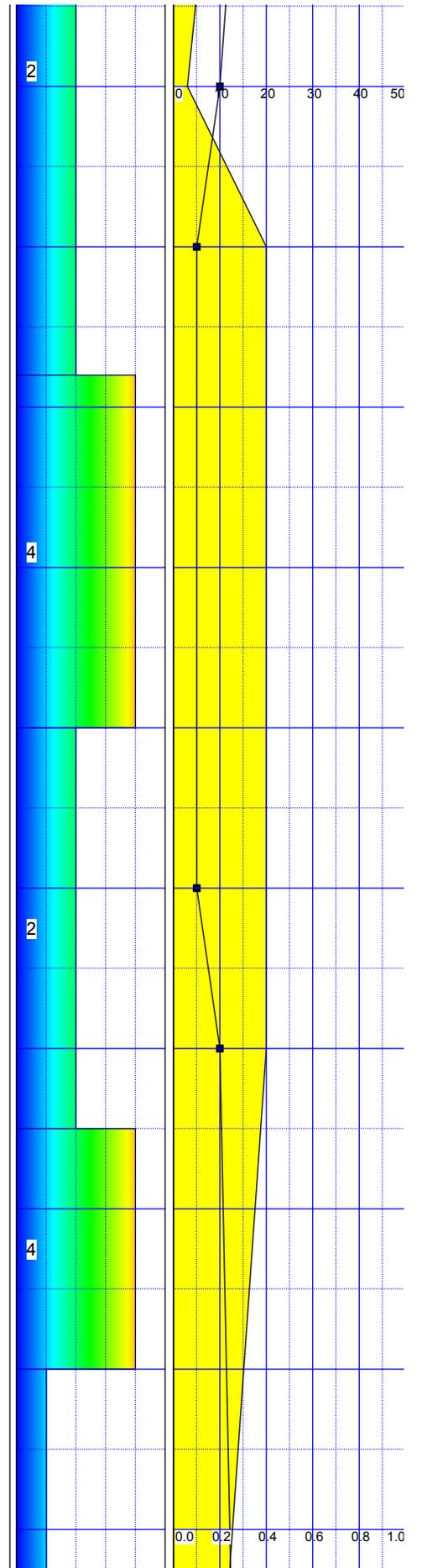
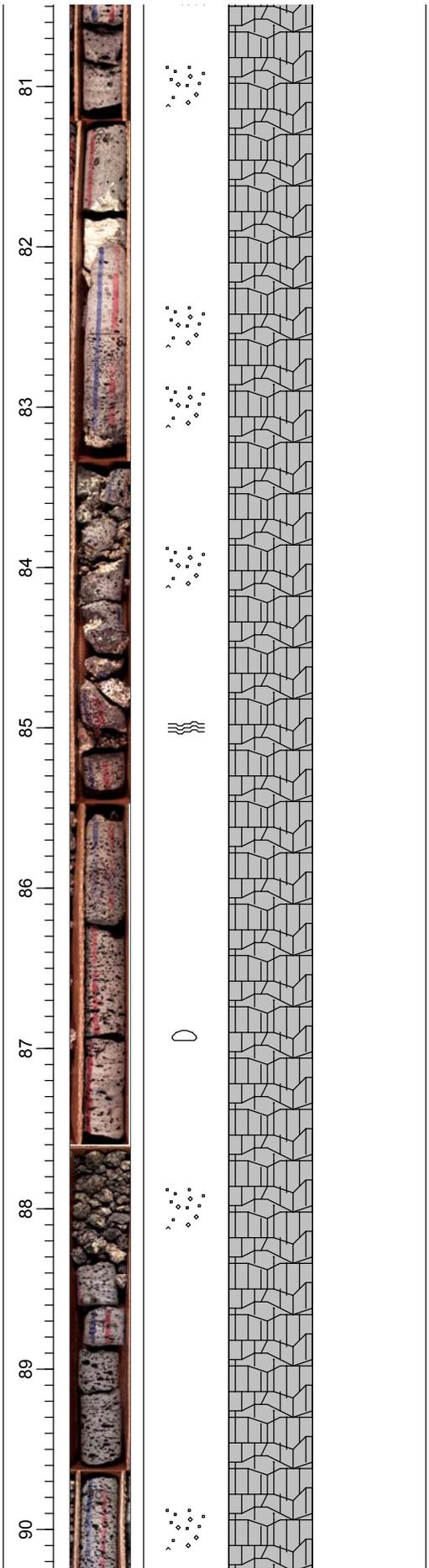


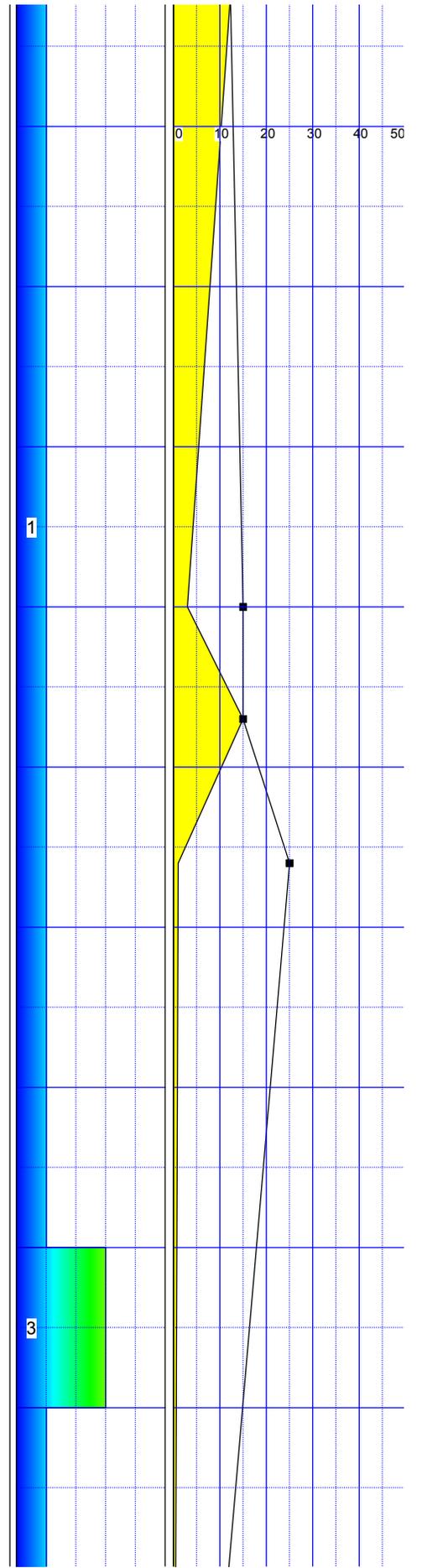
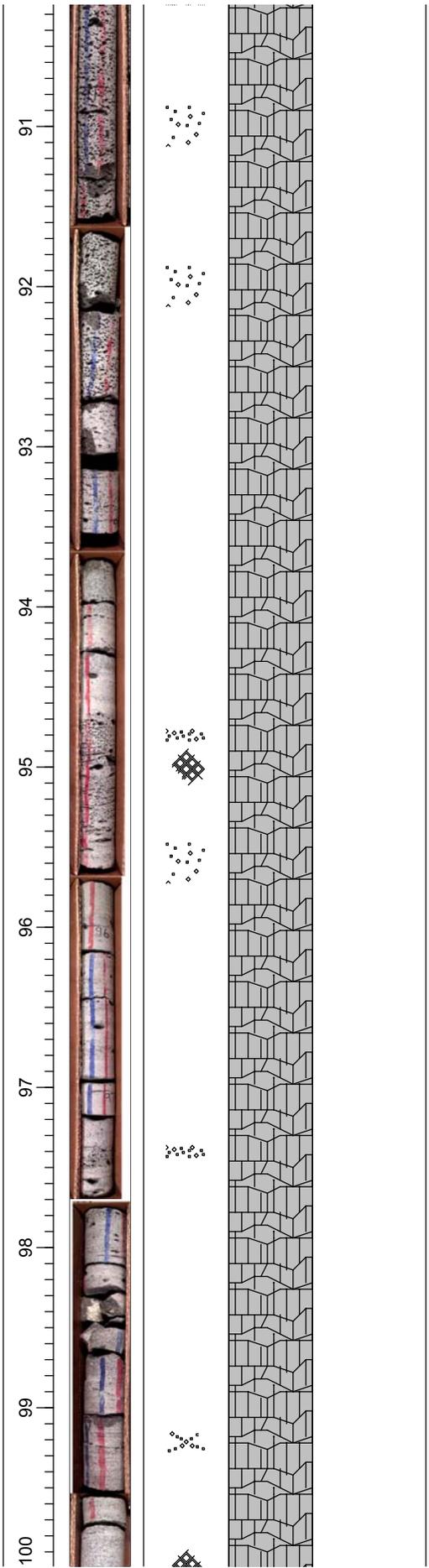
**BASALT: COLOR:** 5YR 6/1 Brownish gray  
**TEXTURE:** Aphanitic, subophitic, basalt, top of interval is rubble, core retrieved is rubble coated with non-calcareous white to cream-color, dull, massive mineral.  
**COMPOSITION:** 35% euhedral to subhedral plagioclase microphenocrysts < 0.5 mm long, 25% anhedral olivine microphenocrysts  
**XENOLITHS/AUTOLITHS:** None noted  
**ALTERATION:** White non-calcareous film on fractures near top and base of interval, slight alteration of olivine to reddish iddingsite

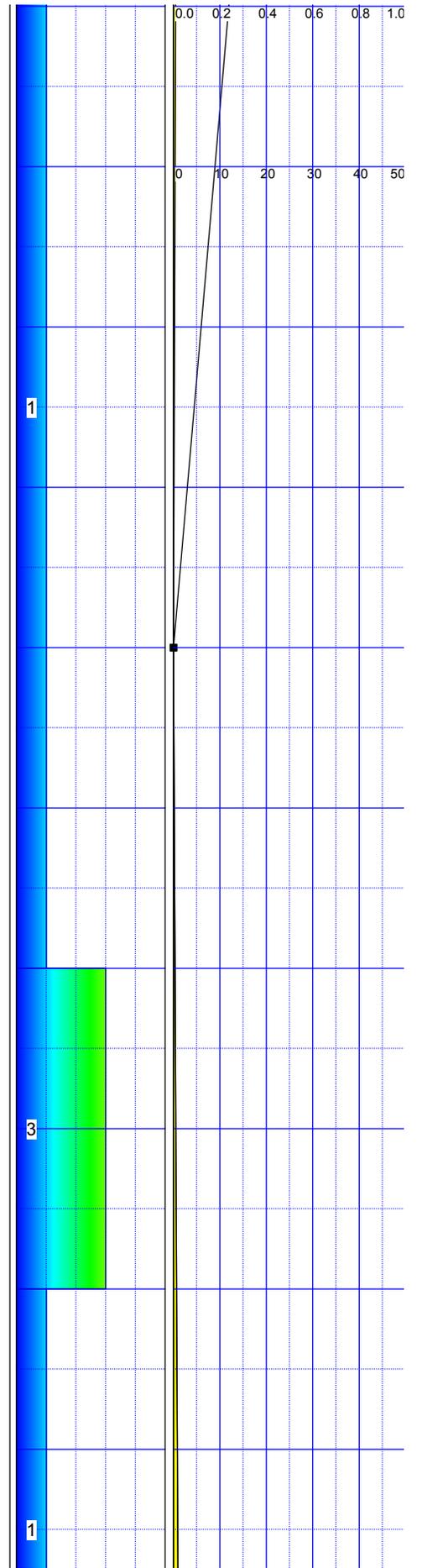
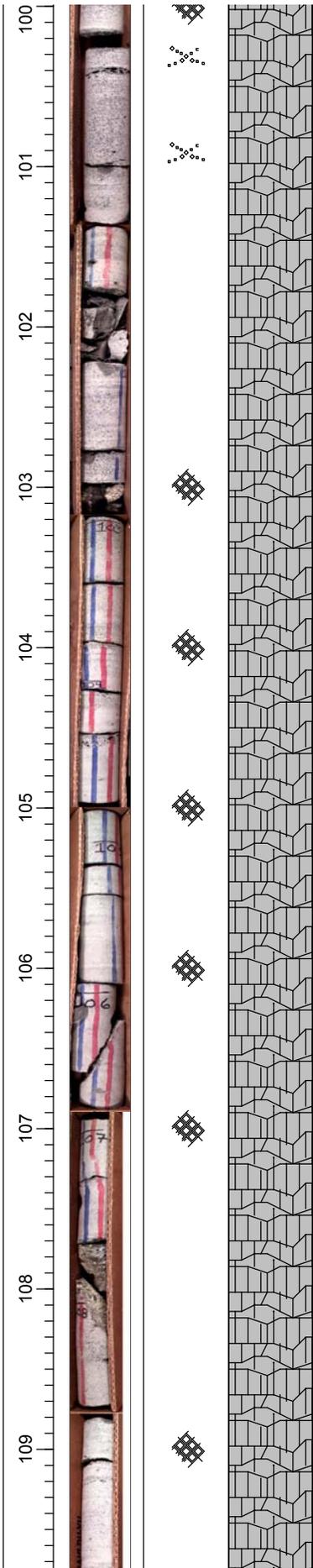
Note: This interval and the next interval contained mostly rubble, and depths may be off by as much as one foot.

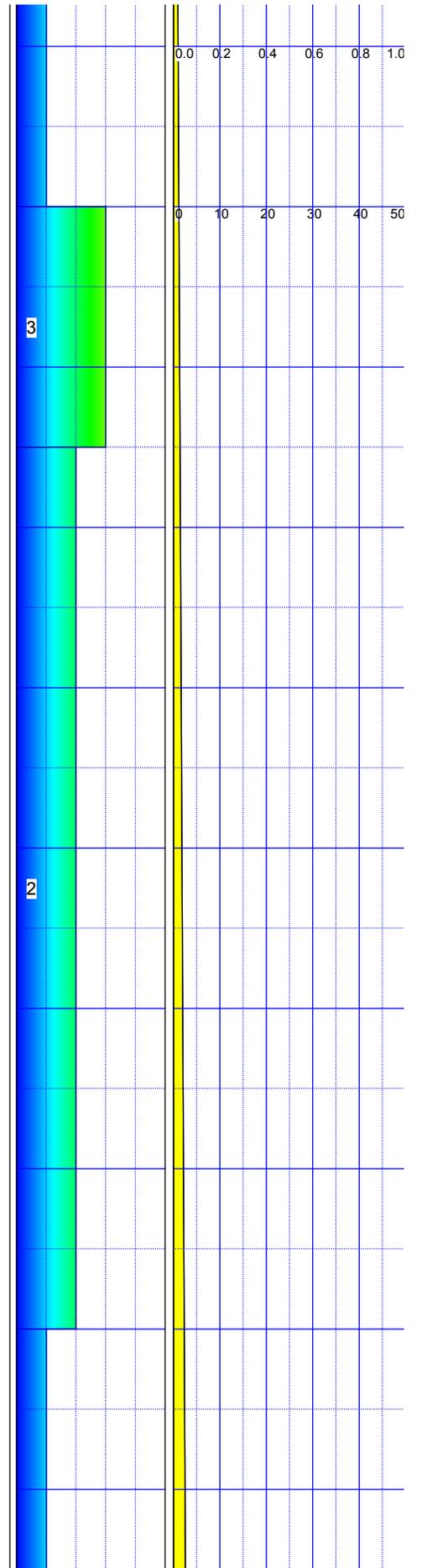
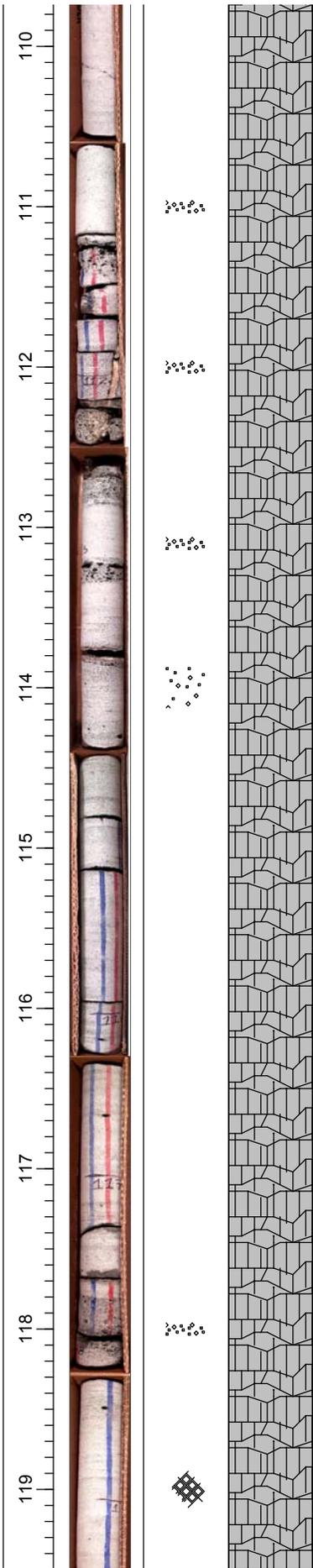
**BASALT: COLOR:** N4 medium dark grey to N5 medium grey  
**TEXTURE:** Aphanitic, subophitic, basalt. Flow structure at top of interval; rubble intervals at 72, 78, 84, 88, ft. Vesicular from 72 to 95.7 ft, diktytaxitic with megavesicles and vesicle planes from 95.7 to 104 ft, massive with vesicle planes from 104 to 119 ft, diktytaxitic from 119 to 139 ft, massive from 139 to 148.5 ft, increasingly vesicular from 148.5 ft to base of interval. Glomerocrysts of olivine microphenocrysts may be up to 5 mm. Spatter structure and rubble at base.  
**COMPOSITION:** 50% euhedral to subhedral plagioclase microphenocrysts < 0.5 mm long, 30% anhedral olivine microphenocrysts, 10 % black anhedral mineral  
**XENOLITHS/AUTOLITHS:** None noted  
**ALTERATION:** Vesicle interiors, rubble coated with thin film of dull, white or buff mineral, material does not contain carbonate; reddish oxidation at base

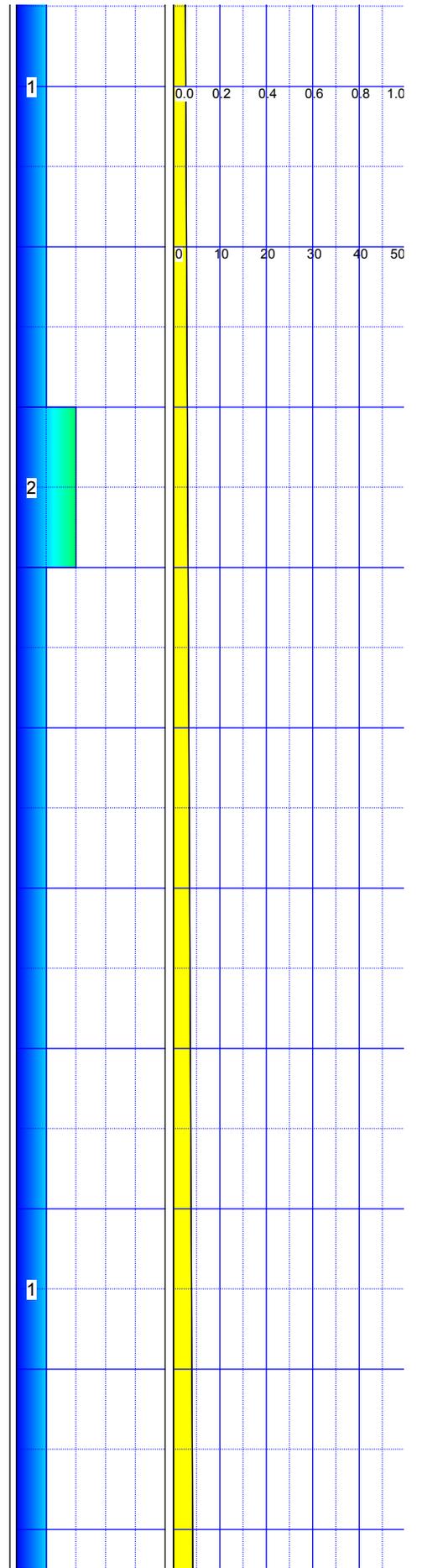
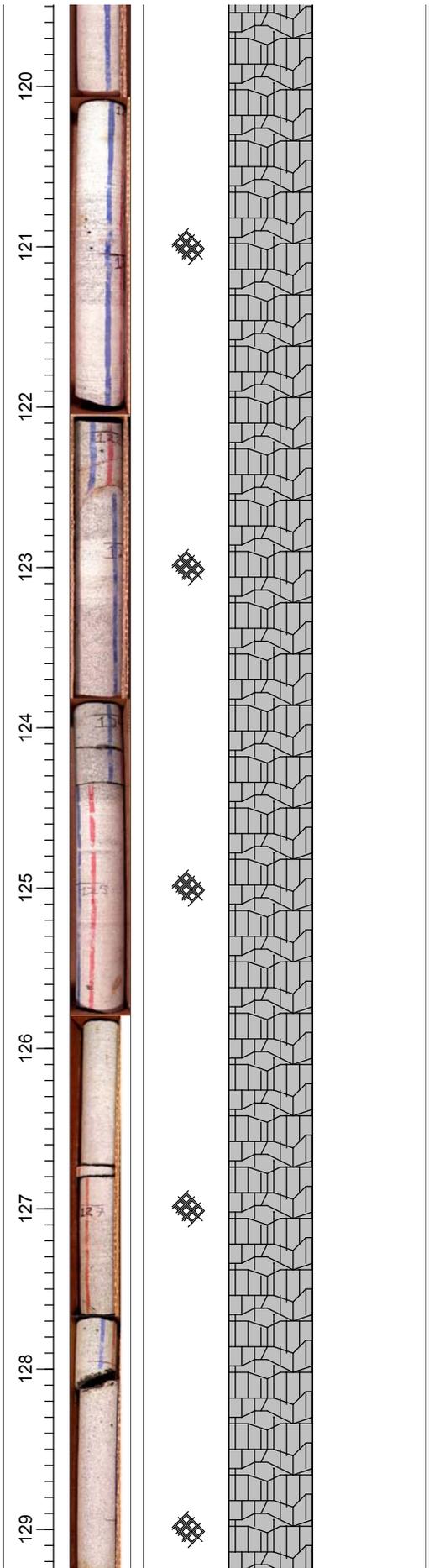


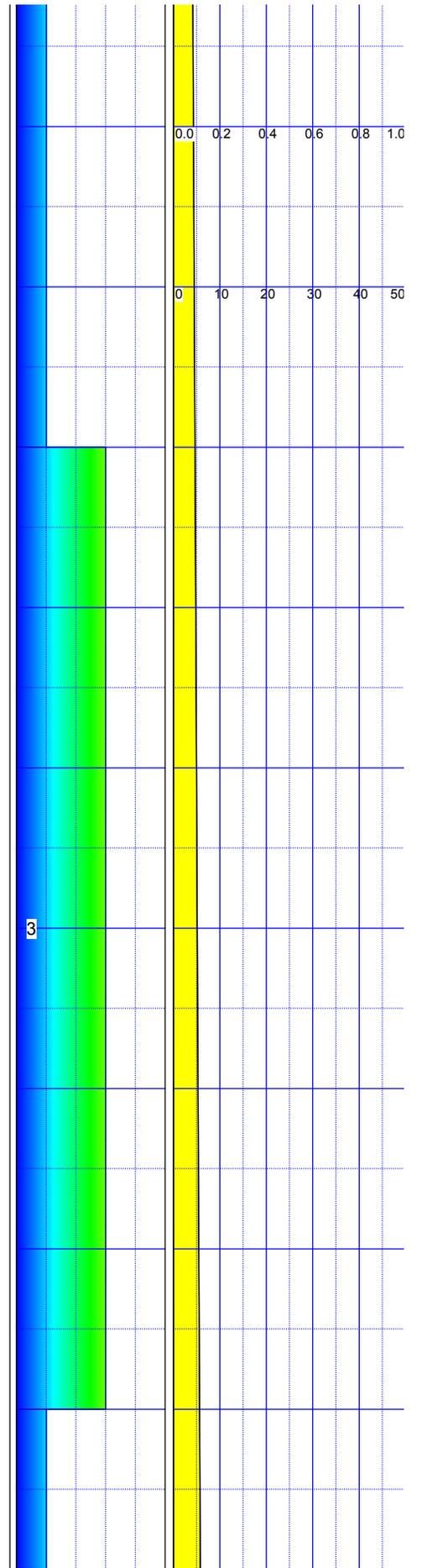
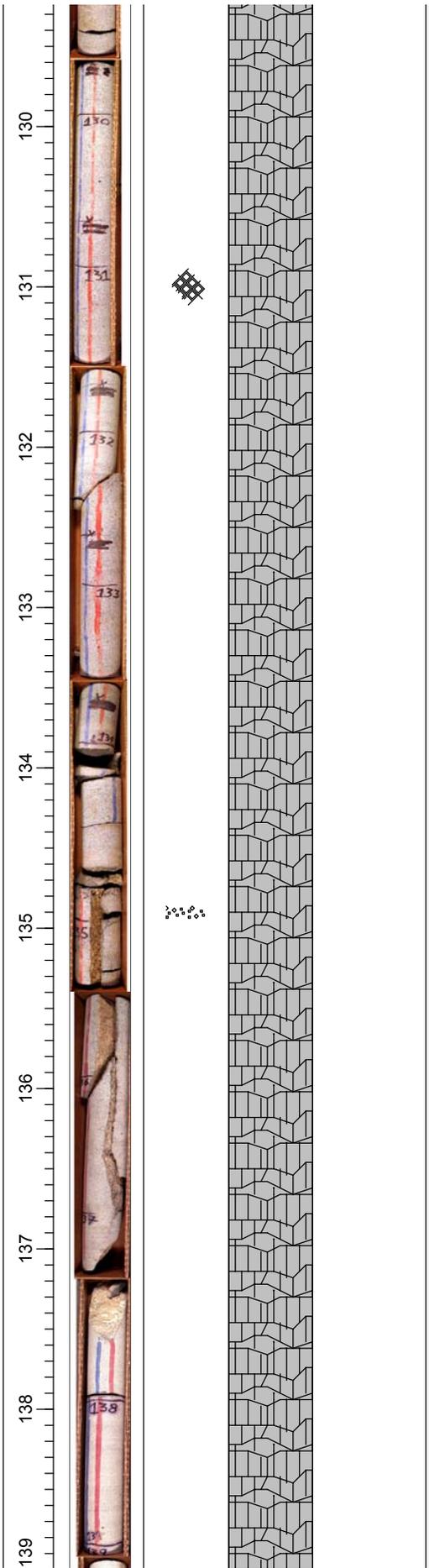


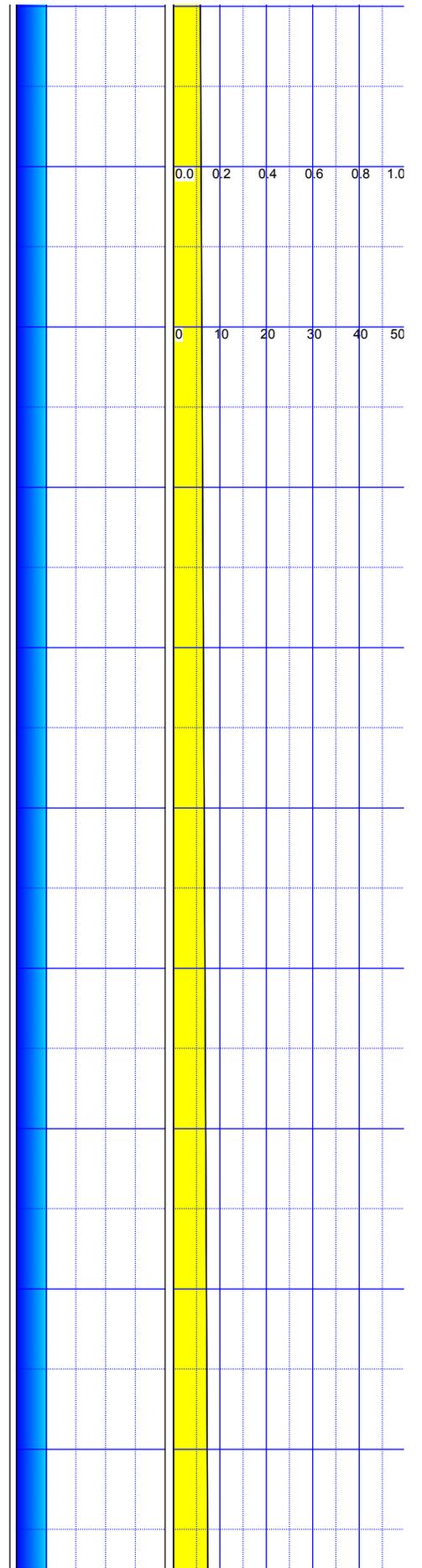
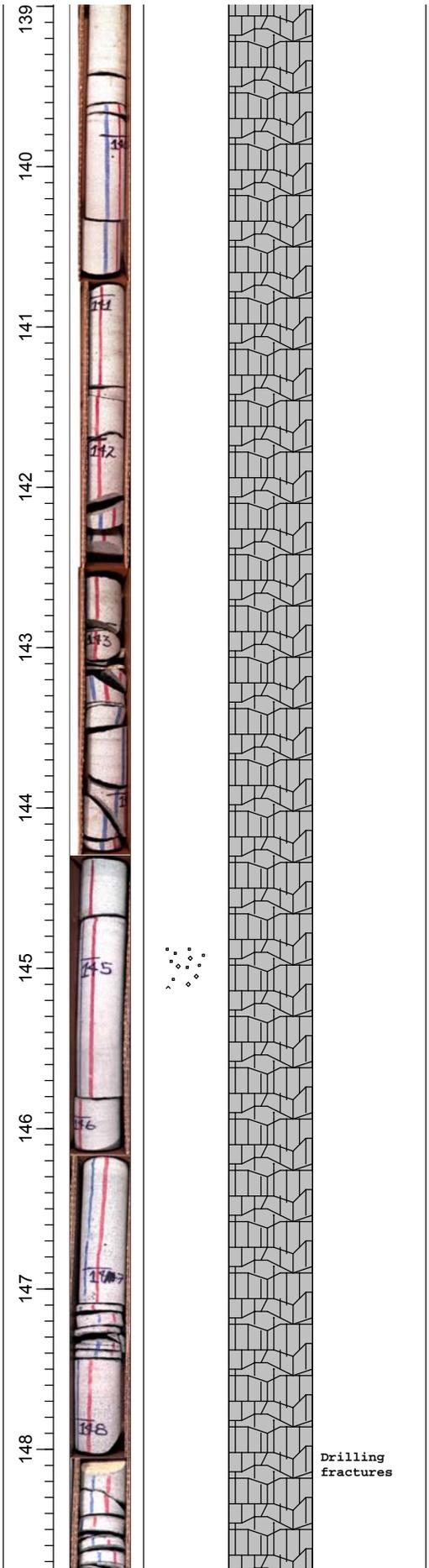


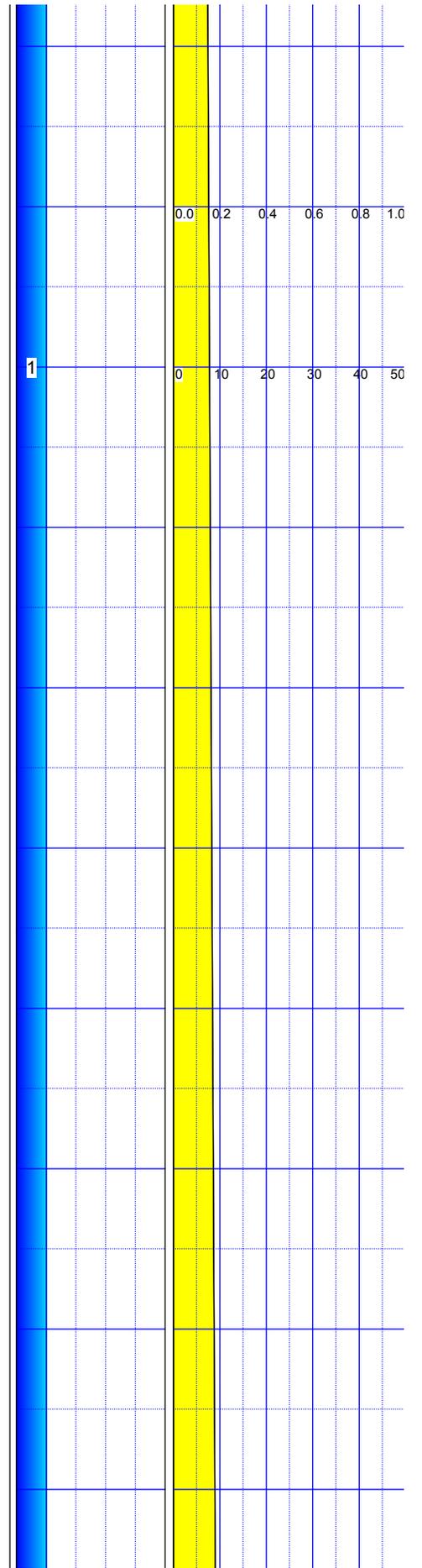
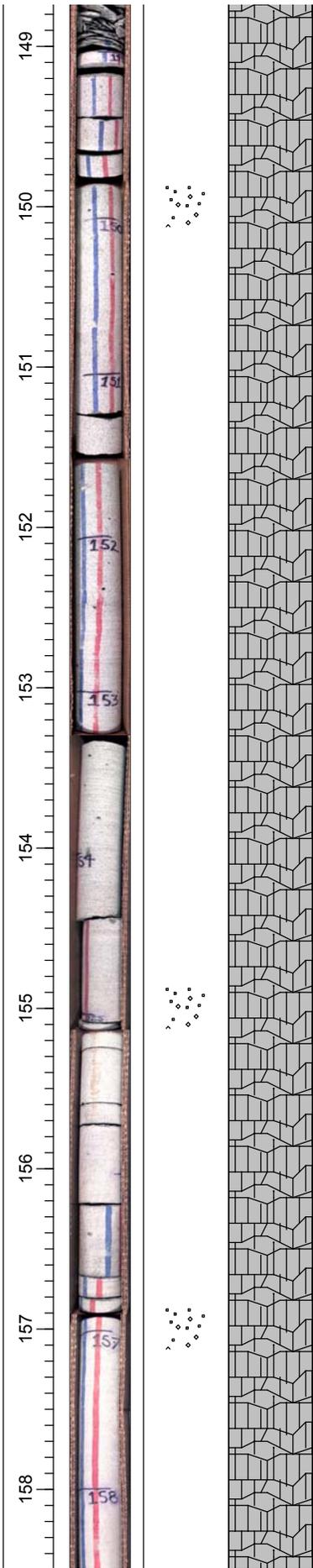


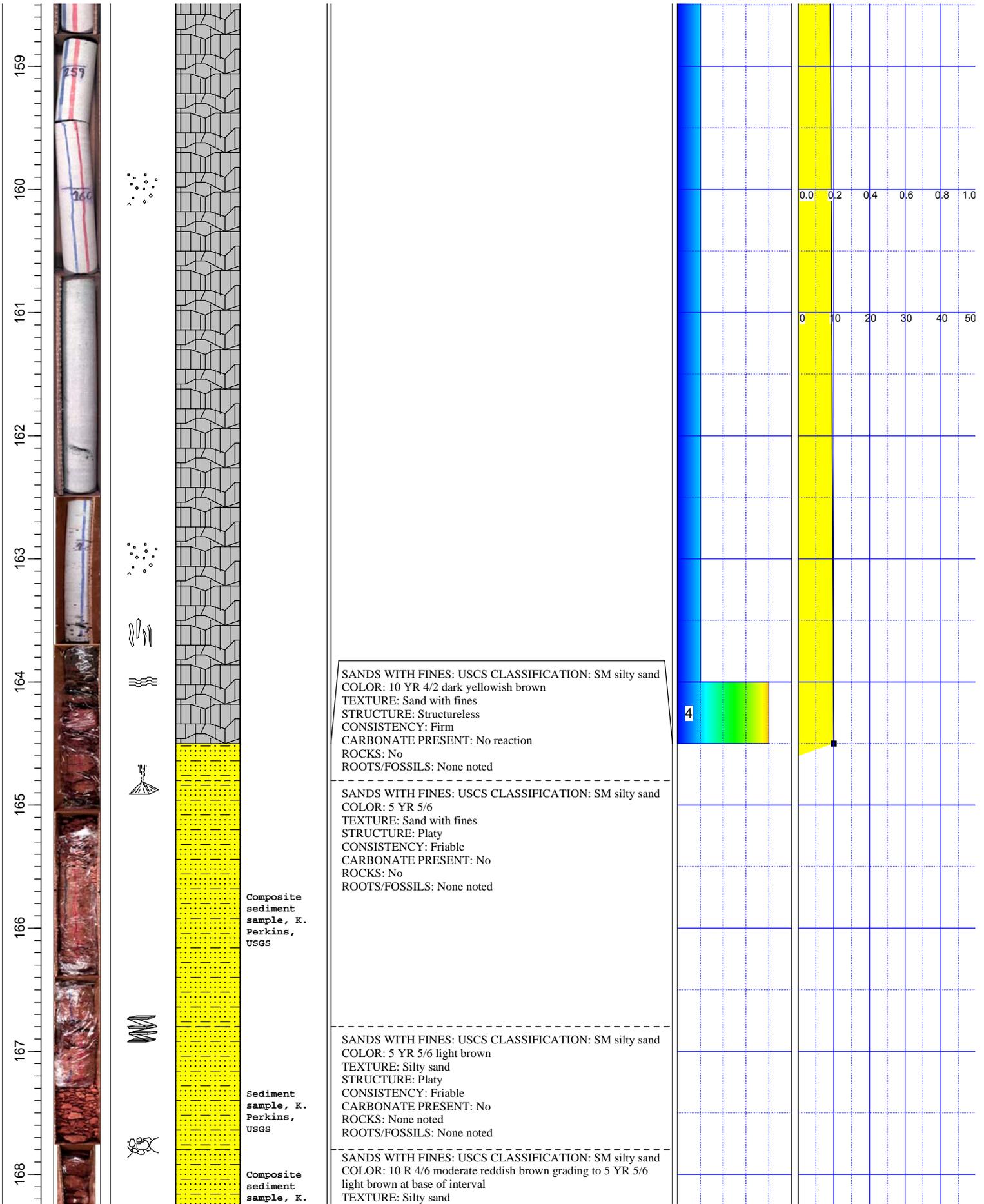






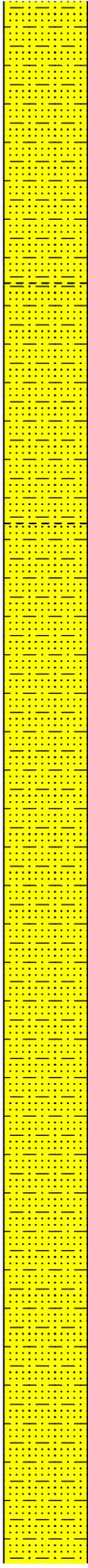








205X



Perkins, USGS

Composite sediment sample, K. Perkins, USGS

Composite sediment sample, K. Perkins, USGS

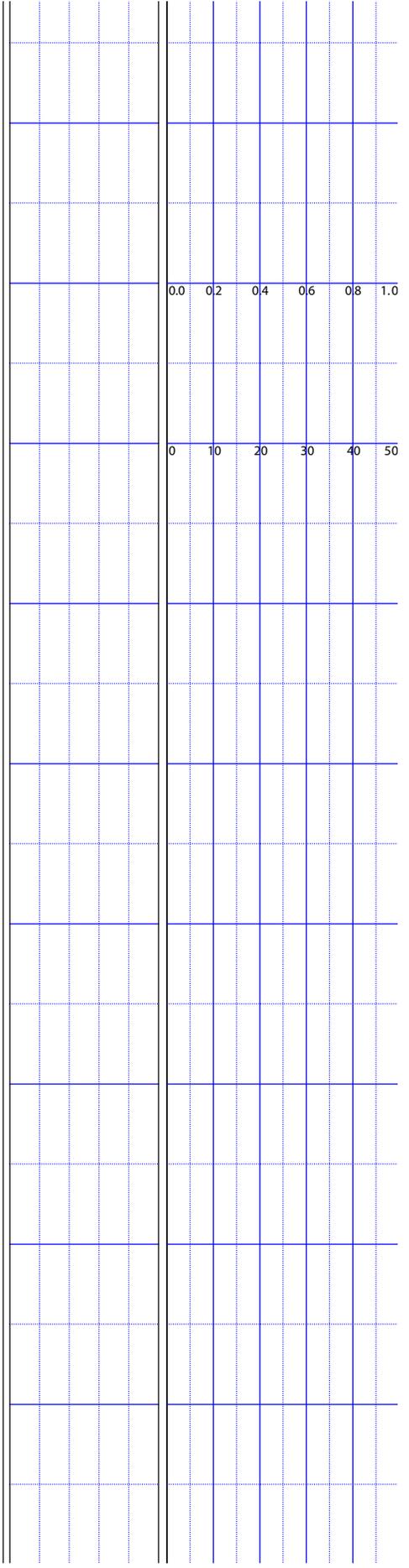
Two composite sediment samples, plus one-ft section K. Perkins, USGS

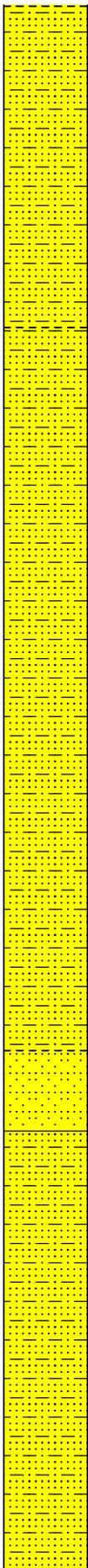
One foot section, K. Perkins, USGS

STRUCTURE: Blocky  
 CONSISTENCY: Firm  
 CARBONATE PRESENT: No  
 ROCKS: None noted  
 ROOTS/FOSSILS: None noted

SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand  
 COLOR: 10 R 3/4 dark reddish brown  
 TEXTURE: Fine to very fine sand with silt  
 STRUCTURE: Blocky  
 CONSISTENCY: Firm  
 CARBONATE PRESENT: None at top, slight reaction at base of interval  
 ROCKS: No  
 ROOTS/FOSSILS: No

SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand  
 COLOR: 10R 3/4 dark reddish brown at top of interval grades to 5 YR 6/4 at base of interval  
 TEXTURE: Fine sand with fines  
 STRUCTURE: Blocky at top, platy at base  
 CONSISTENCY: Firm at top, friable at base  
 CARBONATE PRESENT: Slight reaction  
 ROCKS: No  
 ROOTS/FOSSILS: No





One foot section, K. Perkins, USGS

Composite sediment sample at 183 ft, 2 unique sediment samples at 183.3 and 183.5 ft, K. Perkins, USGS



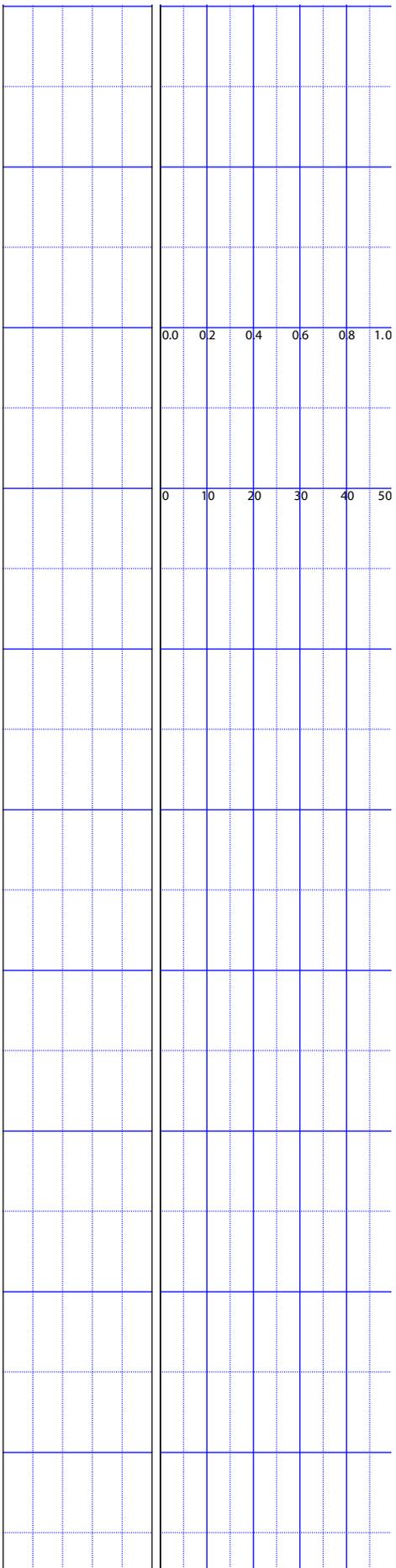
Sediment sample, K. Perkins, USGS

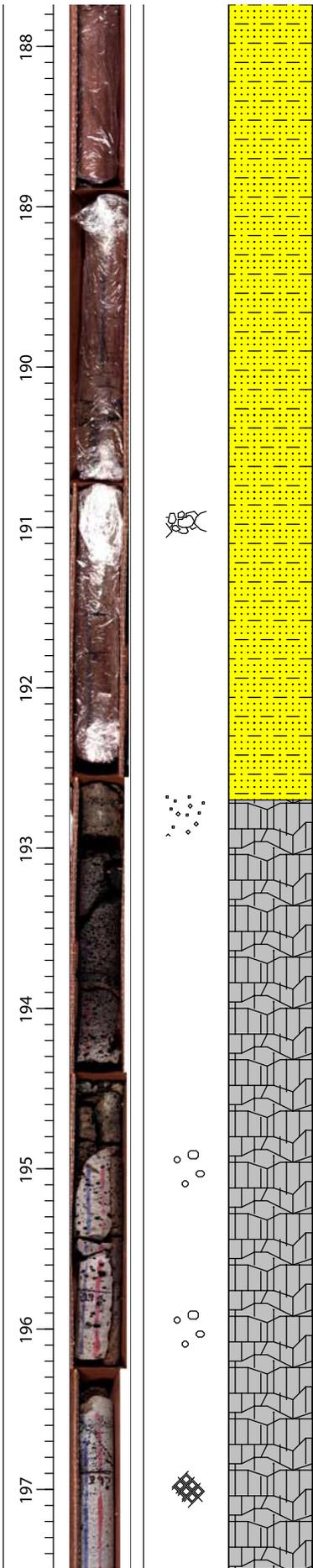
SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand  
 COLOR: 5 YR 6/4 light brown  
 TEXTURE: Fine sand with silt  
 STRUCTURE: Blocky to platy  
 CONSISTENCY: Firm  
 CARBONATE PRESENT: Slight reaction  
 ROCKS: No  
 ROOTS/FOSSILS: None noted

SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand  
 COLOR: 10 R 4/6 moderate reddish brown  
 TEXTURE: Fine sand with silt  
 STRUCTURE: Platy  
 CONSISTENCY: Firm  
 CARBONATE PRESENT: Strong reaction  
 ROCKS: No  
 ROOTS/FOSSILS: None noted

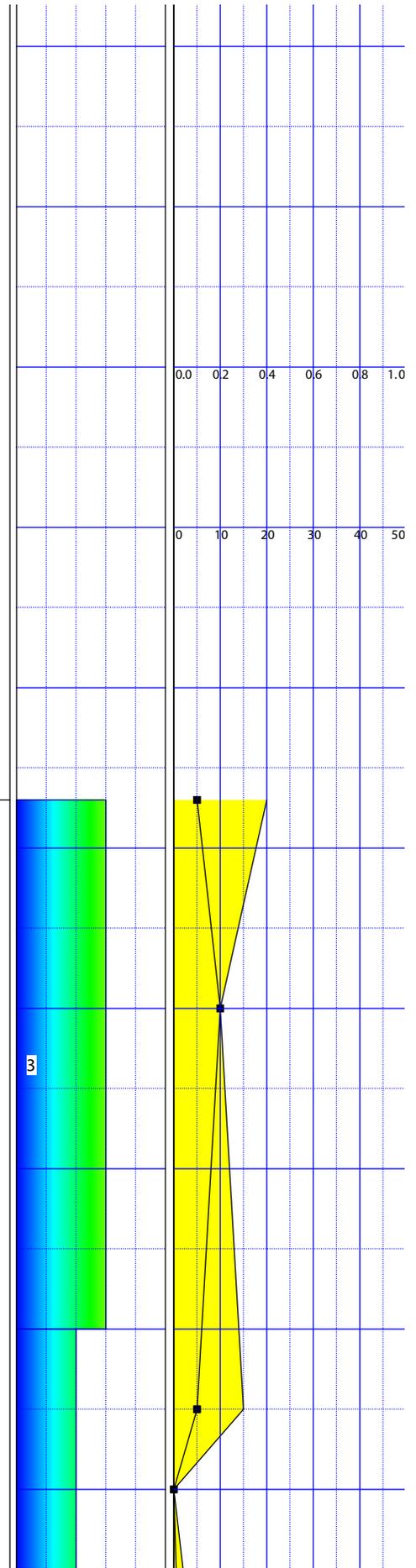
SANDS - CLEAN: USCS CLASSIFICATION: Clean sand, SW  
 COLOR: 5 YR 5/2 pale brown  
 TEXTURE: Poorly graded, poorly sorted medium to coarse quartz lithic sand, lithics include basalt, andesite, limestone, chert, and quartzite  
 STRUCTURE: Structureless  
 CONSISTENCY: Friable  
 CARBONATE PRESENT: No  
 ROCKS: Yes, pebbles up to 1.5 cm  
 ROOTS/FOSSILS: No

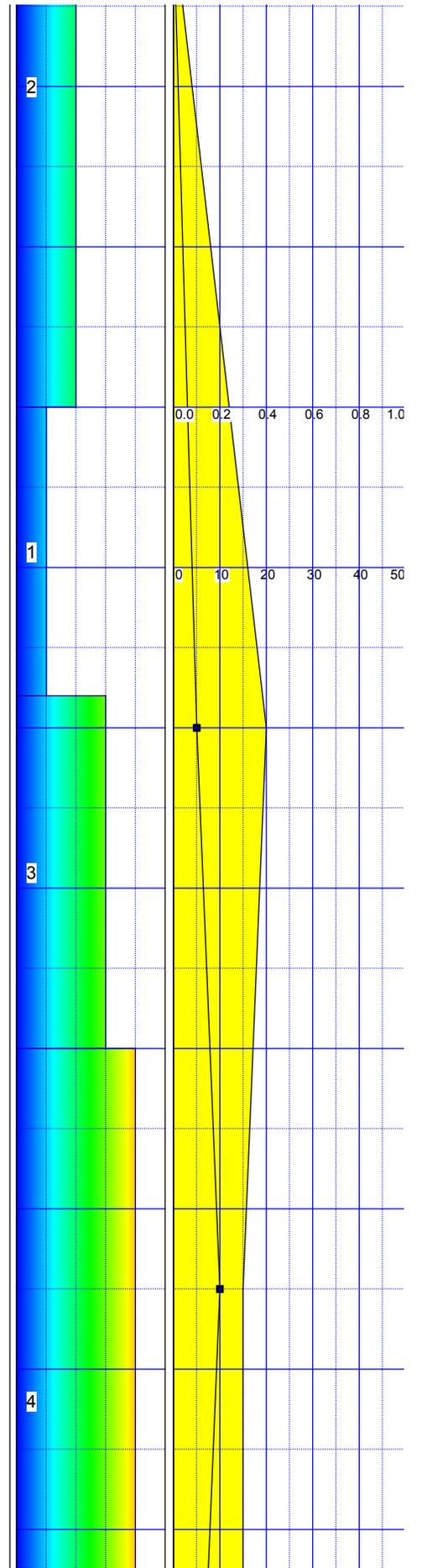
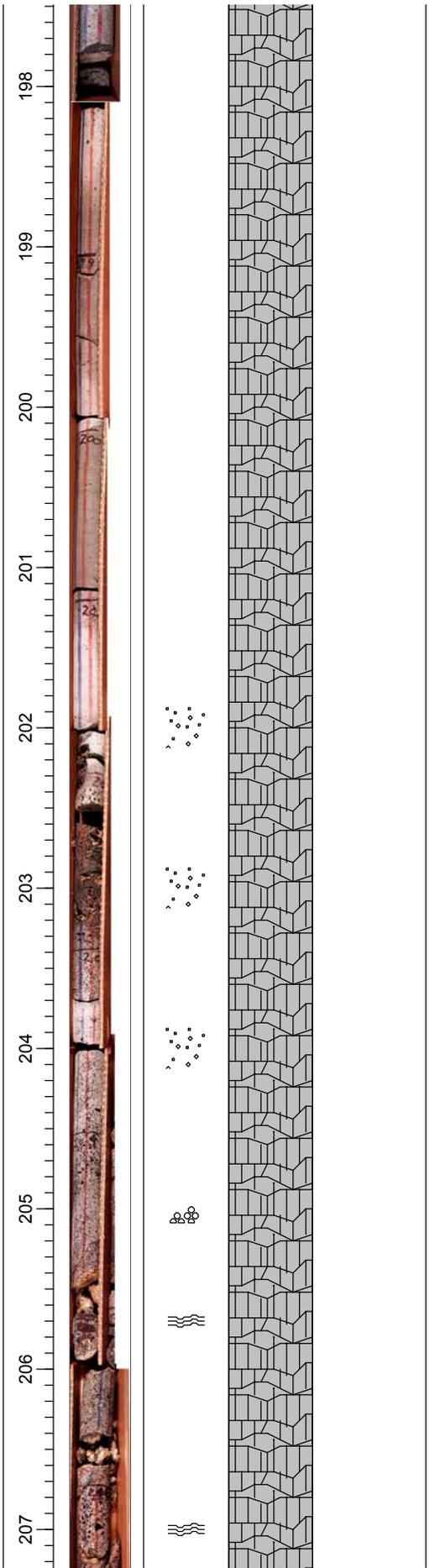
SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand  
 COLOR: 5 YR 4/4 moderate brown at top of interval, grades to 10 YR 4/2 dark yellowish brown at base of interval  
 TEXTURE: Well sorted lithic sand, grains are rounded to subrounded  
 STRUCTURE: Blocky  
 CONSISTENCY: Firm  
 CARBONATE PRESENT: Yes, weak reactivity at top of interval, increasing to strongly reactive near base  
 ROCKS: No  
 ROOTS/FOSSILS: No

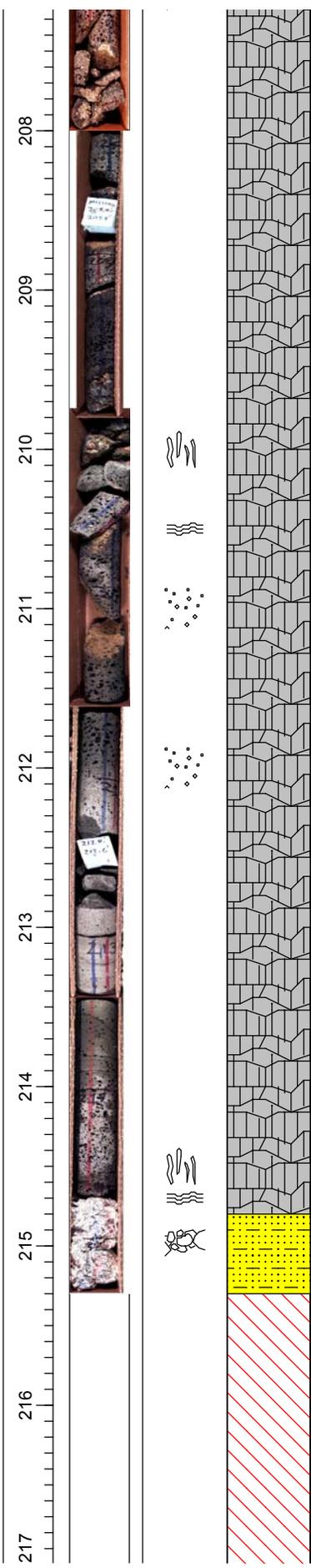




**BASALT:** COLOR: N4 medium dark grey  
**TEXTURE:** Aphanitic basalt, vesicular from top to 197 ft, diktytaxitic from 197 to 198 ft, massive to 202 ft, vesicular from 202 to 214.7, rubble at 204.8 and 208 ft, flow structure and spatter at base  
**COMPOSITION:** 15 % anhedral to subhedral, 0.5 to 1mm, green olivine phenocrysts in a dark grey matrix  
**XENOLITHS/AUTOLITHS:** None noted  
**ALTERATION:** Reddish oxidation inside vesicles at base of interval, white to buff non-calcareous, dull, massive mineral on fracture surfaces

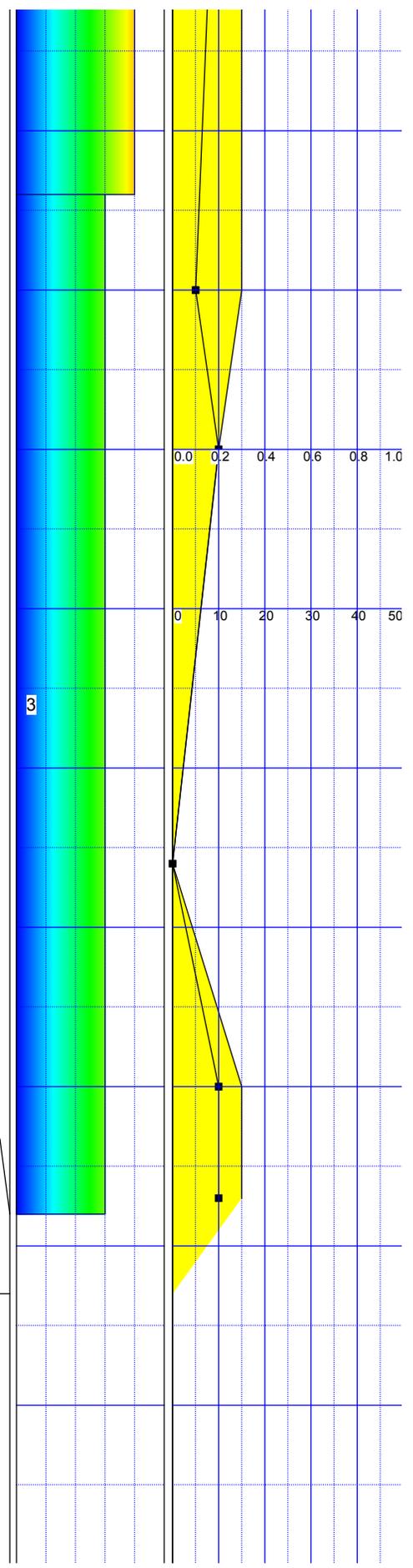


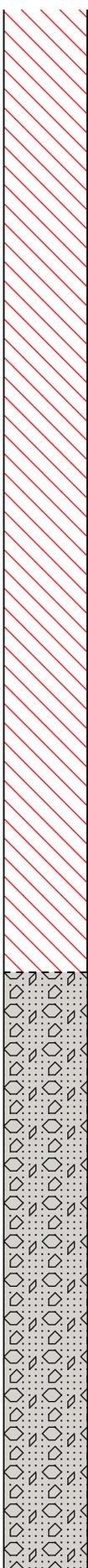




SANDS WITH FINES: USCS CLASSIFICATION: ML silt  
 COLOR: 5YR 6/4 light brown  
 TEXTURE: Silt with quartz and lithic grains  
 STRUCTURE: Blocky  
 CONSISTENCY: Friable  
 CARBONATE PRESENT: No  
 ROCKS: A few, 2-4 cm basalt clasts at top of interval  
 ROOTS/FOSSILS: None noted

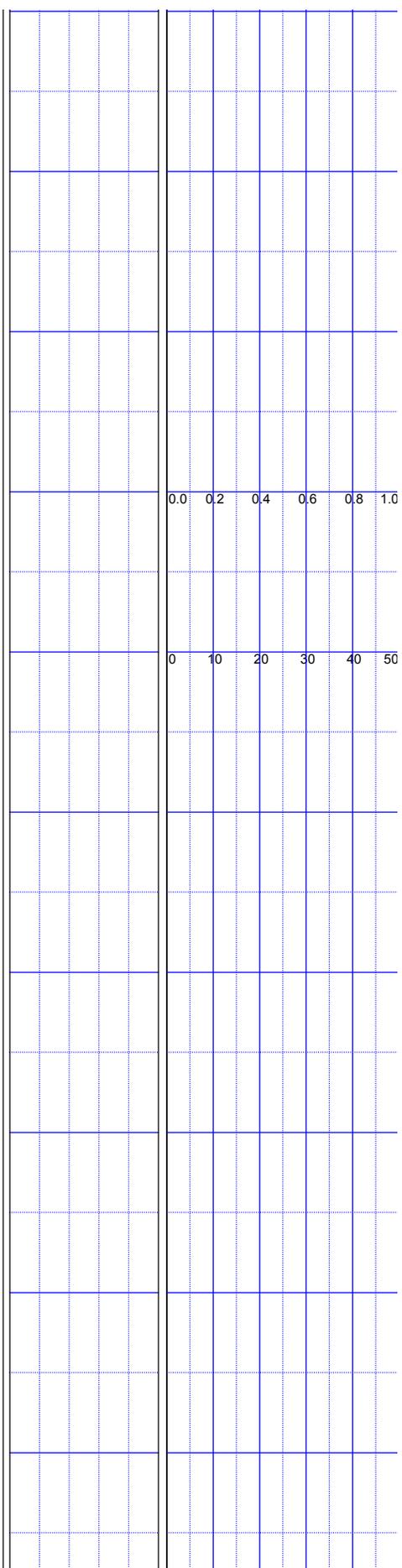
MISSING INTERVAL: .

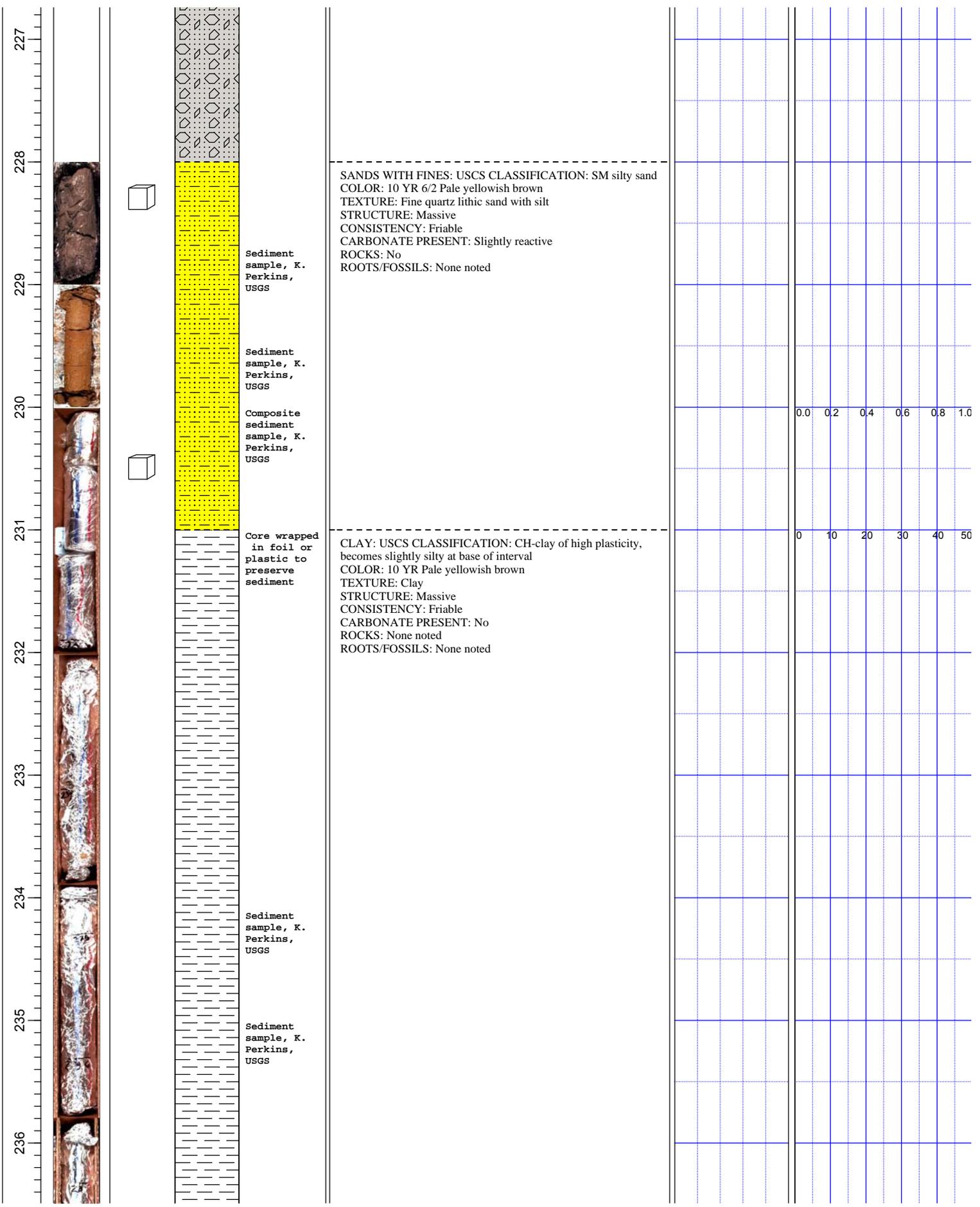


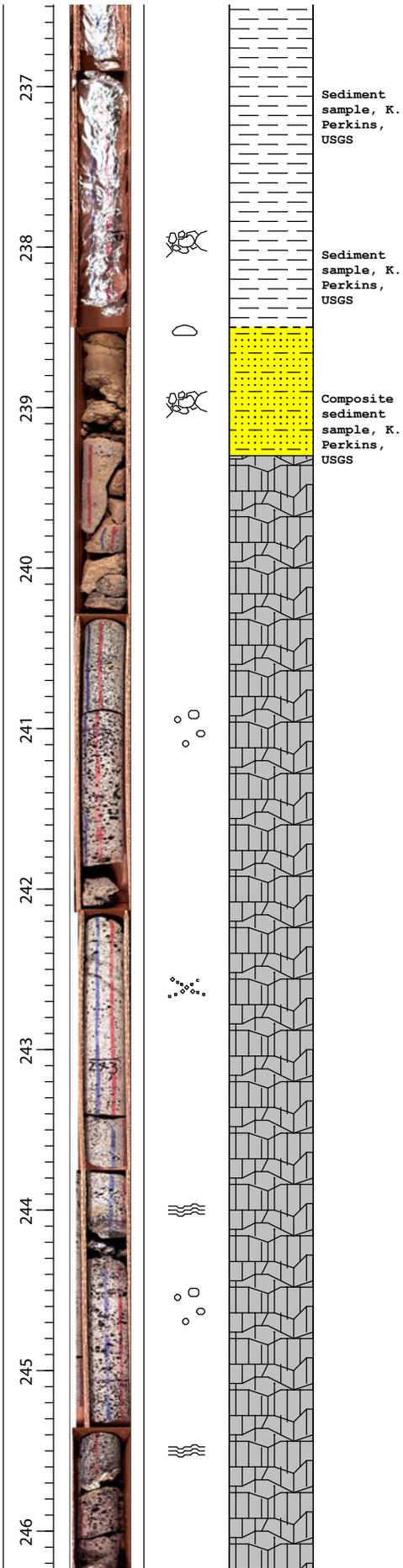


Description from small sample, most of interval not recovered

GRAVELS WITH FINES: USCS CLASSIFICATION: GM silty gravel  
COLOR: 10 YR 6/2 pale yellowish brown  
TEXTURE: Very poorly sorted gravel with medium sand, clasts are subrounded to subangular, range in size from medium sand to medium pebbles, interval only partially recovered. Clasts include basalt and quartzite  
STRUCTURE: Structure disrupted by drilling fluid, unknown  
CONSISTENCY: Firm  
CARBONATE PRESENT: None noted  
ROCKS: Yes, see above  
ROOTS/FOSSILS: None noted

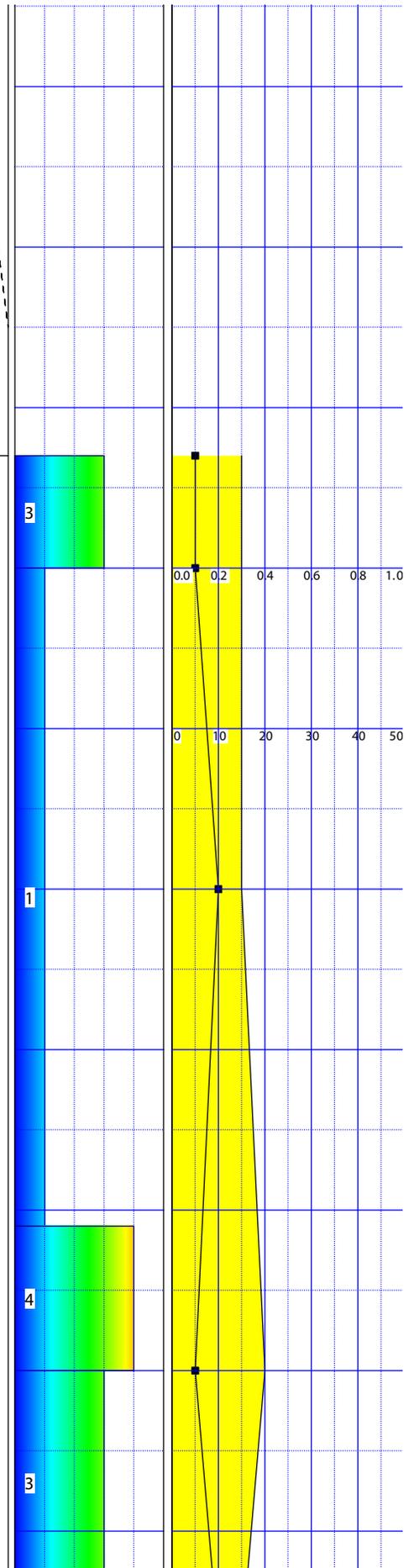


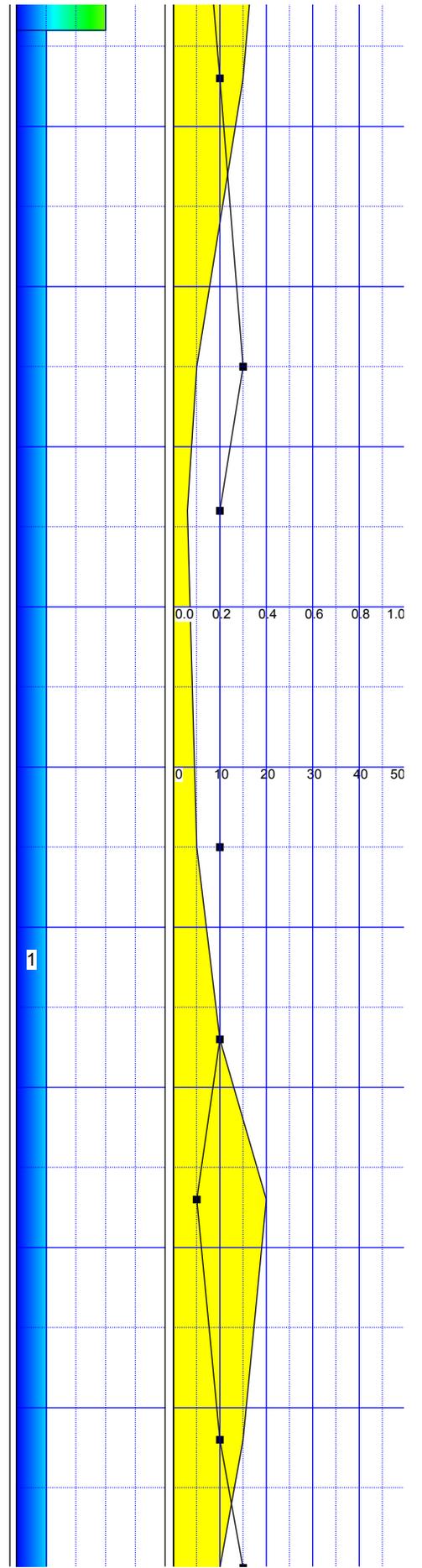
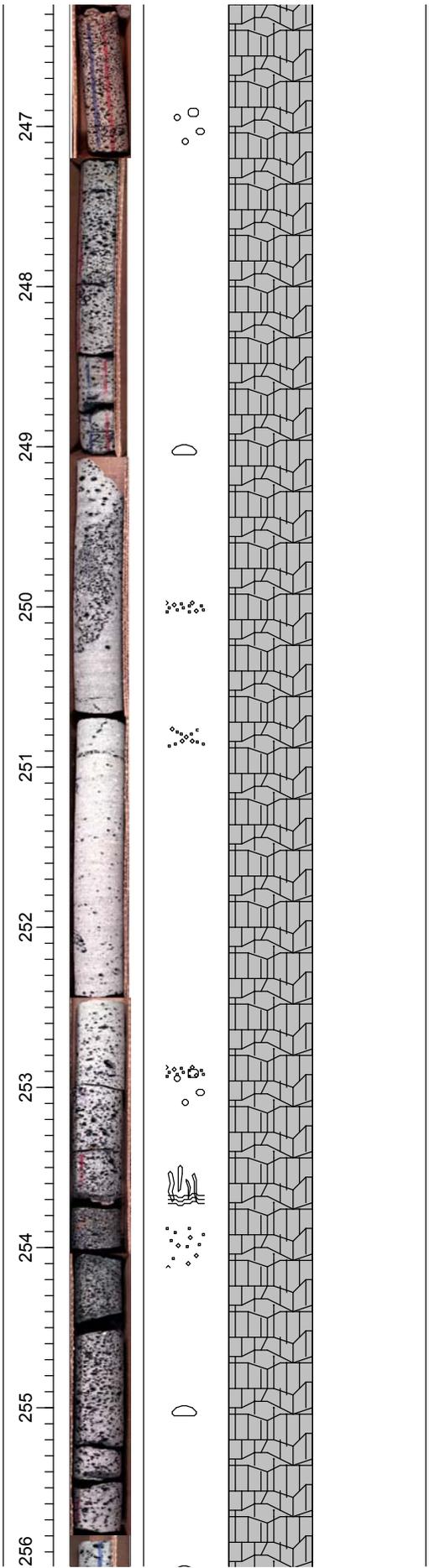


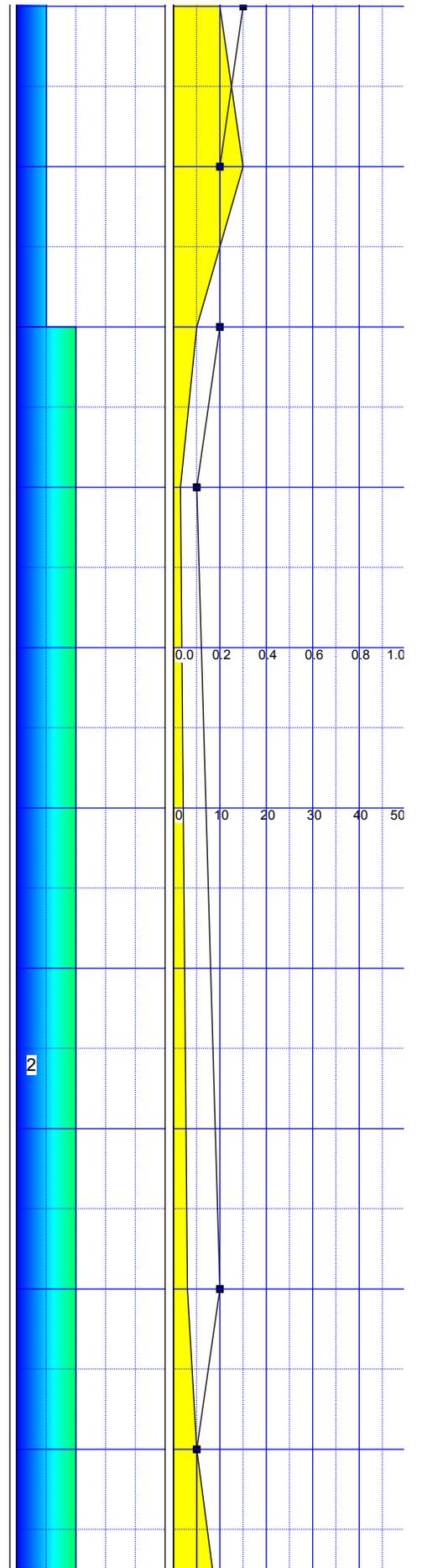
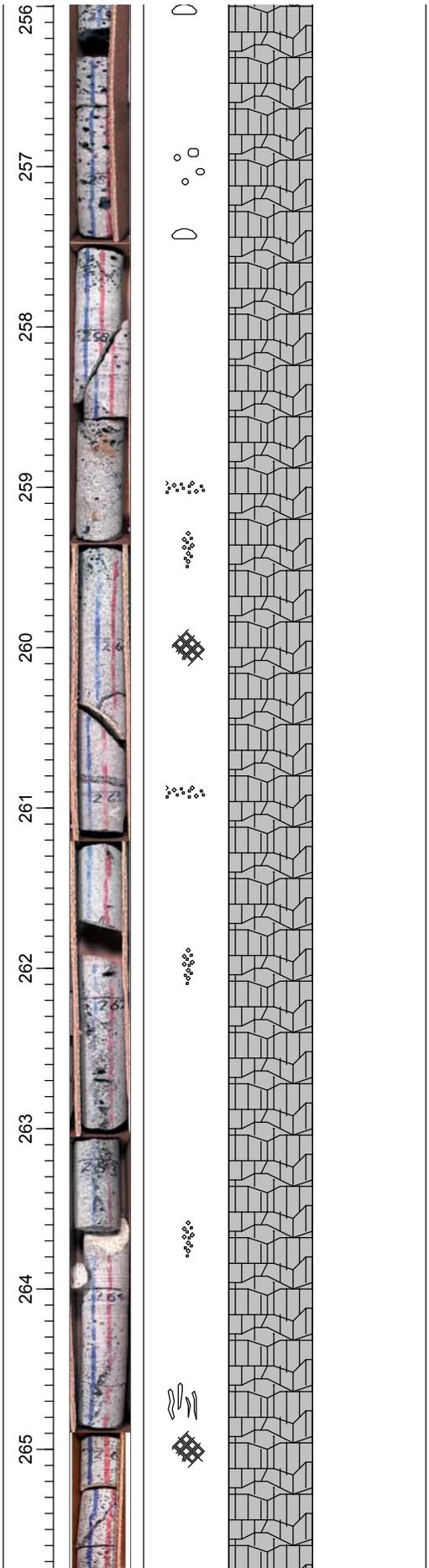


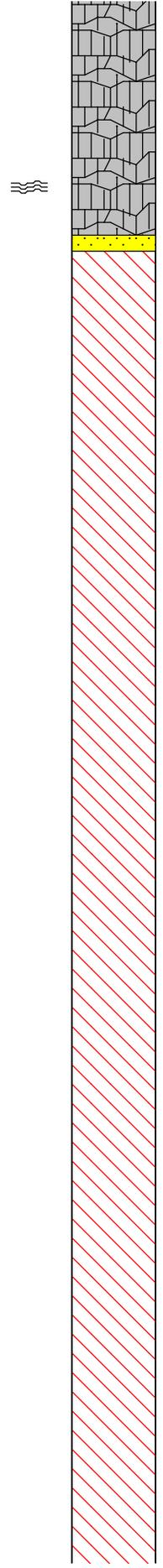
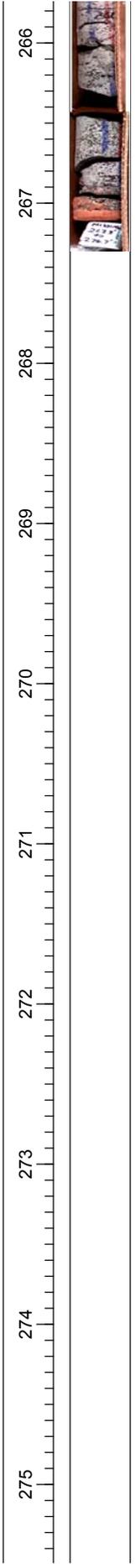
SANDS WITH FINES: USCS CLASSIFICATION: SC -clayey sand  
 COLOR: 10 YR 6/2 pale yellowish brown  
 TEXTURE: Moderately sorted very fine to fine quartz lithic sand with silt and sparse granules and fine pebbles, quartz grains are rounded, lithic grains are subangular to angular  
 STRUCTURE: Blocky  
 CONSISTENCY: Firm  
 CARBONATE PRESENT: No  
 ROCKS: A few granules and pebbles of subangular basalt  
 ROOTS/FOSSILS: None noted

BASALT: COLOR: N4 Medium dark grey  
 TEXTURE: Phaneritic, subophitic, porphyritic, basalt. Vesicular from top to 250 ft, massive with a few large (1 cm) vesicles to 252.6 ft, vesicular with vesicles increasing in size and decreasing in number to 258.7 ft, diktytaxitic with vesicle planes and cylinders to 265 ft, then vesicular to base of interval. Megavesicle at 242, 244, and 256.1 ft, flow mold at 254 ft, The massive section has larger phenocrysts of all mineral phases, and some glomerocrysts of plagioclase phenocrysts, and of olivine.  
 COMPOSITION: 65% white, euhedral, 0.5-1.0 mm plagioclase in lathwork framework, with 25% 1-1.5 euhedral green olivine phenocrysts and 1.5% black euhedral phenocrysts  
 XENOLITHS/AUTOLITHS: None noted  
 ALTERATION: White to tan massive non-calcareous mineral on flow mold structure at 254 ft, and at 242 and 244 ft



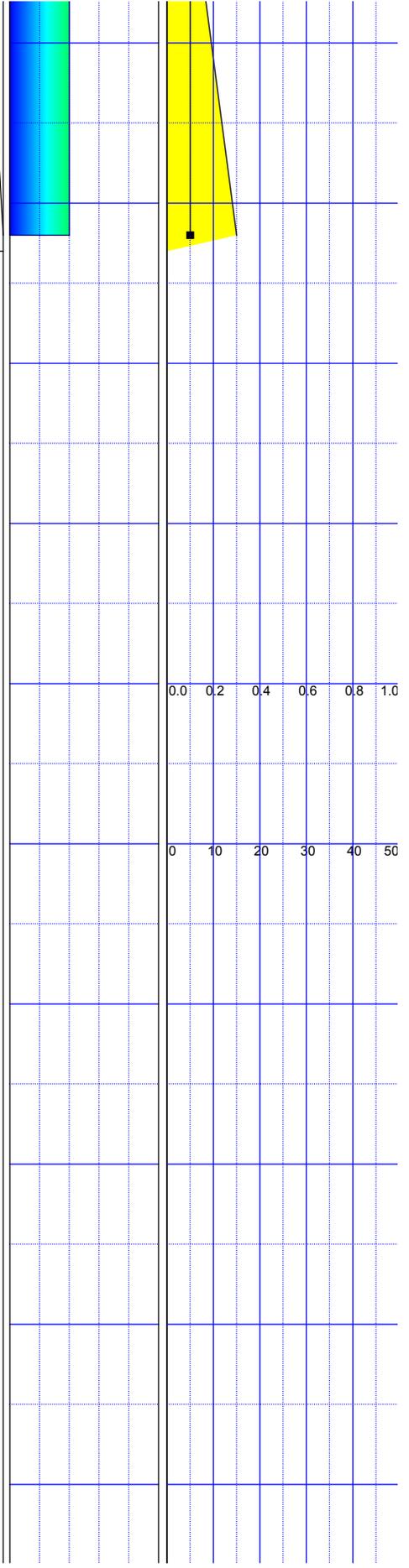


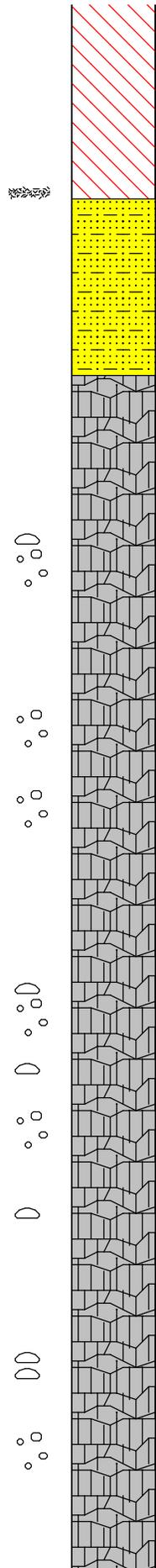
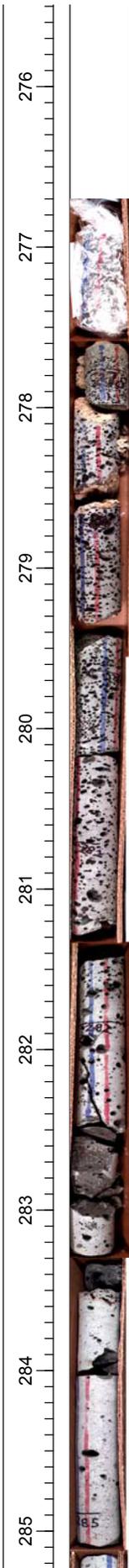




SANDS - CLEAN: USCS CLASSIFICATION: SM silty sand  
COLOR: 5 YR 5/6 light brown  
TEXTURE: Well sorted quartz lithic silty sand. Quartz grains are rounded, black lithic grains include basalt and obsidian, and are subrounded to angular  
STRUCTURE: Massive  
CONSISTENCY: Firm  
CARBONATE PRESENT: No  
ROCKS: 5-7 mm angular basalt pebbles  
ROOTS/FOSSILS: None noted

MISSING INTERVAL

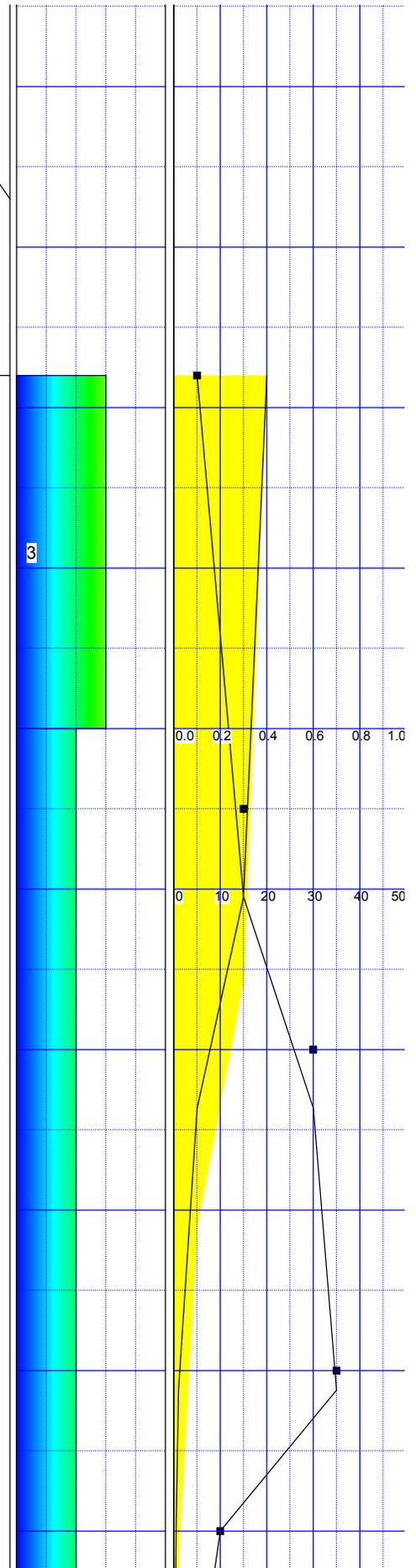


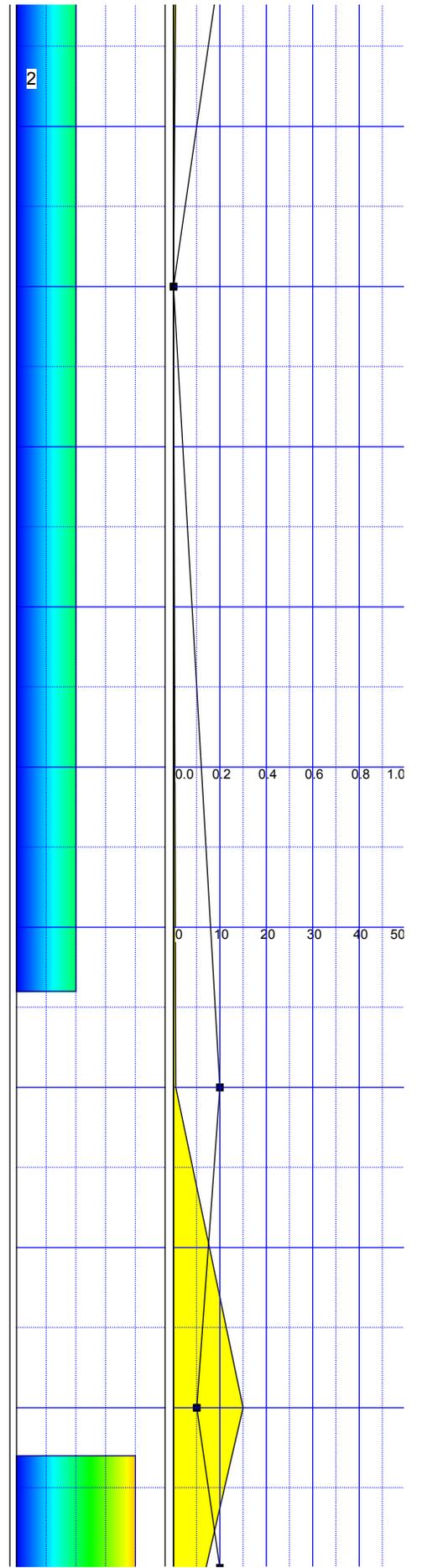
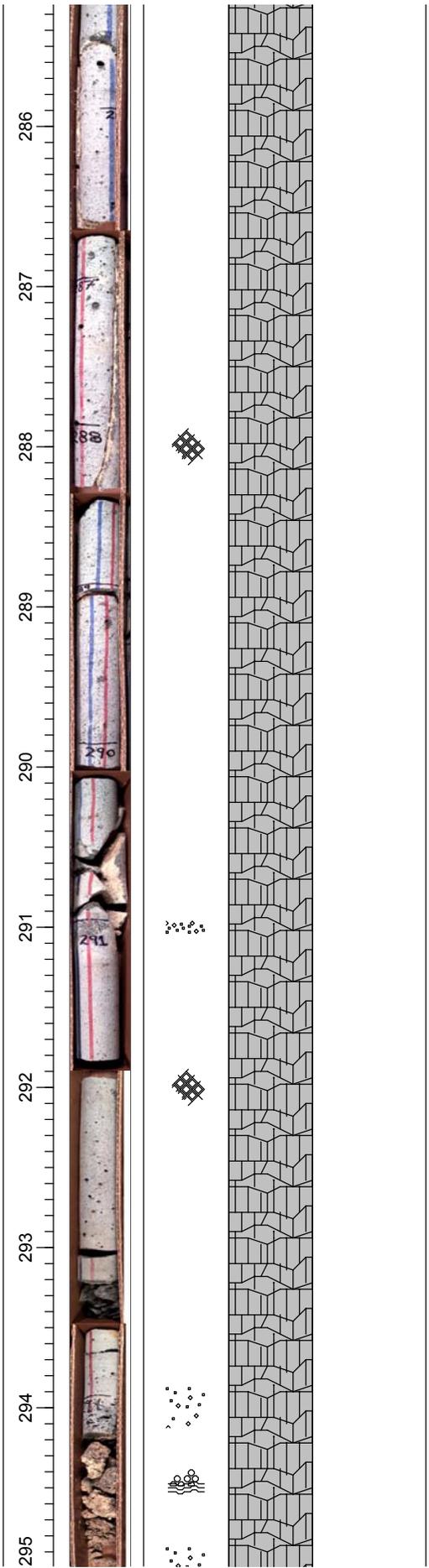


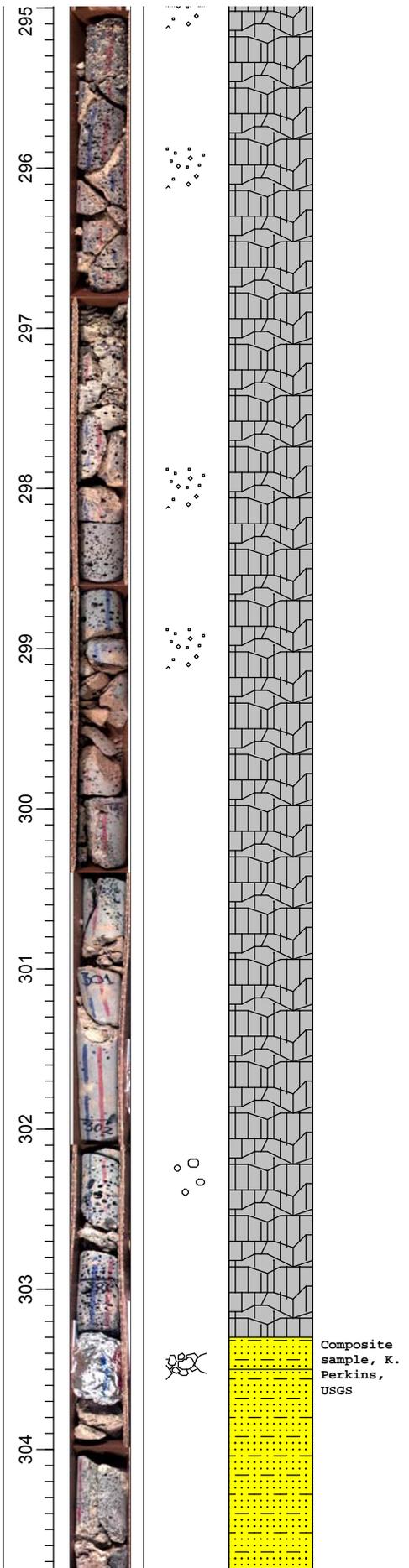
Sediment sample, K. Perkins, USGS

SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand  
 COLOR: 5 YR 3/2 Greyish brown  
 TEXTURE: Fine lithic quartz sand with silt, Pink, tan, black, and white lithics are subrounded to angular, quartz grains are rounded and in general smaller than the lithic grains  
 STRUCTURE: Granular  
 CONSISTENCY: Loose  
 CARBONATE PRESENT: yes  
 ROCKS: Large (10 cm) angular clasts of basalt  
 ROOTS/FOSSILS: No

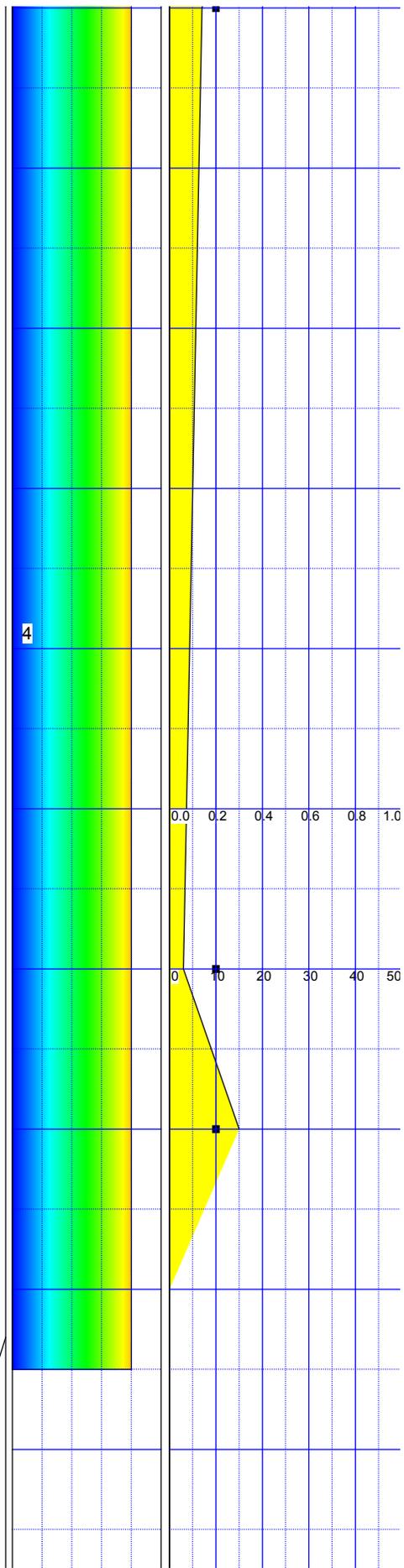
BASALT: COLOR: N4 medium dark grey  
 TEXTURE: Aphanitic basalt, vesicular from top of interval, vesicles increase in size and decrease in number to 286.5 ft, basalt is diktytaxitic with a few large vesicles to 289 ft, then is diktytaxitic to 294 ft, and then increasingly vesicular to the base of the interval. Flow/mold structures found at base.  
 COMPOSITION: Randomly oriented subhedral to euhedral plagioclase laths surround rare euhedral to subhedral green olivine microphenocrysts and rare 1-2 mm euhedral white plagioclase phenocrysts in a dark grey groundmass  
 XENOLITHS/AUTOLITHS: Autolith at 291 ft  
 ALTERATION: White to buff massive non-calcareous mineral inside vesicles and on fracture surfaces

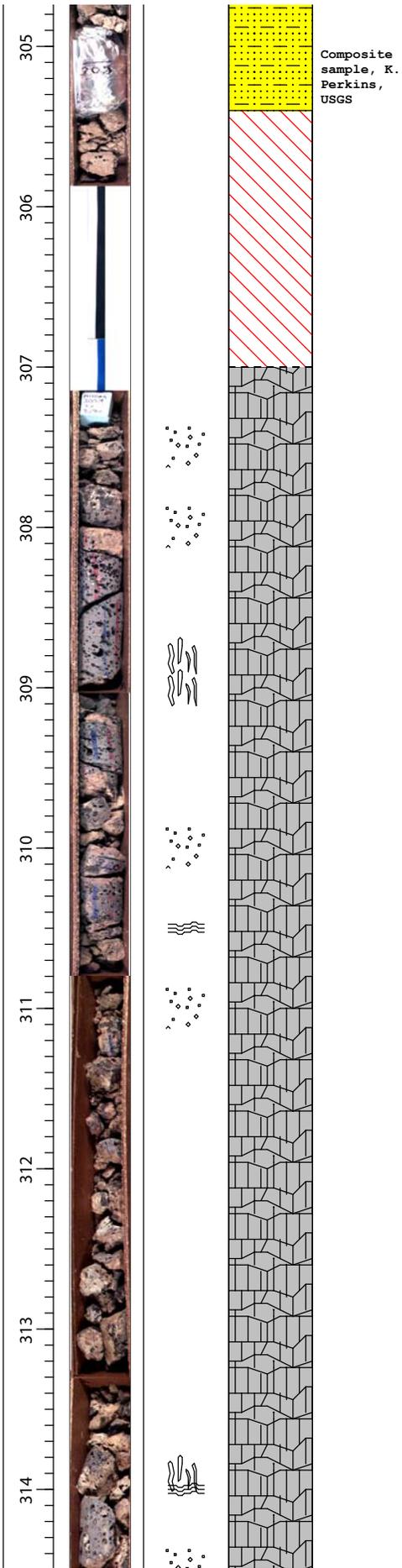






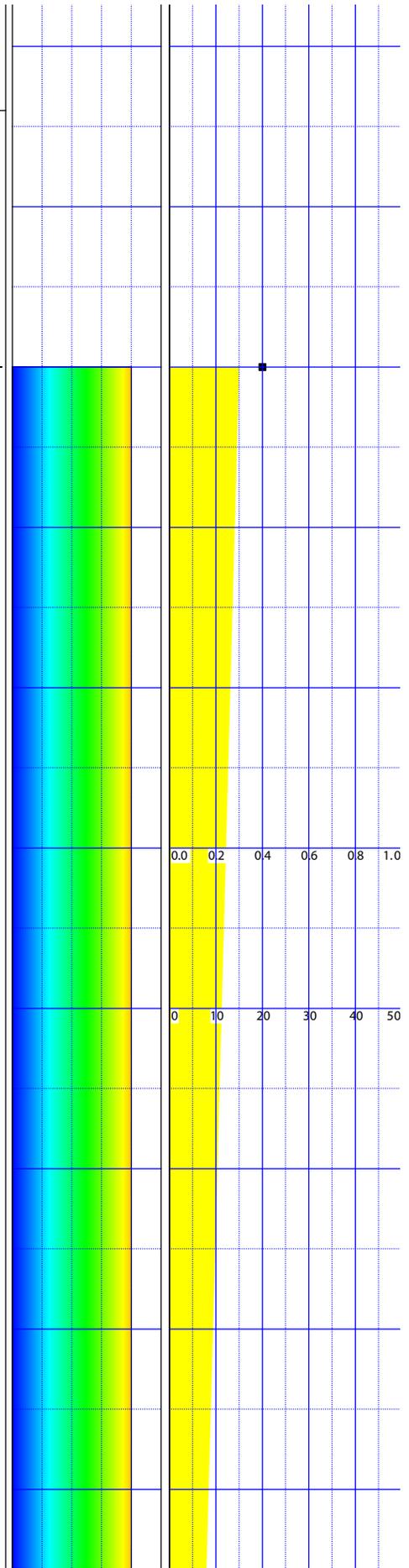
SANDS WITH FINES: USCS CLASSIFICATION: SM silty sand  
COLOR: 10 YR 7/4 Greyish orange  
TEXTURE: Fine to very fine-grained silty sand  
STRUCTURE: Massive to blocky  
CONSISTENCY: Firm  
CARBONATE PRESENT: No  
ROCKS: Cobbles and pebbles of angular basalt  
ROOTS/FOSSILS: None noted

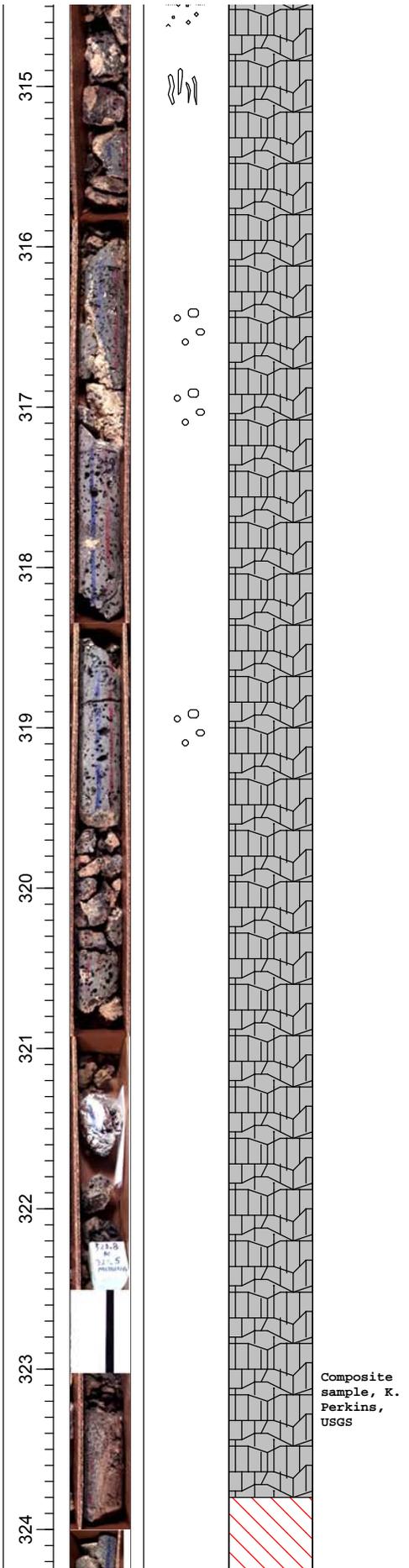




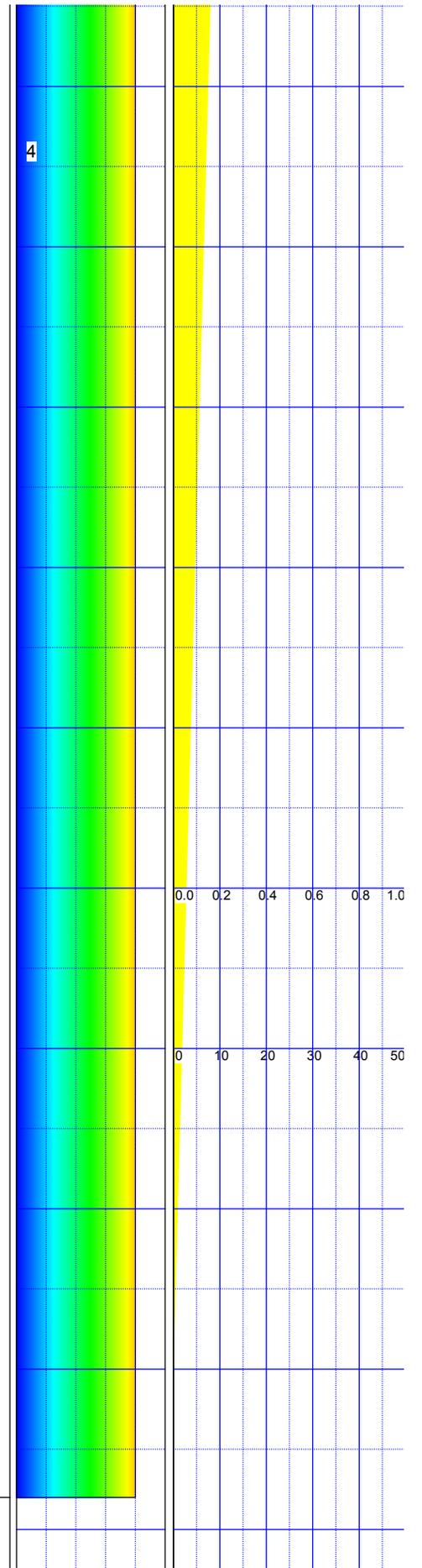
MISSING INTERVAL: Core above and below very broken, depths from 324 ft and below may be off as much as one foot

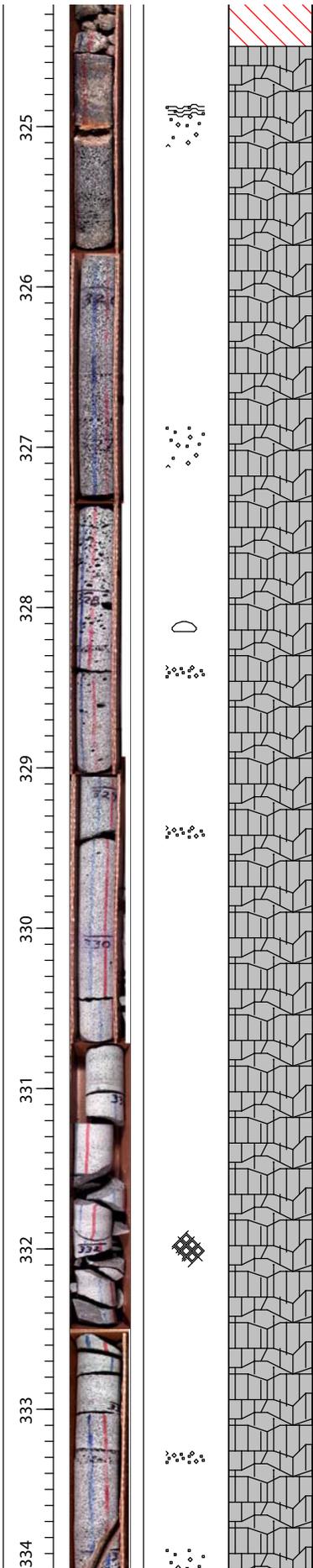
BASALT: COLOR: N3 Dark grey  
 TEXTURE: Aphanitic, vesicular  
 COMPOSITION: Approximately equal amounts of tiny reddish subhedral olivine microphenocrysts and white plagioclase phenocrysts in a glassy dark grey matrix, with a few black microphenocrysts  
 XENOLITHS/AUTOLITHS: None noted  
 ALTERATION: Olivine exteriors altered to reddish iddingsite. Copious soil in fractures reacts slightly to acid at the top of the interval, increasing in strength with depth. This interval is a rubble zone, with many sub-horizontal and vertical fractures.



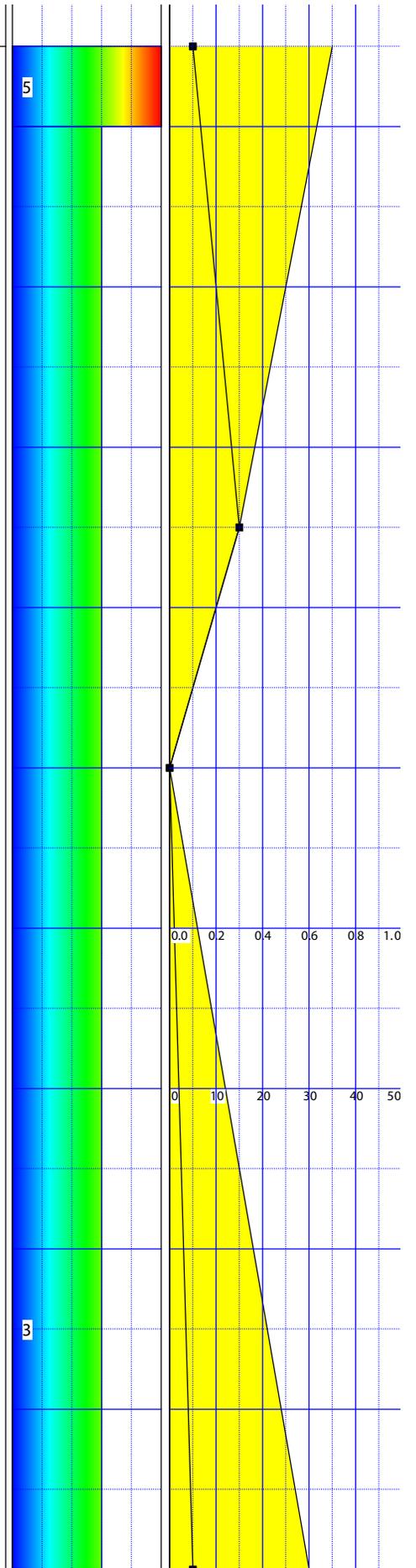


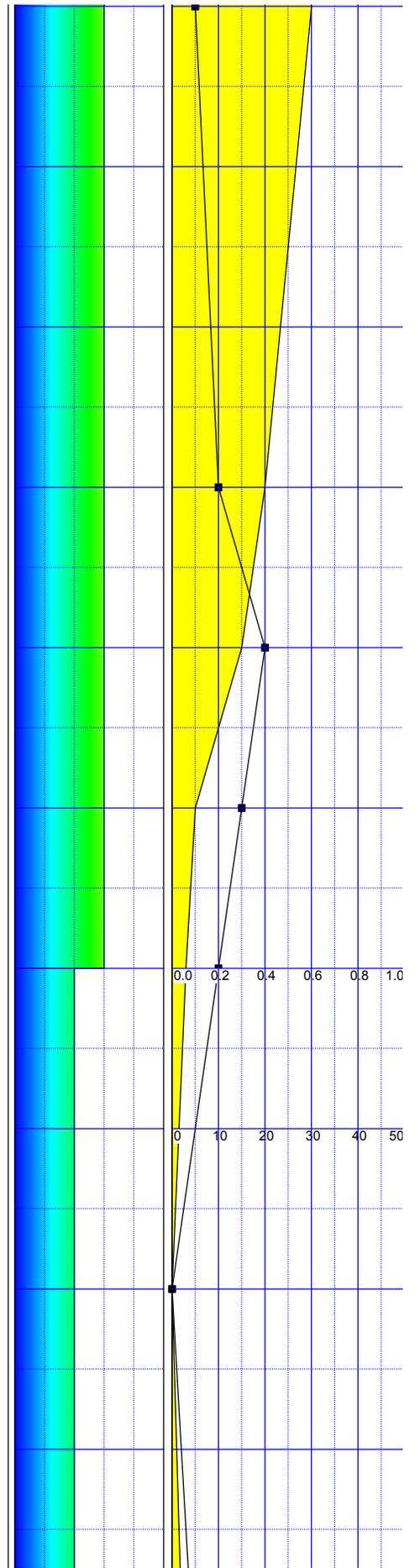
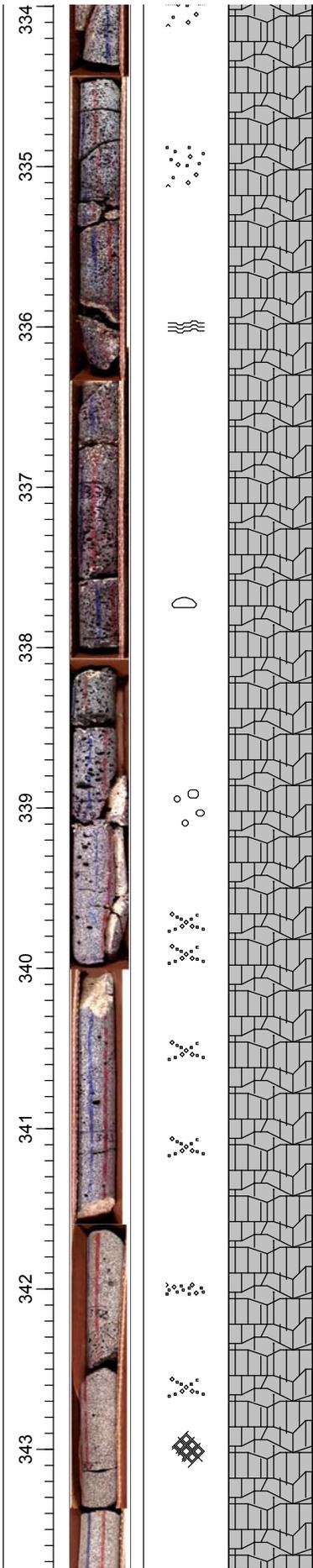
MISSING INTERVAL: Core above and below this interval is fragmented, and depth measurements may be inaccurate in these intervals.

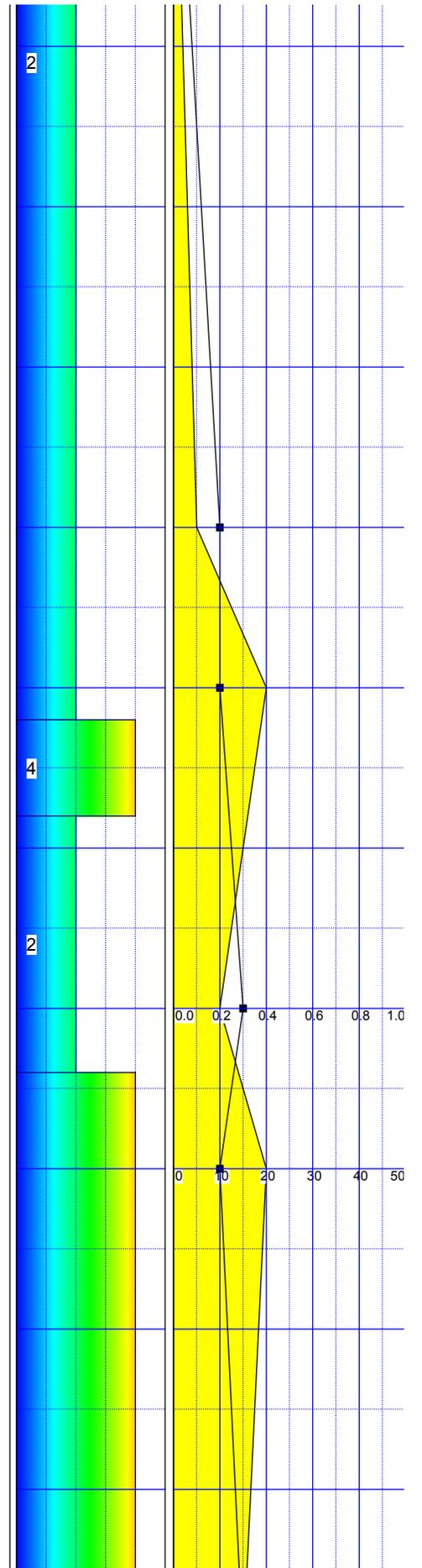
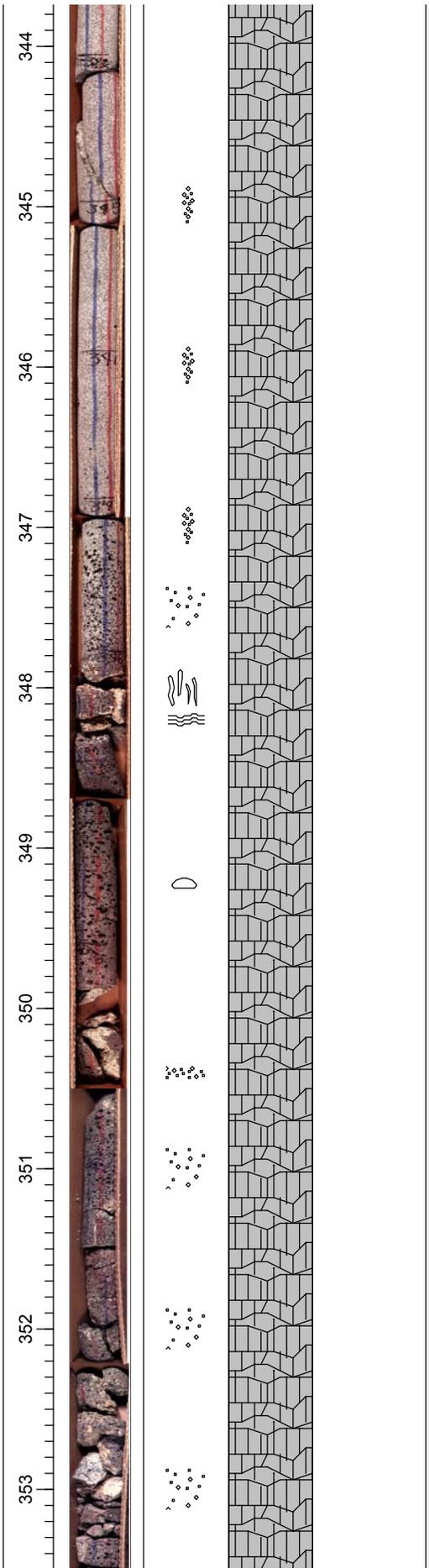


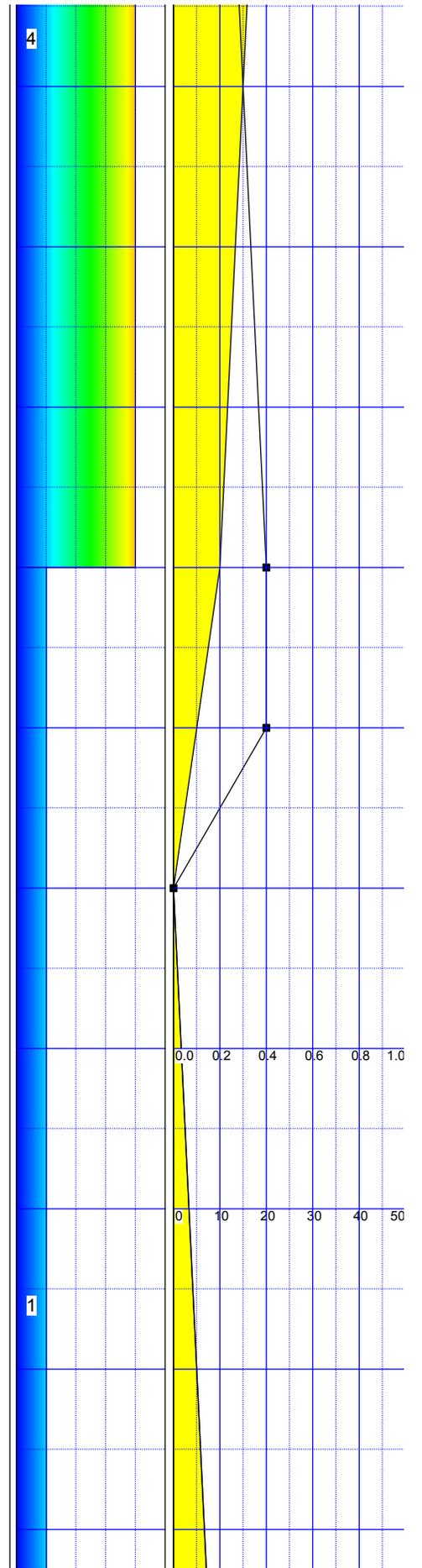
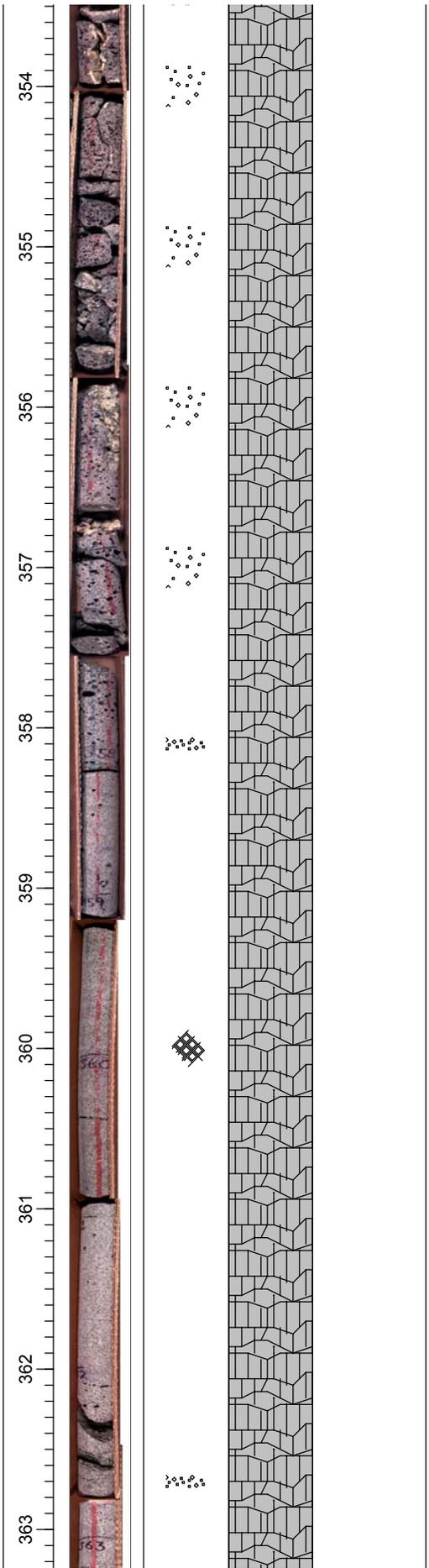


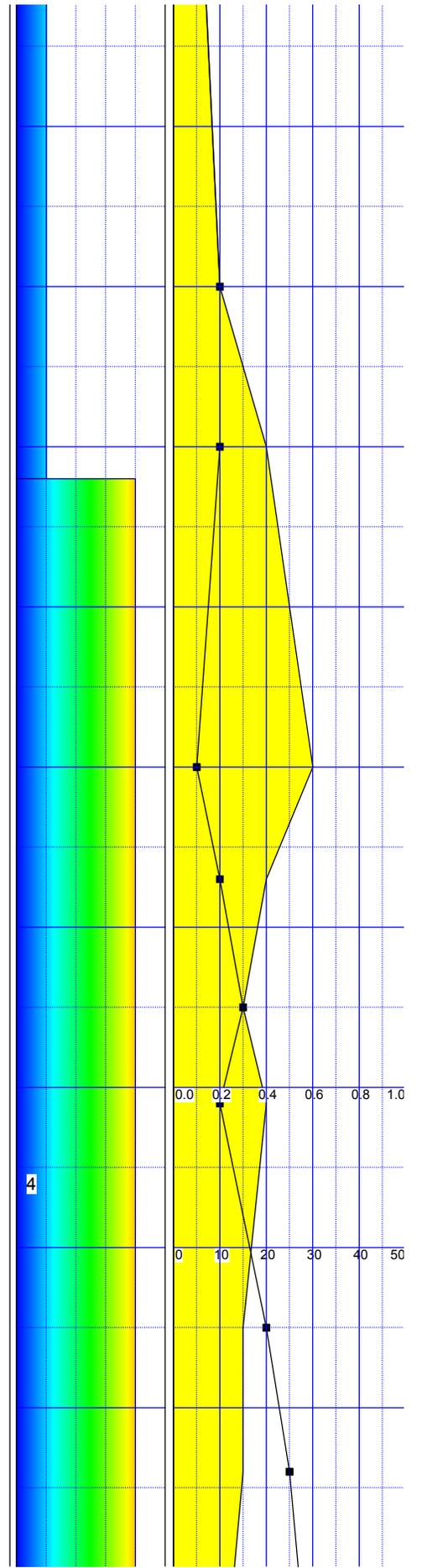
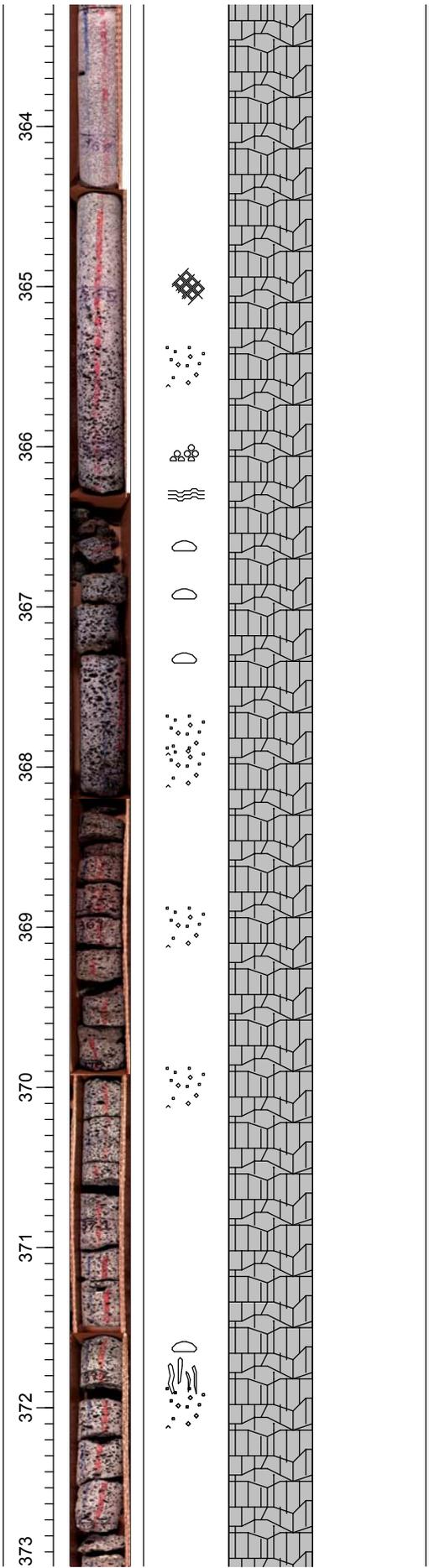
**BASALT: COLOR:** N5 medium grey  
**TEXTURE:** Barely phaneritic, subophitic basalt., vesicular from top of interval to 329 ft, diktytaxitic from 329 to 334 ft, vesicular from 334 to 341 ft, diktytaxitic from 341 to 347 ft, vesicular from 347 to 359 ft, diktytaxitic from 359 to 365 ft, vesicular from 365 to 376 ft, diktytaxitic from 376 to 379.2 ft, vesicular from 379.2 to 393 ft, diktytaxitic from 393 to 405 ft, massive from 405 to 406.5 ft, diktytaxitic from 406.5 to 425.5 ft, vesicular from 425.5 ft to base of interval. Flow structures present at 348.2, 350.3, 368.2 380.5 ft, and at base of interval  
**COMPOSITION:** 60% intergrown white lath-shaped, plagioclase microphenocrysts, with 35 % anhedral green olivine microphenocrysts in the interstices of the plagioclase framework, 1-3% acicular black mineral that crosses the plagioclase framework,  
**XENOLITHS/AUTOLITHS:** Xenolith at 467.4 ft  
**ALTERATION:** Reddish oxidation surfaces of flow structures, greenish alteration mineral on fracture surfaces and inside vesicles near 366 ft

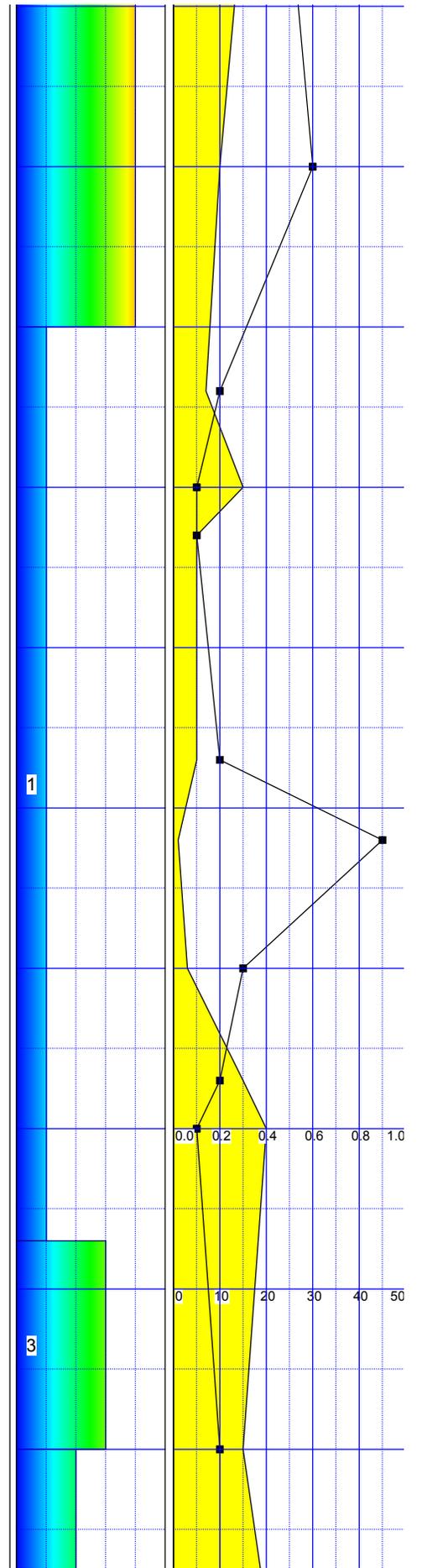
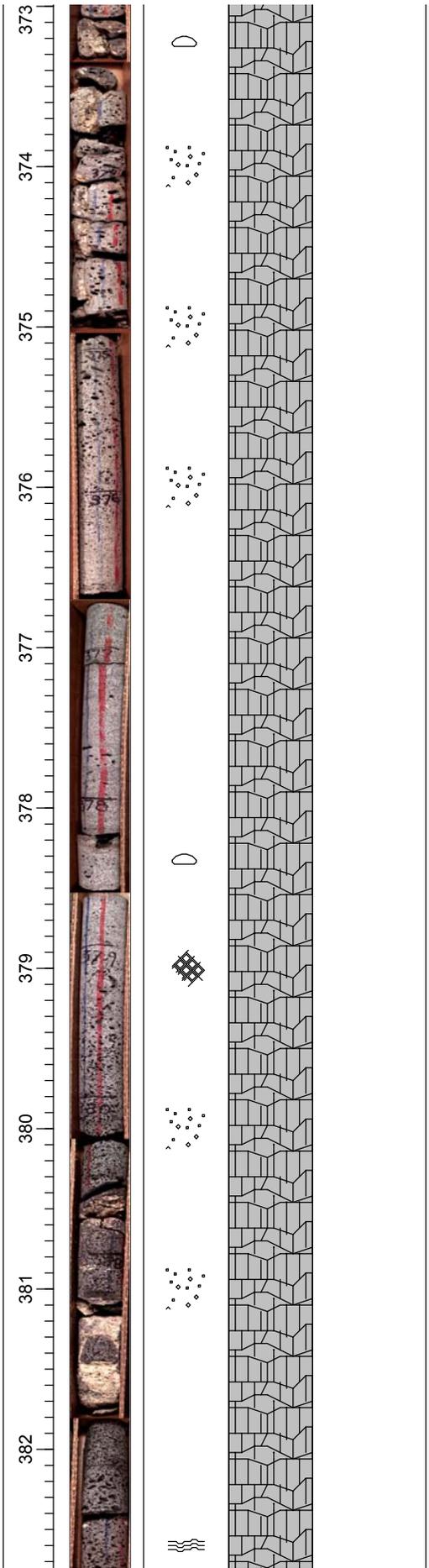


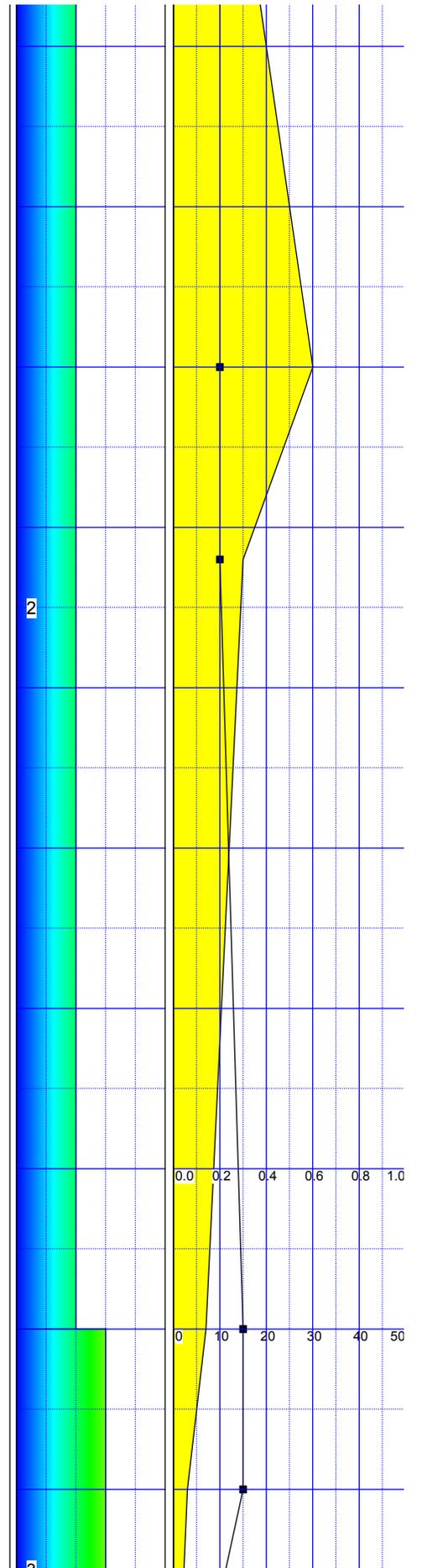
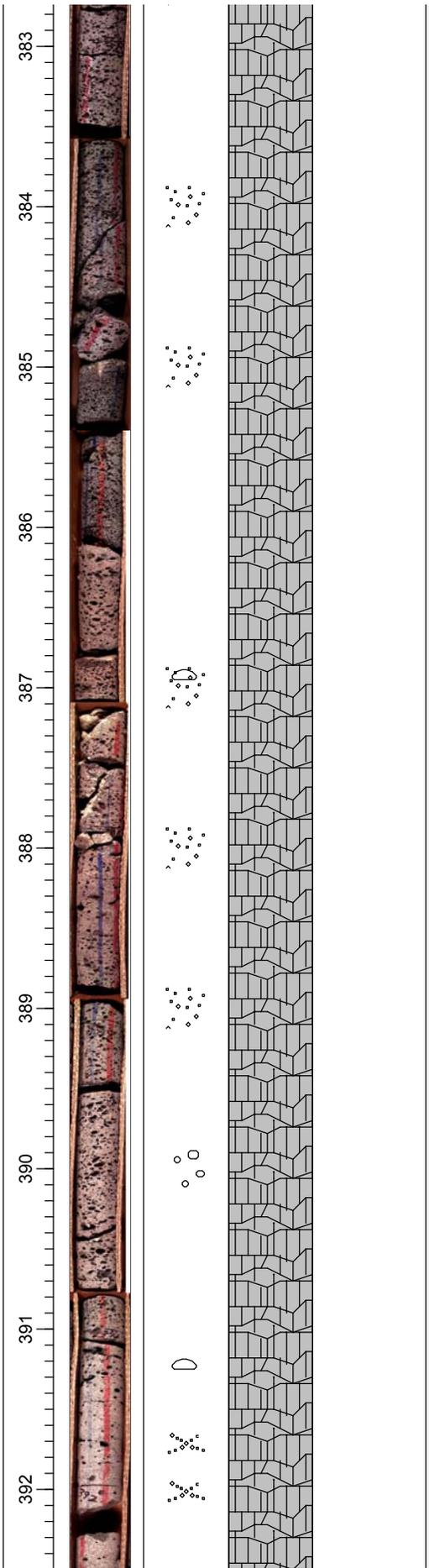


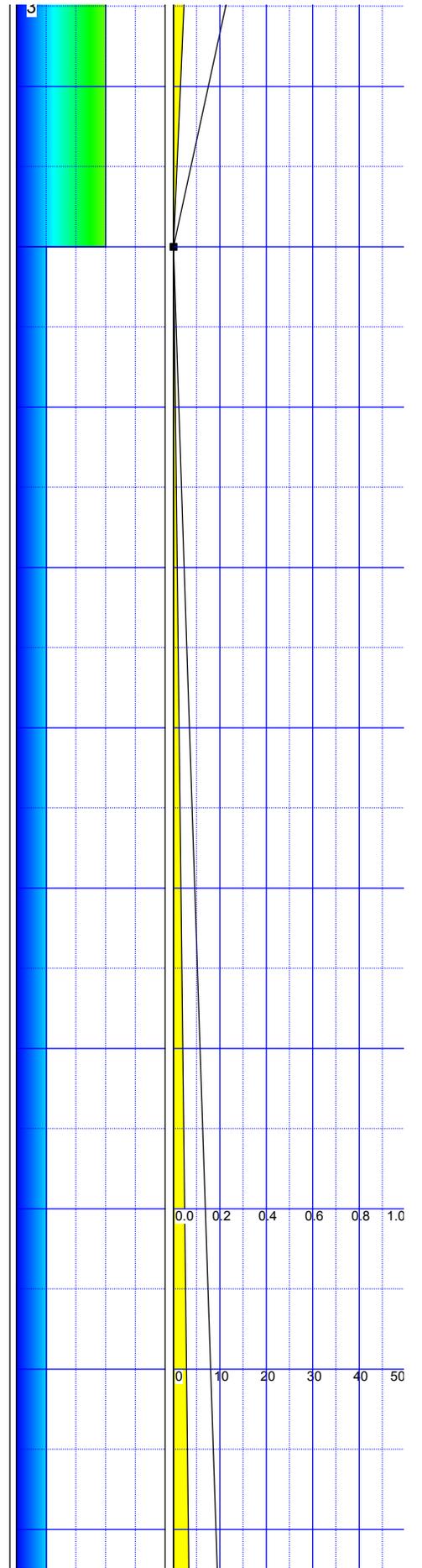
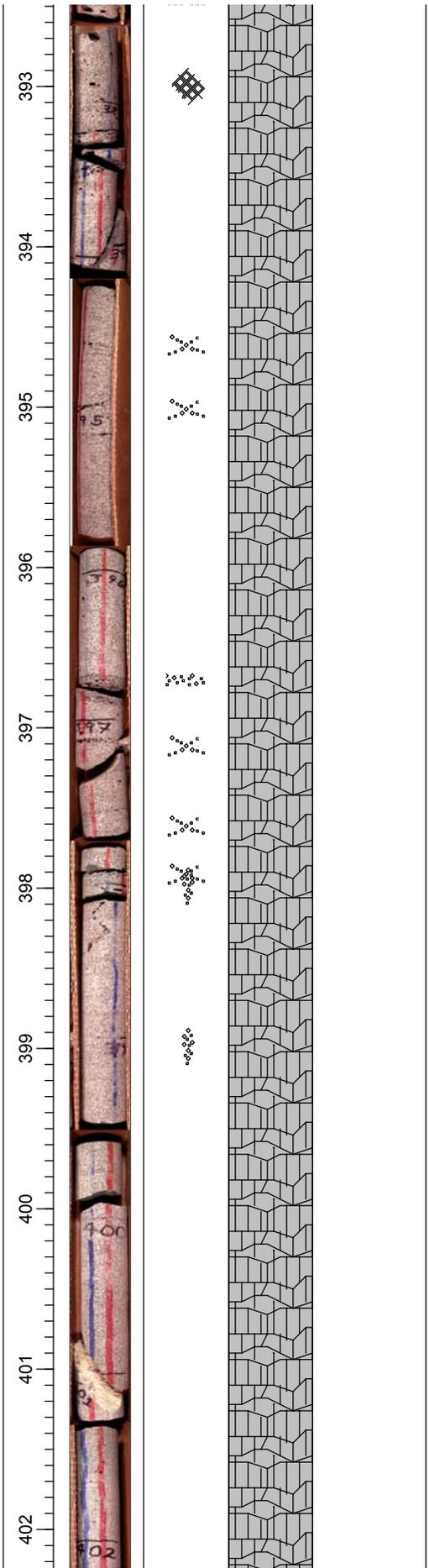


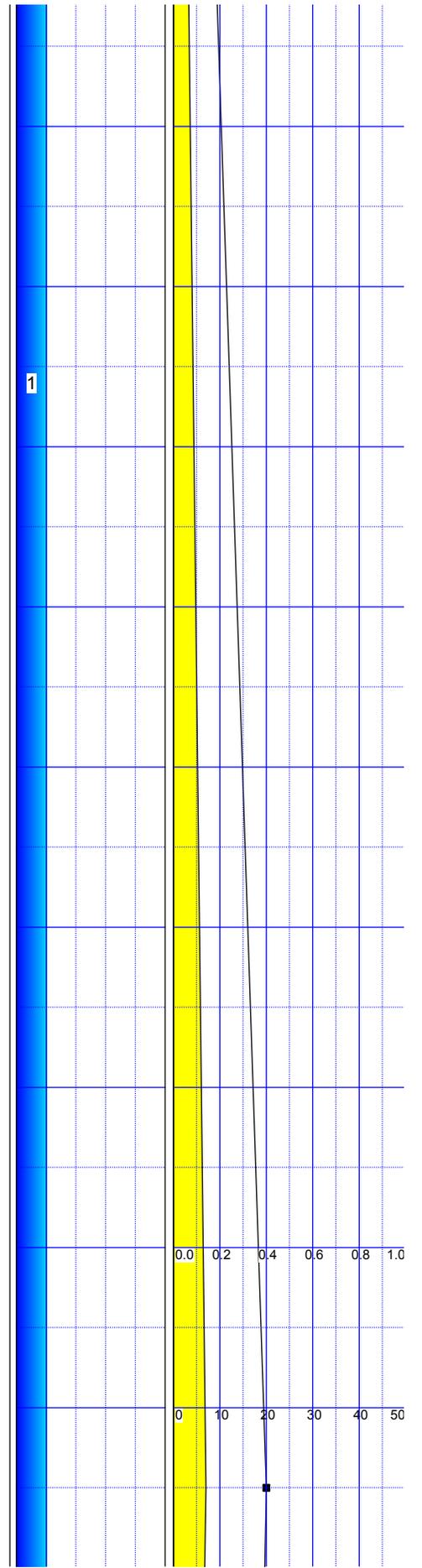
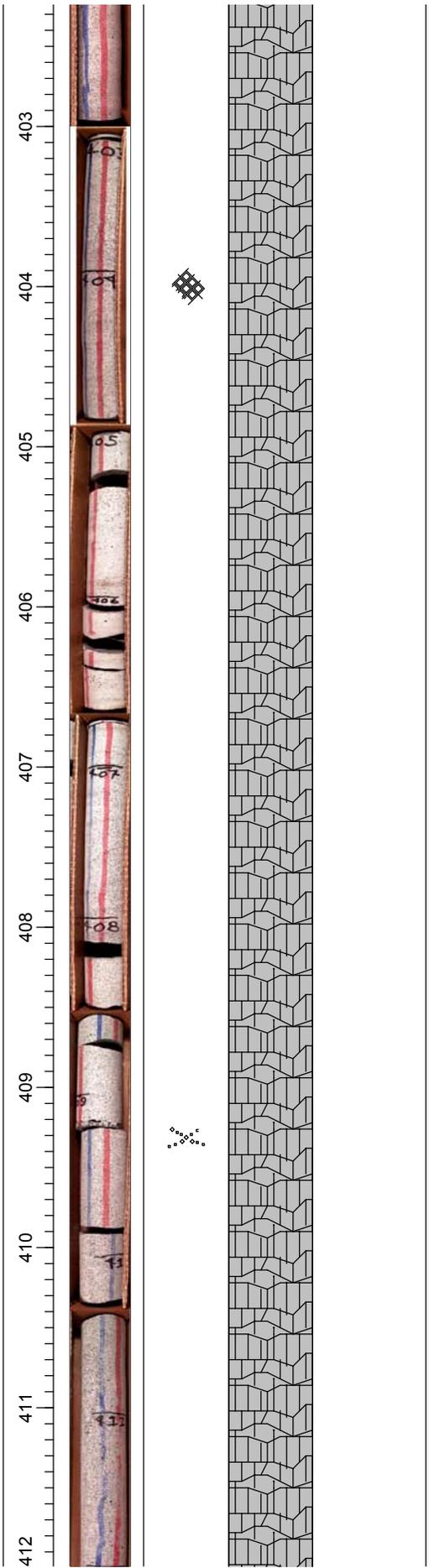


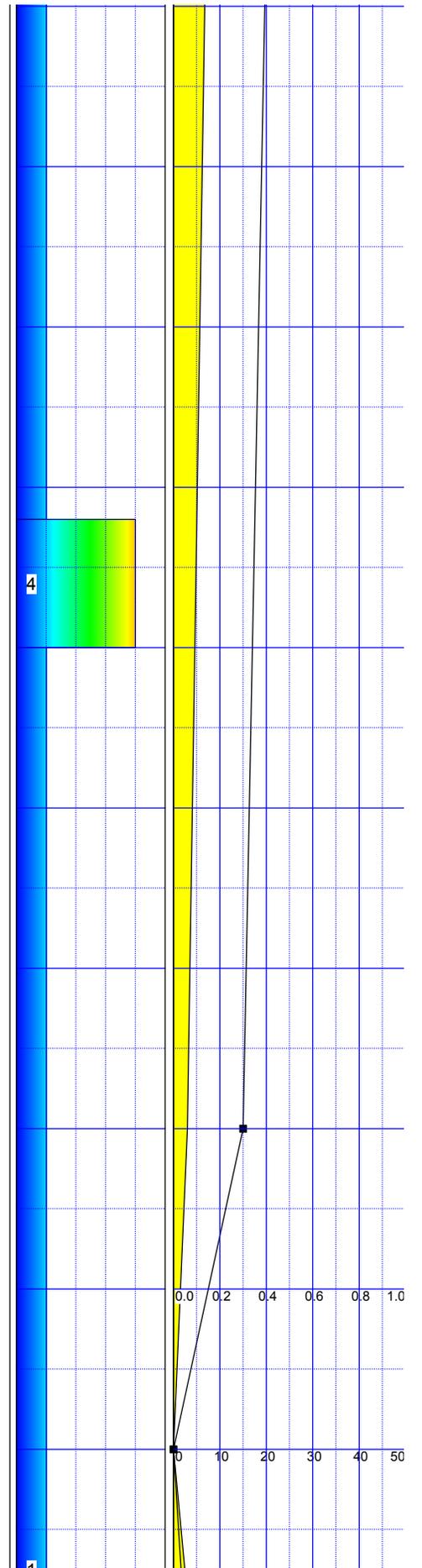
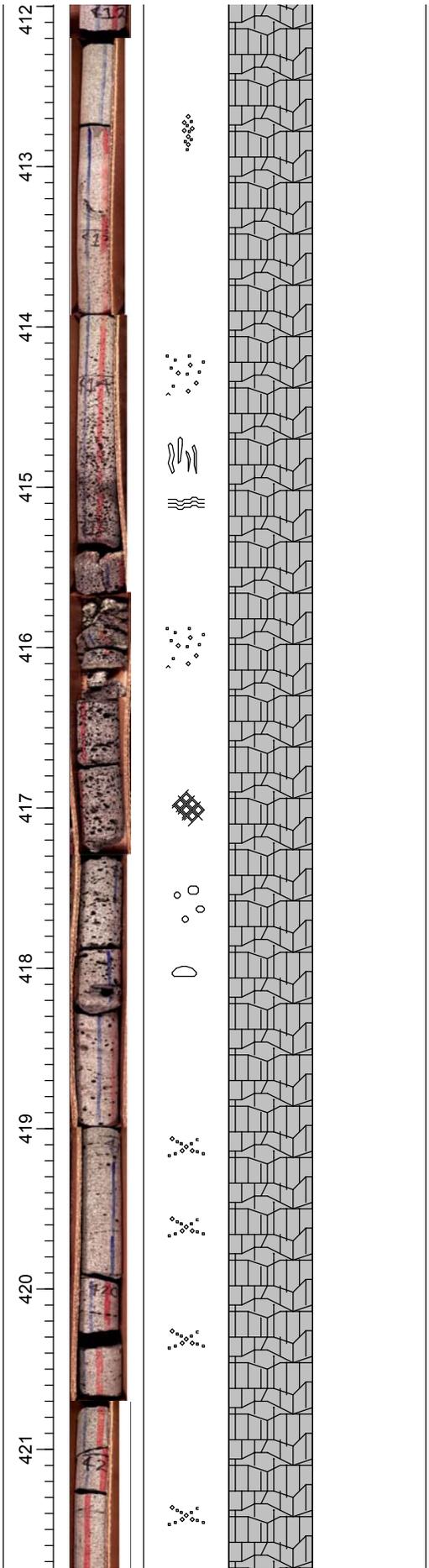


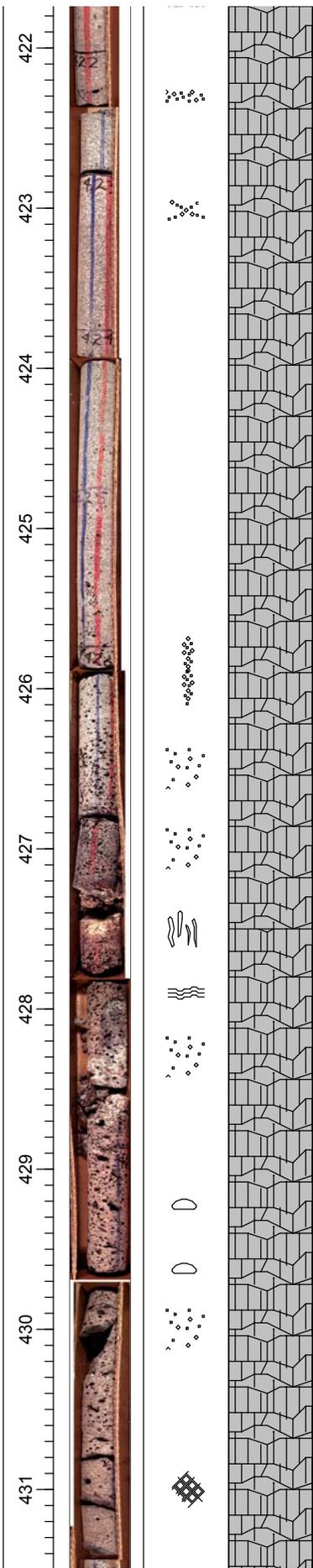




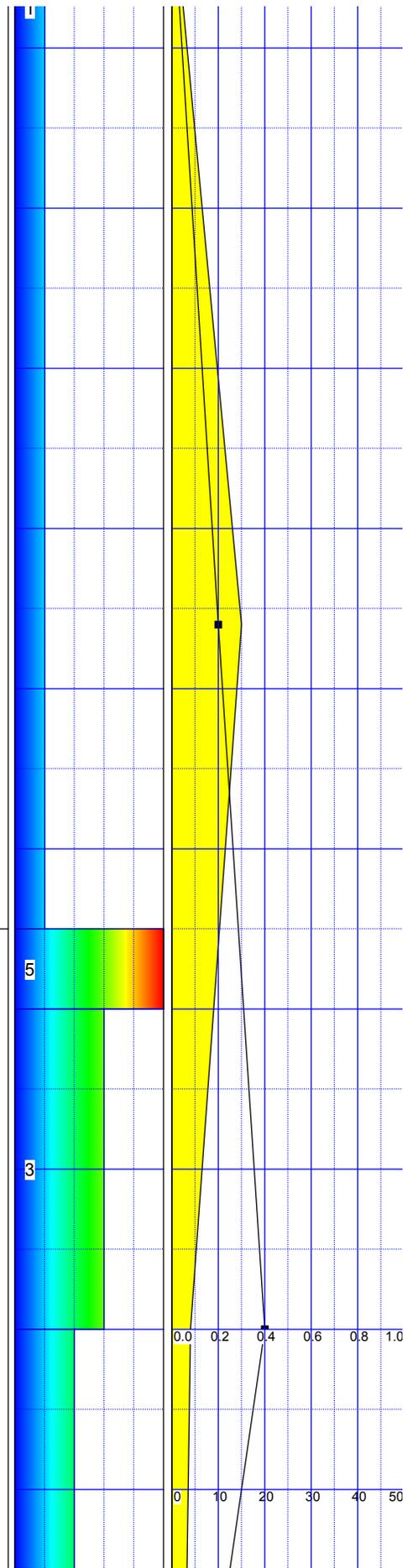


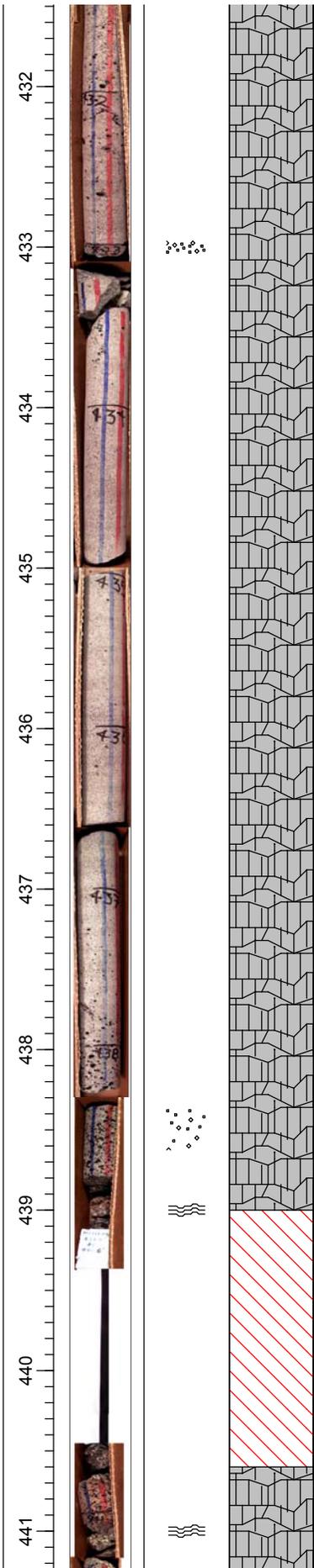






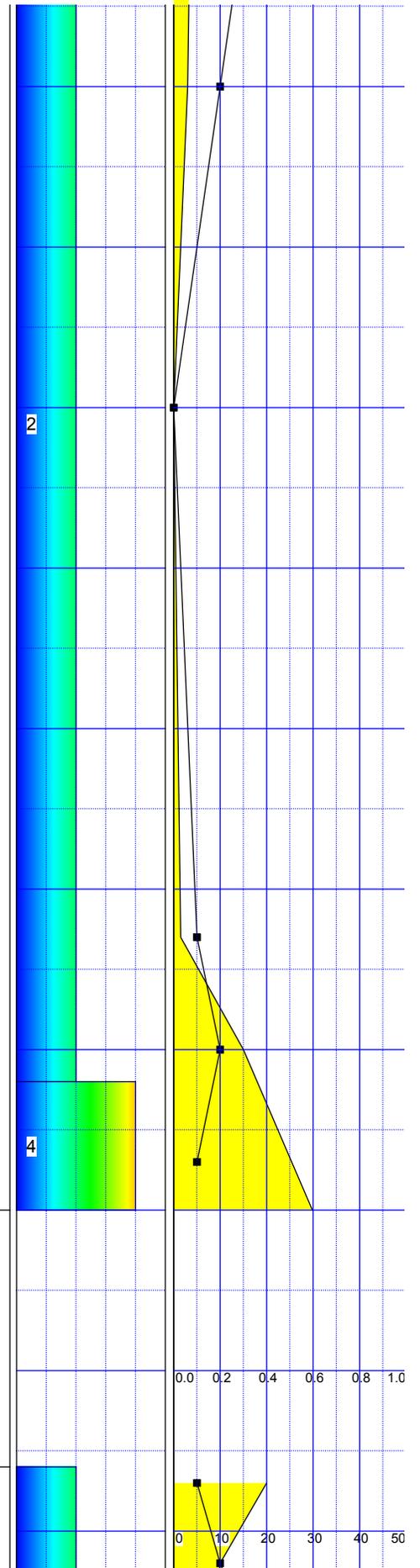
**BASALT: COLOR:** 10R 4/2 grayish red at top of interval, gradually changing to N5 medium grey at about 435 ft  
**TEXTURE:** Aphanitic, microporphyritic, vesicular from top to 431.3 ft, diktytaxitic with large vesicles from 431.3 to 433.7 ft, diktytaxitic to 437 ft, increasingly vesicular to base, flow/mold structure at base  
**COMPOSITION:** 70% sub-millimeter euhedral white plagioclase laths form a felted matrix with about 15% 0.5-1.0 mm subhedral green olivine microphenocrysts in spaces between plagioclase microphenocrysts, rest is reddish-grey groundmass  
**XENOLITHS/AUTOLITHS:** None noted  
**ALTERATION:** Blackish red oxidation at base of interval, non-calcareous very pale orange to buff film on fractures and inside vesicles at 428.5 ft, 433 ft, and at base of interval

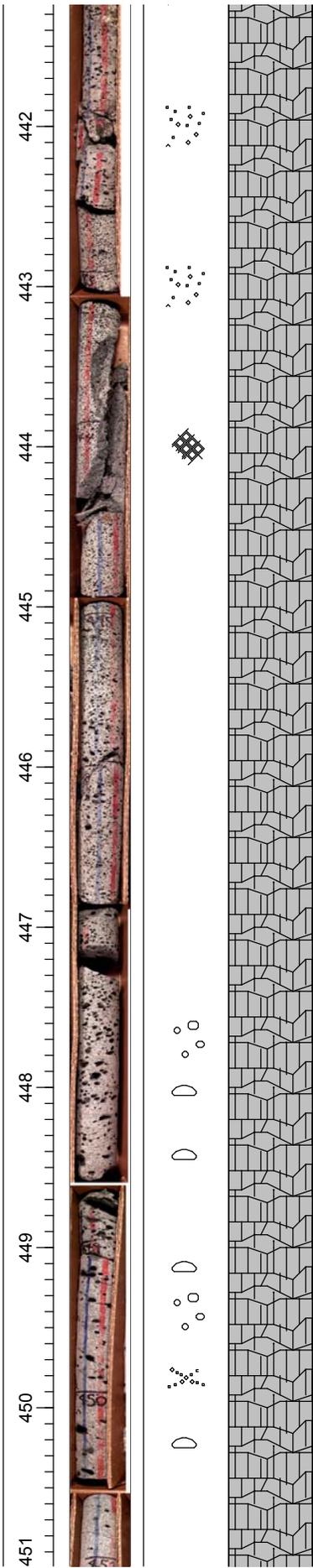




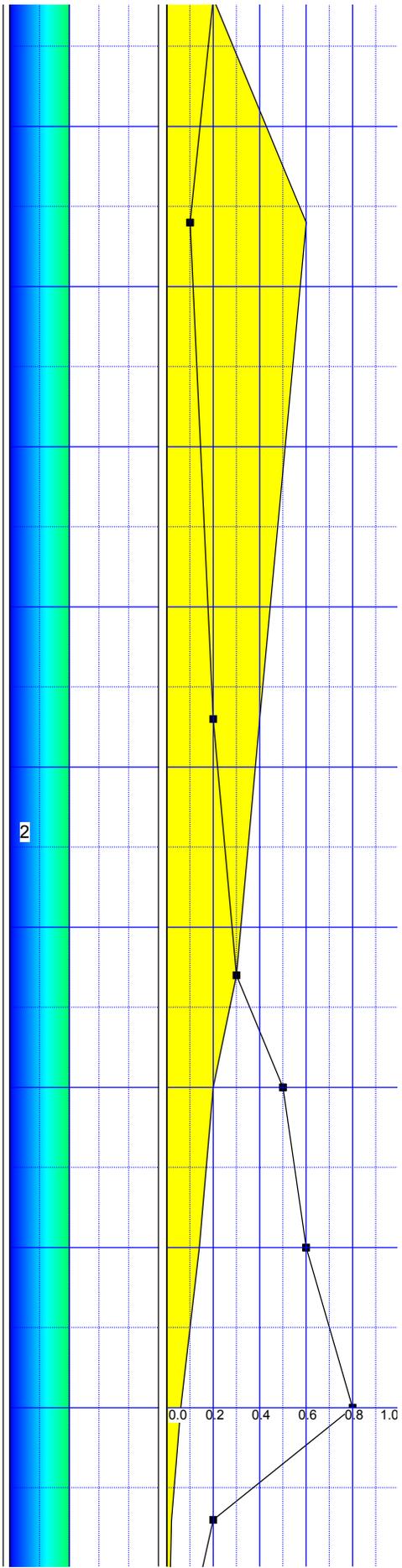
MISSING INTERVAL

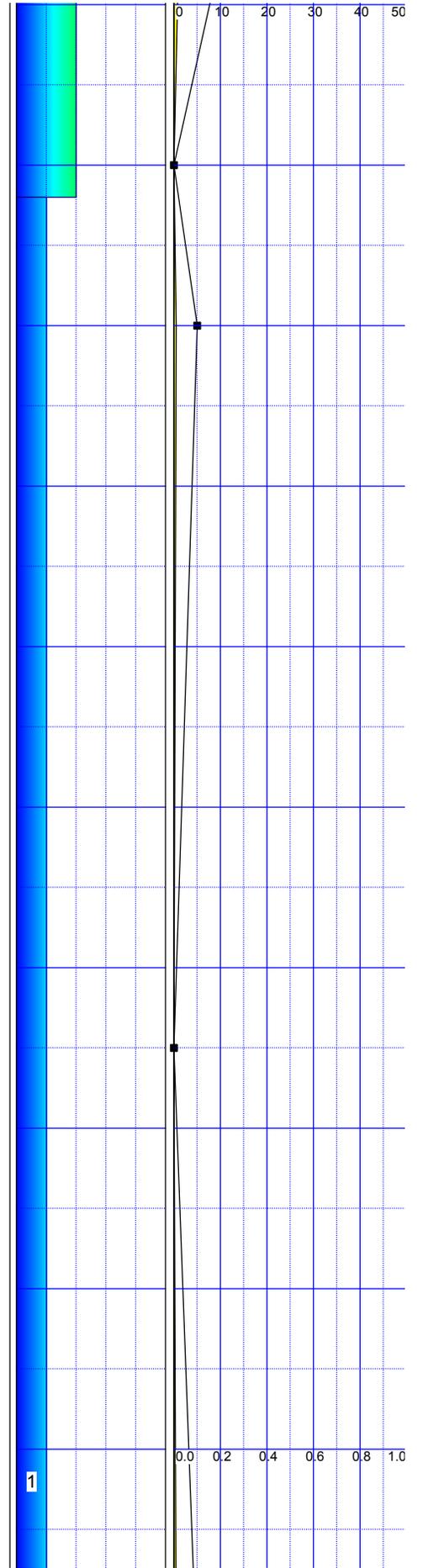
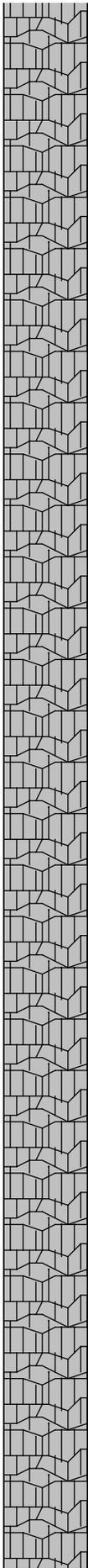
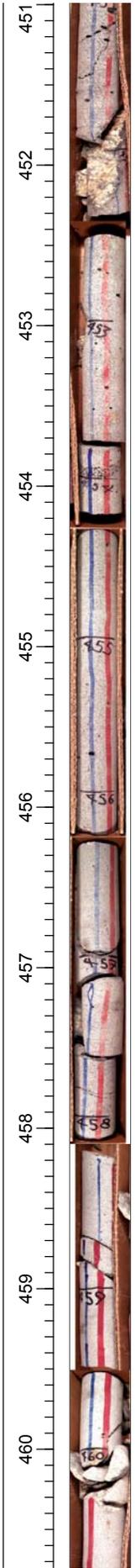
BASALT: COLOR: 10R 4/2 Greyish red at top changing gradually to N5 medium grey by 441.2 ft,  
 TEXTURE: Aphanitic, vesicular from top to 450 ft, diktytaxitic and vesicular from 444 ft to 458 ft with vesicles increasing in size and decreasing in number to 456 ft, diktytaxitic from 456 to base, increasingly vesicular from 456 ft to base, base of interval is

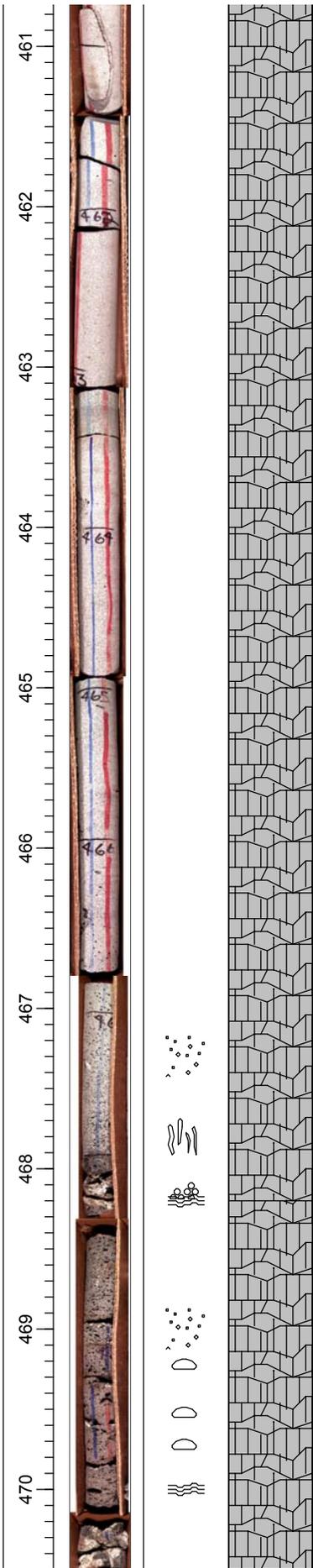




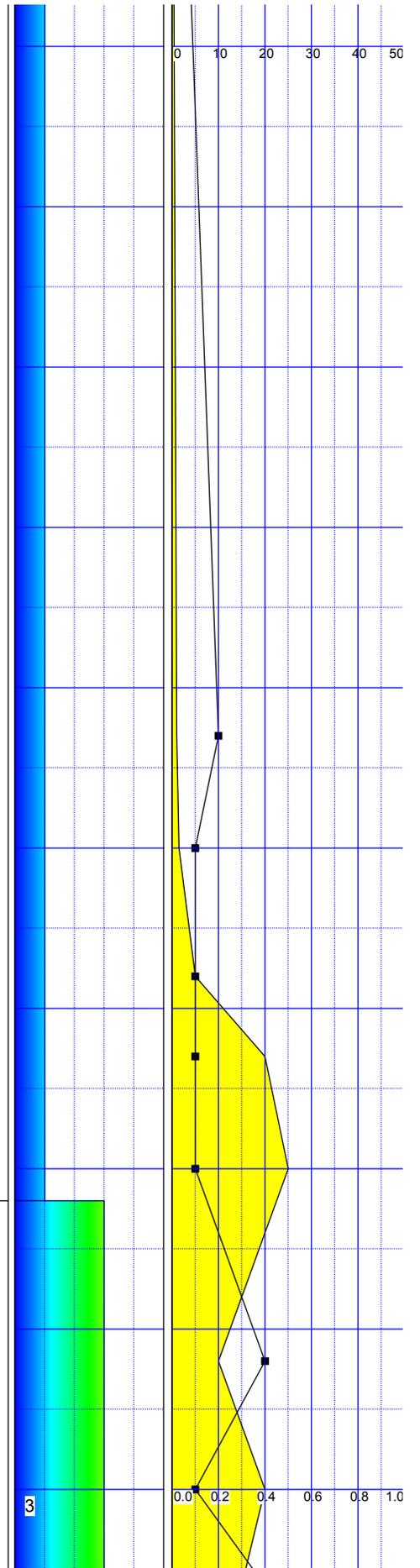
glassy  
**COMPOSITION:** Microporphyritic, randomly oriented 75% submillimeter euhedral plagioclase microphenocrysts form a felty matrix, 15% 1-2 mm green olivine microphenocrysts in plagioclase framework spaces  
**XENOLITHS/AUTOLITHS:** Approximately 1.0 x 0.5 in greyish-white xenolith at 467.3 ft, non-calcareous  
**ALTERATION:** Reddish oxidation at top and base, cream to tan clay in fractures and at top of interval

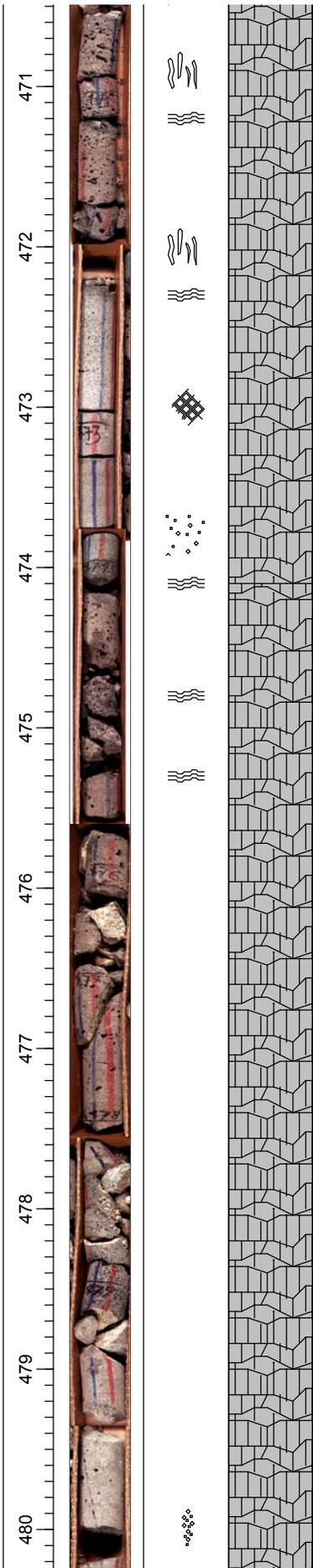




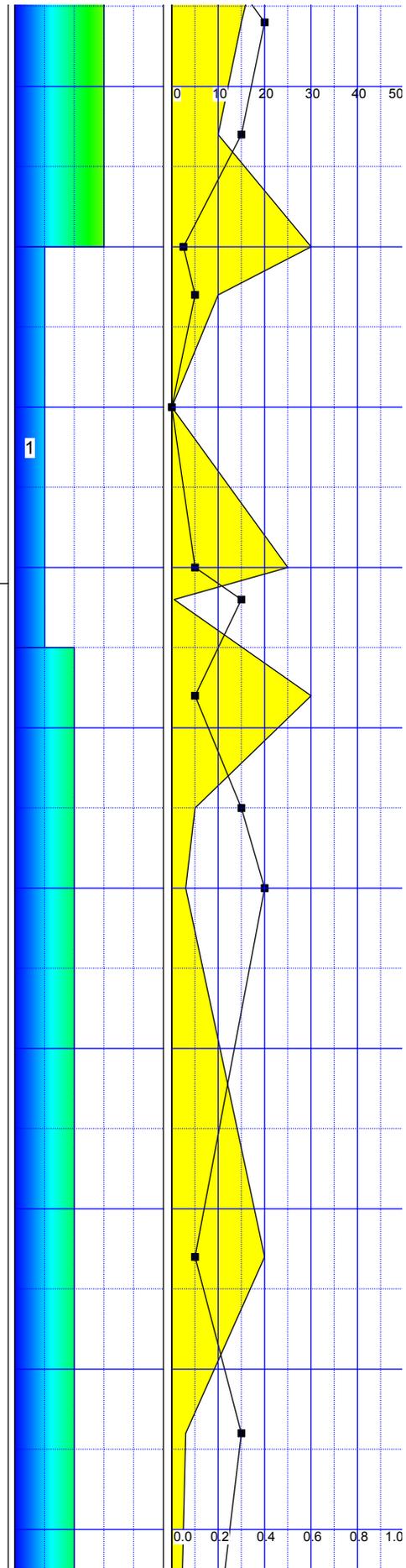


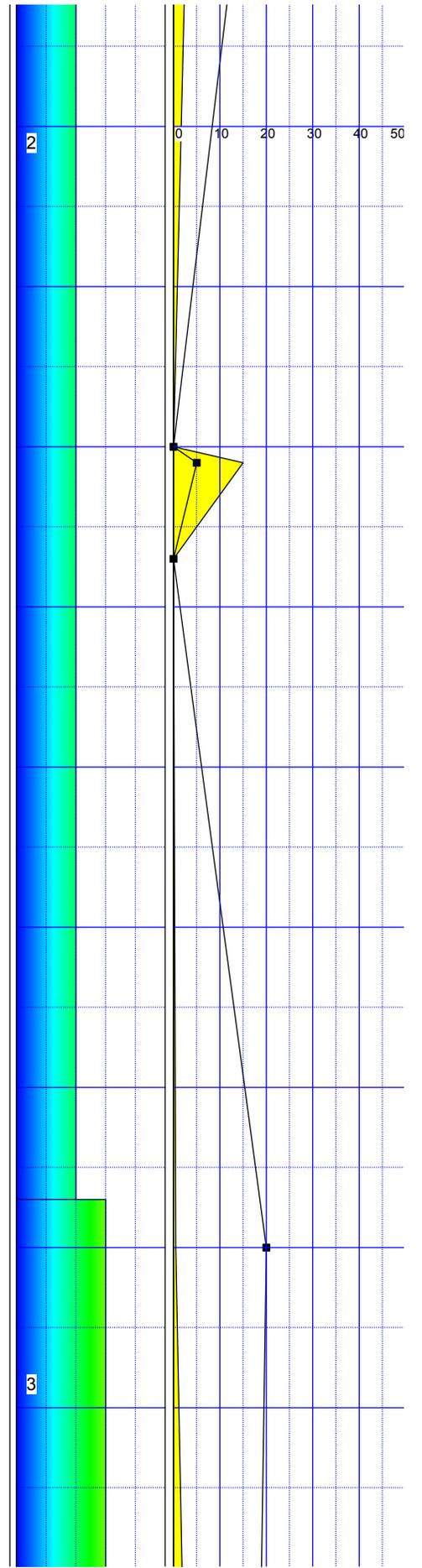
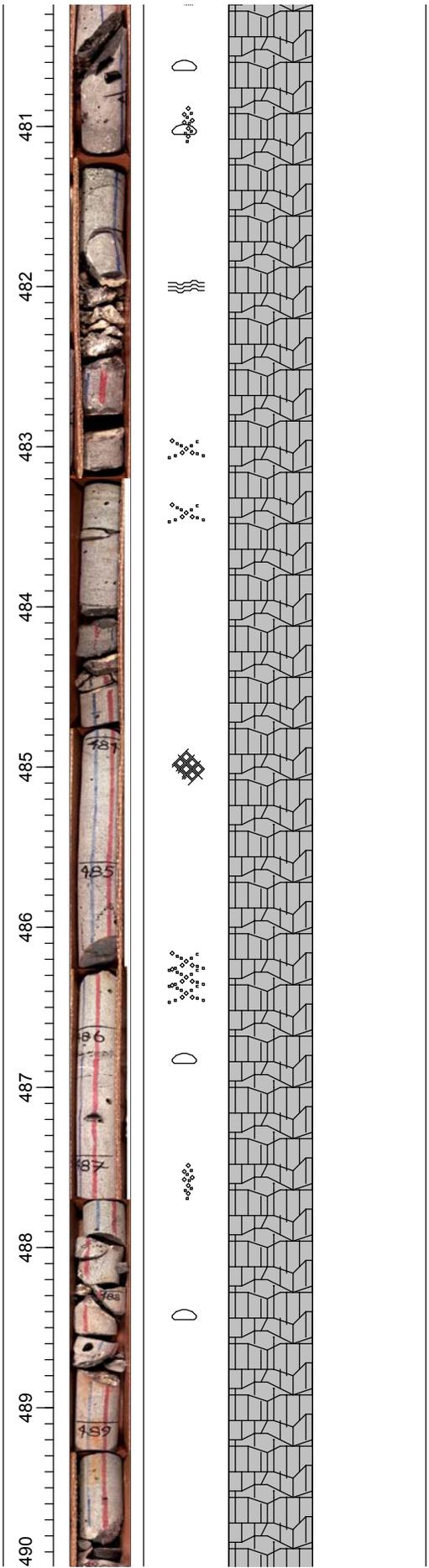
**BASALT: COLOR:** N3 dark grey  
**TEXTURE:** Aphanitic, vesicular from top to 472, diktytaxitic to 474 ft, vesicular to base  
**COMPOSITION:** 75% submillimeter white plagioclase randomly arranged in framework, with about 15% anhedral to subhedral green olivine microphenocrysts in framework space, olivine is in clumps of 8-15 microphenocrysts  
**XENOLITHS/AUTOLITHS:** None noted  
**ALTERATION:** Calcite at top of interval and inside vesicles at 471 and 472 ft, reddish oxidation inside vesicles to 471 ft, and at base of interval

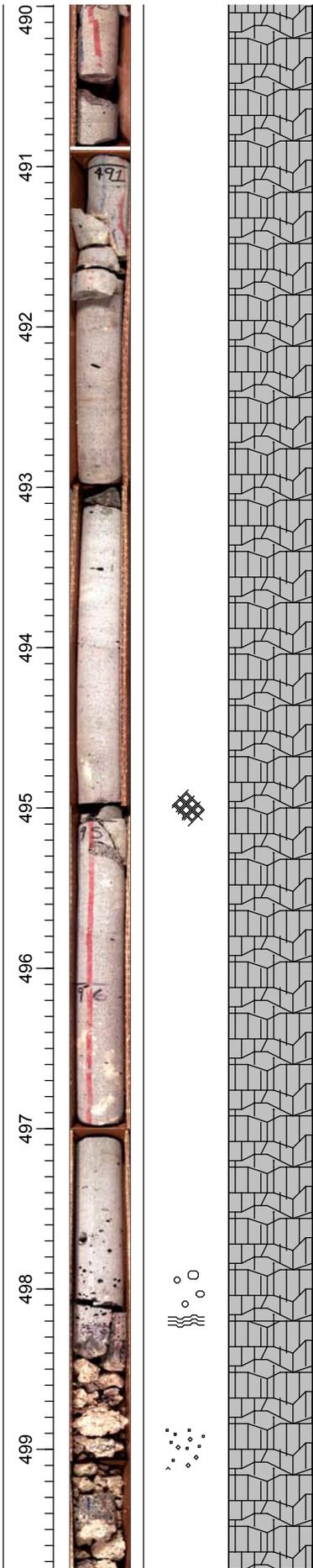




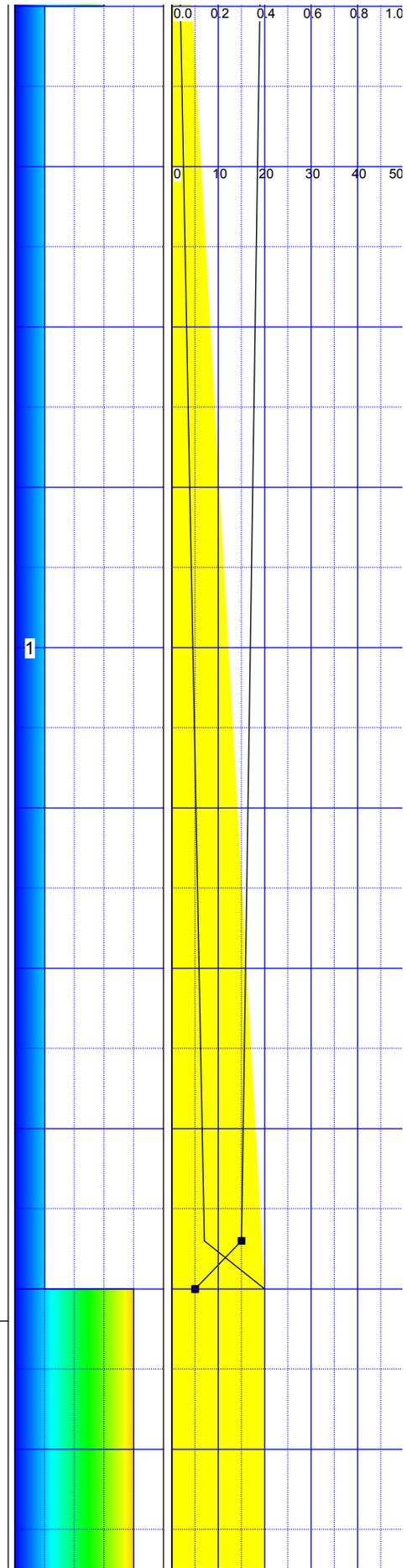
**BASALT: COLOR:** 10R 4/2 at top of interval changing to N5 medium grey by 477.6 ft  
**TEXTURE:** Aphanitic, glassy, vesicular from top of interval to 479 ft, diktytaxitic throughout, vesicular from 497.5 ft to base  
**COMPOSITION:** 15-20% sub-millimeter to millimeter subhedral green olivine microphenocrysts in glassy matrix, which contains white plagioclase laths visible under 14x magnification  
**XENOLITHS/AUTOLITHS:** None noted  
**ALTERATION:** Calcite in vesicles at top, calcareous sediment in fractures at 475, 476-477 ft, 480.6 ft, 483, 483.6, 491.8, 495 ft, and at base. Reddish oxidation at top

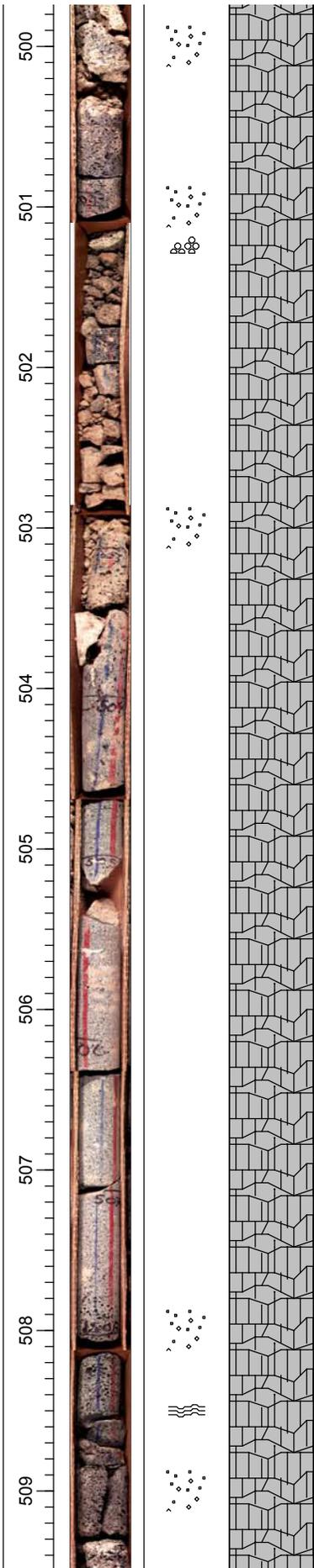






**BASALT: COLOR:** 5YR 4/1 brownish grey changing to 10R 4/2 at 535.3 ft  
**TEXTURE:** Porphyritic, vesicular from top of interval to 519 ft, diktytaxitic with large vesicles to 533 ft, diktytaxitic to 533.2 ft, vesicular to 540 ft with vesicle size increasing and vesicle number decreasing, then diktytaxitic to total depth of well.  
 Note: The base of this flow was not penetrated, and may be much thicker than represented here.  
**COMPOSITION:** Large (3-15 mm) white euhedral plagioclase phenocrysts in small (5 mm) or large (2 cm) somewhat stellate groups are found in a groundmass comprised of sub-millimeter microphenocrysts, up to 65% of which are euhedral white, randomly oriented plagioclase microphenocrysts and 15% are anhedral to subhedral brown to green olivine microphenocrysts,





which tend to be more prevalent in the stellate plagioclase phenocryst groups.  
 XENOLITHS/AUTOLITHS: None noted  
 ALTERATION: Calcareous clay in fractures at top of interval and at 522.5 and 526.6 ft, very pale orange non-calcareous film inside vesicles and on fractures at 532.2, 533.2, 539, and 540 ft.

