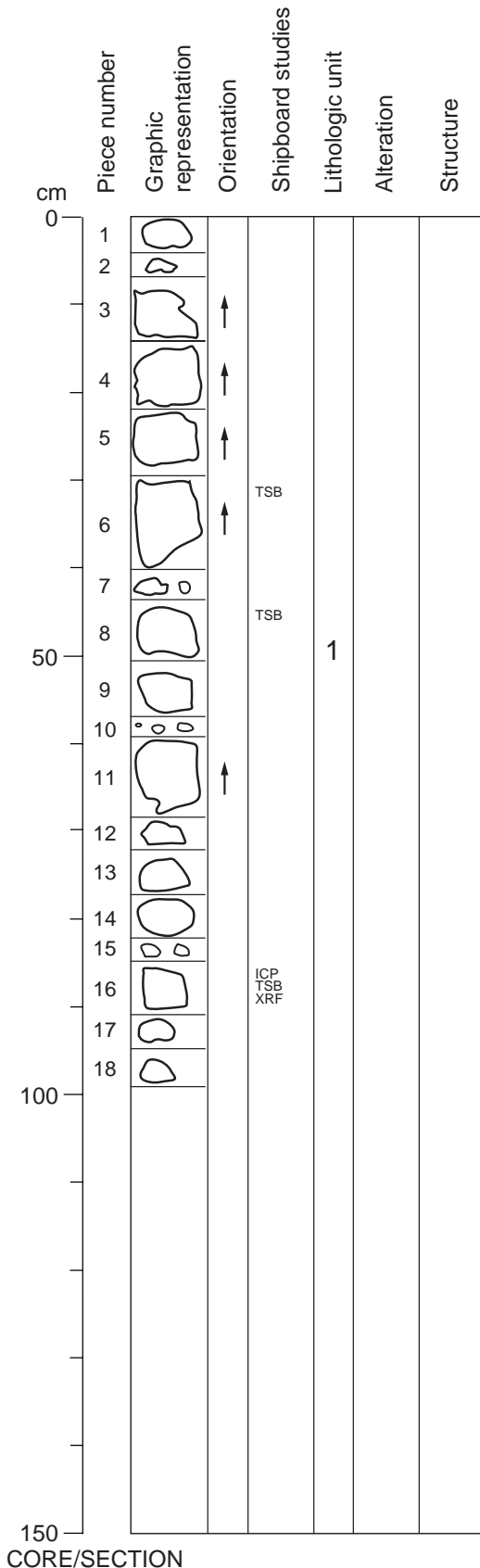


Core Photo

187-1157A-1W (0.0 - 200.0 mbsf)						
METERS	CORE AND SECTION	GRAPHIC LITH.	DISTURB.	SAMPLE	COLOR	DESCRIPTION
0.0	1	[Pattern]	SS		dk BR	CLAY
0.1					med BR	
0.2	2	[Pattern]	SS		dk BR	Core 187-1157A-1W contains a moderately to highly drilling disturbed interval of clay. Section 187-1157A-1W-1 varies between dark brown and medium dark brown. Contacts are smeared but appear sharp in most cases, although most intervals are intimate mixtures with wisps of medium brown clay in dark brown clay or vice versa. The lower half of the section is soupy. A smear slide from a dark brown interval contains brown clay, abundant siliceous microfossil fragments, and rare rounded translucent brown volcanic glass shards and colorless crystals.
0.3					med BR	
0.4	3	[Pattern]			dk BR	Section 1W-2 contains several thin intervals of olive gray clay in a medium brown clay matrix. From 32 to 78 cm is a gradational change from dark brown to medium brown, although the color change is caused by increasing discrete intervals of the latter in the former, rather than a smooth color change. The lower part of this section is highly drilling disturbed, but all sediment is siliceous.
0.5					mdk BR	
0.6	4	[Pattern]			med BR	Sections 1W-3 and 4 are characterized by sharp color changes over intervals from a few mm to several cm between medium brown and dark brown siliceous clay. Contacts are highly drilling disturbed along the edges of the core, but range from irregular and sharp to diffuse over a few mm in the center of the core. The lower part of Section 1W-3 and the upper part of Section 1W-4 are soupy.
0.7					mdk BR	
0.8	5	[Pattern]	SS		..	Section 187-1157A-1W-5 has a sharp but irregular contact between medium brown and medium dark brown siliceous clay that dips about 85° as exposed on the core face, from about 10 to 70 cm.
0.9					mdk BR	
1.0	6	[Pattern]			dk BR	In Section 187-1157A-1W-6, most internal features are destroyed or seriously disrupted by drilling disturbance. Color variations in siliceous clay are apparent, but the core is highly disturbed to soupy.
1.1					med BR	
1.2	7	[Pattern]			mdk BR	The top of Section 187-1157A-1W-7 is similar to all the sections above, but at the base is a transition to calcareous clay. A distinct color change at 49 cm marks the top of a silty clay layer that is siliceous. At the bottom of the section is a light brown clay that effervesces slightly in 10% HCl.
1.3					..	
1.4	8	[Pattern]			med BR	Section 187-1157A-1W-CC continues the same siliceous/calcareous interval as in the Section 1W-7, but the bottom of this interval is marked by a sharp contact with very dark brown, purely siliceous clay. Below the dark brown clay is a thin interval of calcareous ooze, and the bottom of the section contains a moderately plagioclase-olivine phyric basalt with a thin glassy rim.
1.5					..	
1.6	9	[Pattern]	SS		..	
1.7			SS		..	

Core Photo



187-1157A-2R-1

UNIT 1: BASALTIC RUBBLE WITH FRAGMENTS OF BASALT-CARBONATE BRECCIA

PIECES 1-18

This section is composed of basaltic rubble with one interval (Pieces 3-7) of basalt-carbonate breccia. The pieces of breccia may represent one of several clasts in a rubble pile.

PIECES 1, 2 and 8-18 Basaltic Rubble

This is basaltic rubble characterized by multiple weathered surfaces. Two different igneous lithologies occur: a dark gray, aphyric basalt with groundmass olivine (Pieces 12, 13, 16, 17, 18, and parts of Pieces 3 - 6) and a medium gray plagioclase - olivine phyric basalt (Pieces 1, 2, 8, 9, 11, 13, 14, 16, plus part of Piece 6). The phenocryst content and size of phenocrysts varies slightly among the phyric pieces. Piece 11 is slightly more phenocryst rich (~4% plagioclase, 2% olivine) than the other phyric samples, which tend to be ~1% plagioclase and 1% olivine. Plagioclase and plagioclase + olivine clusters occur in the phyric samples.

	Abundance %	Size (mm)		Shape
		avg.	max. min.	
Plagioclase	1-4	2	5	prismatic to tabular
Olivine	1-2	1	2	equant
Total	2-6			

Note information on phenocrysts summarized above applies only to the moderately plagioclase-olivine phyric basalt and is not an average for the section.

GROUNDMASS: Both lithologies are microcrystalline to fine grained

VESICLES: There are <1% of <0.5 mm diameter vesicles in some aphyric basalt pieces.

Pieces 3-7 Basaltic Breccia

This is basaltic breccia, cemented by carbonate sediment. The sediment infill, which is a calcarenite, contains less than 5% sand- to gravel-size lithic fragments. It is not possible to determine from the recovered material whether the large basaltic fragments are part of a clast-supported or matrix-supported deposit, since the clast dimensions are generally larger than the core diameter. However, Piece 6 has at least one matrix supported clast of aphyric basalt.

CLAST MATERIAL: Only basaltic clasts are visible in the breccia. The clasts have angular outlines and range from 3 to >8 cm in maximum dimension. A glassy margin on Piece 5 consists of a thin palagonite cap (~1 mm thick) and ~2 mm of clear glass. Both aphyric (Pieces 3-7) and phyric (Piece 6) clasts are present and their petrography is similar to the aphyric and phyric basalts described above (Pieces 1, 2 and 8-18). Piece 6 is the only piece to include both aphyric and phyric clasts in the same sample.

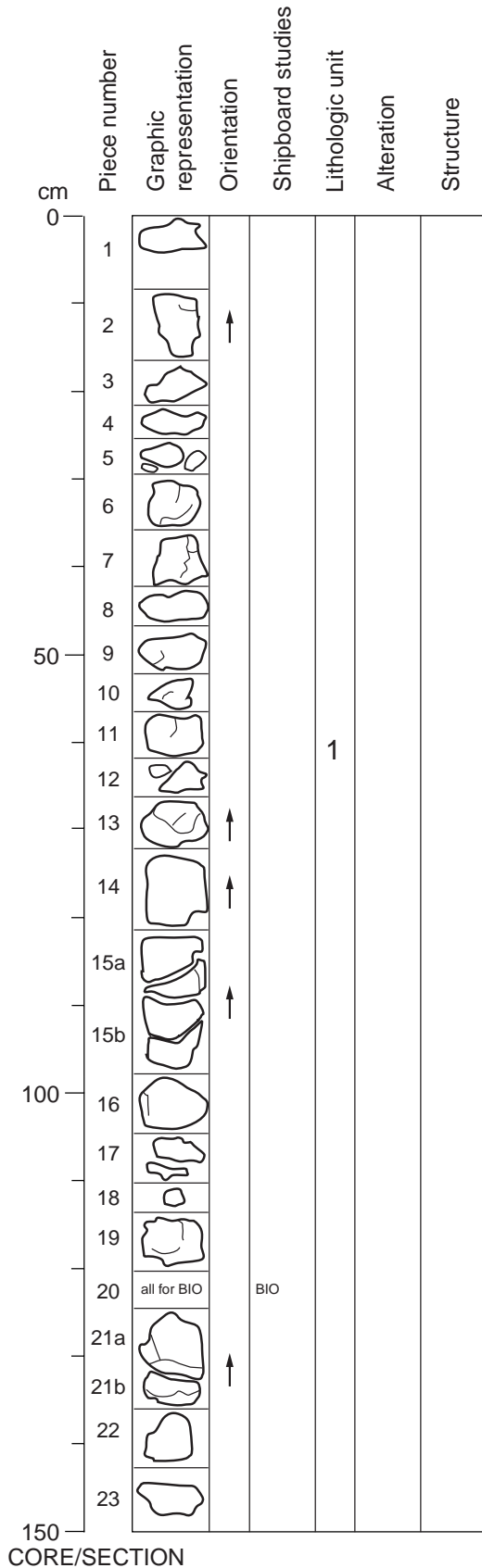
MATRIX: Thick fragments of a mottled, pinkish gray calcarenite adhere to the surfaces of Pieces 3, 4, 5, and 6. Pieces 4 and 6 also contain sand- to gravel-size angular clasts of bleached palagonite and altered basalt. In Piece 4 these clasts are rare and small (<7 mm); in Piece 6 they range up to 1.2 cm in length and are more abundant (~1%), although concentrated in one small area of the sample. The sediment contains small (<0.5 cm) patches of Mn oxide throughout.

VEINS/FRACTURES: No veins were observed. Unfilled fractures occur in Pieces 8 and 10.

ALTERATION: Overall the basalt in this section is slightly to moderately altered. Olivine has been replaced by Fe oxyhydroxide in oxidized margins at the edges of pieces, e.g. Pieces 1, 2, 4, 5, 6, 8, 9, and 14. These oxidation halos range from 5 to 10 mm in width and constitute between 20 and 50% of the piece. In Pieces 4-6 these alteration halos lie adjacent to the carbonate sediment. However, not all clasts have alteration halos, indicating that the weathering and/or alteration associated with the halos occurred before formation of the deposit.

STRUCTURE: Rubble pile.

Core Photo



187-1157A-3R-1

UNIT 1: BASALTIC RUBBLE WITH FRAGMENTS OF BASALT-CARBONATE BRECCIA

PIECES 1-23

This section is composed of basaltic rubble with one interval (Pieces 12-19) of basalt-carbonate breccia. The pieces of breccia may represent one of several clasts in a rubble pile.

PIECES 1-11 and 20-23 Basaltic Rubble

This is basaltic rubble characterized by multiple weathered surfaces. Two different igneous lithologies occur: a dark gray, aphyric basalt with groundmass olivine (Pieces 1, 2, 3, 4, 5, 6, 10, 21, 22, and 23) and a medium gray plagioclase - olivine phyric basalt (Pieces 7, 8, 9, and 11).

INTERNAL CONTACTS: Glassy or chilled margins were recovered on Pieces 4, 7, 9, 21, 22, and 23 (working half only). Fresh clear glass is rare. Pieces 4, 7, 22, and 23 retain less than 2 mm of glass + spherulites; Piece 9 has only a very small fragment of clear glass (+ phenocrysts) on one edge. Although no glass was recovered on Piece 21, this sample has a larger than normal chilled margin (>2.5 cm) and the spherulites in it are larger than normal (up to 2 mm in diameter); the outer most edge of the spherulites is altered to a buff brown.

PHENOCRYSTS: **Abundance** **Size (mm)** **Shape**

	%	avg.	max.	min.	
Plagioclase	6	2	5	<1	prismatic
Olivine	1	1	2	<1	equant
Total	7				

Note that information on phenocrysts summarized above applies only to the moderately plagioclase-olivine phyric basalt and is not an average for the section.

GROUNDMASS: both lithologies are microcrystalline to fine grained

VESICLES: Rare vesicles (<<1%) are either unfilled, or are lined with a blue cryptocrystalline silica.

PIECES 12-19 Basaltic Breccia

This is a poorly sorted, basaltic breccia, cemented by a micritic calcite, clay and sparry calcite.

CLAST MATERIAL: Only clasts of basaltic derivation are visible in the breccia. The clasts have angular outlines and range from >12 cm in maximum dimension to sand and gravel size fragments suspended in the sediment matrix; the latter material is described below along with the matrix material. Both aphyric (e.g., Pieces 18 and 19) and phyric (e.g., Piece 12) clasts are present, and their petrography is similar to the aphyric and phyric basalts described above (Pieces 1-11, 20-23). Aphyric basalt tends to dominate among the clasts.

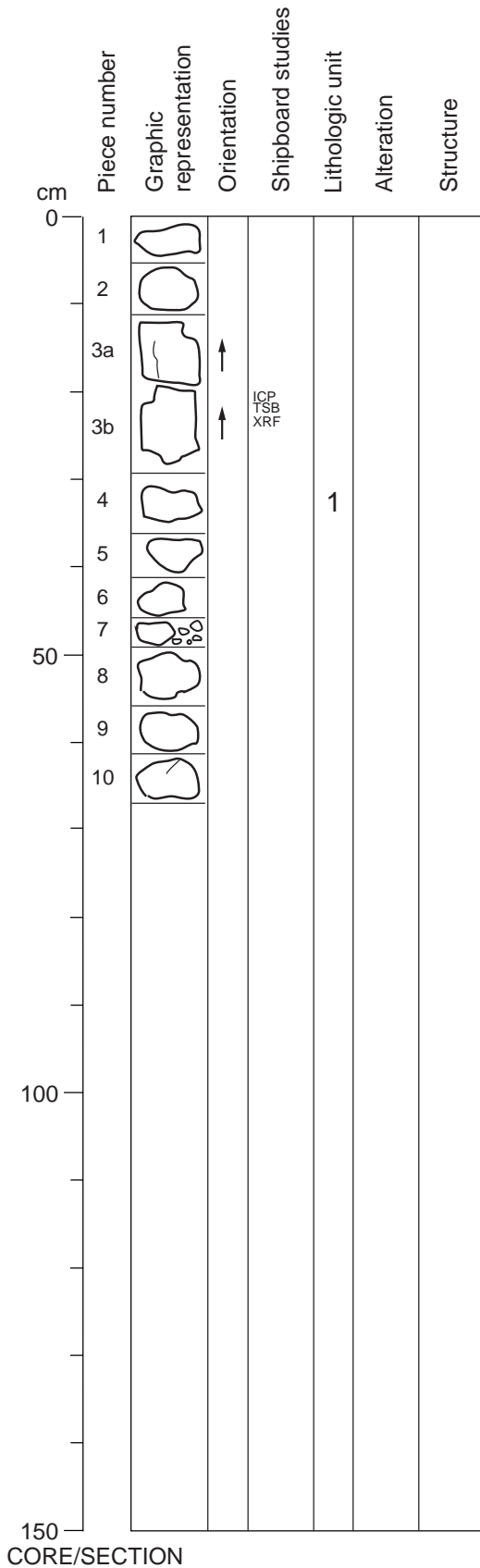
MATRIX: The matrix is a lithic-rich (~80%) clastic sediment, cemented by a mixture of pale pink to buff clay (non-reactive in 10% HCl), micritic calcite and an anastomosing network of sparry calcite that both encircles and cuts across clasts. The lithic fragments in the sediment matrix range from sand size particles of palagonite and altered olivine(?) to gravel size clasts of altered basalt. Among the smaller lithic fragments, material associated with basaltic chilled margins predominates, e.g., palagonite and altered spherulitic basalt. Calcite-filled vugs are present in the matrix of Piece 16.

VEINS/FRACTURES: No veins were observed and fractures are rare. An open fracture in Piece 15 is coated by a thin layer of calcite.

ALTERATION: Overall the basalt in this section is slightly to moderately altered. Olivine has been replaced by Fe oxyhydroxide in alteration halos along the edges of most pieces. These oxidized margins vary from 2 to 8 mm wide and constitute between 5 and 30% of discrete pieces. Some small clasts suspended within the sediment matrix are totally altered in this way. Olivine in the alteration halos of phyric samples is partially to totally replaced by Fe oxyhydroxide (e.g. Piece 9). In aphyric clasts, Fe oxyhydroxides are present in the groundmass (e.g., Piece 22). Zeolites(?) occur on Piece 7. Mn oxide concretions (~1 mm diameter) are present on the edges of most samples. In Pieces 12-19, most of the alteration halos lie adjacent to the carbonate sediment. However, not all clasts have alteration halos, indicating that the weathering and/or alteration associated with the halos occurred before formation of the deposit.

STRUCTURE: Rubble pile.

Core Photo



187-1157A-3R-2

UNIT 1: APHYRIC TO MODERATELY PLAGIOCLASE OLIVINE PHYRIC BASALT

PIECES 1-10

INTERNAL CONTACTS: Piece 3a (oriented) has a remnant of a chilled margin along the top of the piece. Only the spherulitic glass zone was recovered

PHENOCRYSTS:	Abundance %	Size (mm)			Shape
		avg.	max.	min.	
Plagioclase	2	1.5	4	<1	prismatic
Olivine	1	1	3	<1	equant
Total	3				

GROUNDMASS: Microcrystalline to fine grained

COLOR: Buff to medium gray

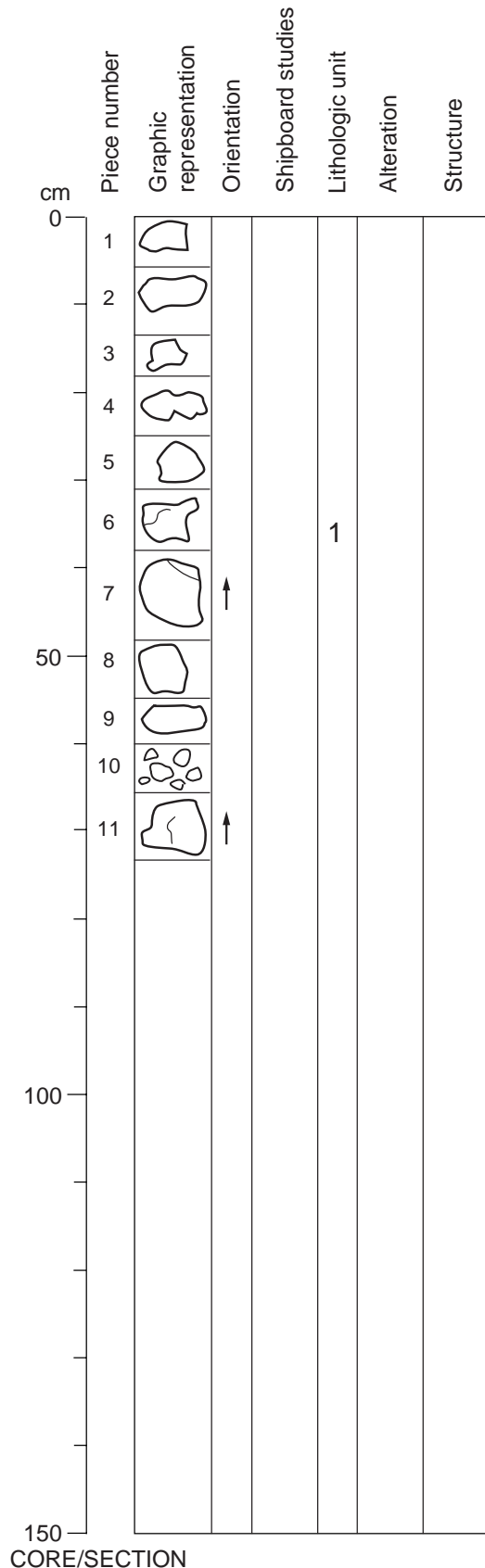
VEINS/FRACTURES: Small (<0.5 mm) open fractures occur in Piece 3a.

ALTERATION: Overall Pieces 1 to 4 are slightly altered. Pieces 5 to 10 are moderately to highly altered, with Pieces 5 and 7 being the most altered (>40%). Piece 3a has an oxidized margin 4 mm wide down one side; the outer surface adjacent to this edge is coated with clay, of which half is highly Fe stained. This surface extends down the side of Piece 3b as a greenish-yellow clay. Olivine is totally replaced by Fe oxyhydroxides in the most altered pieces. Pieces 1, 2, 4, 5, 6, 7, 8, 9, and 10 have weathered (not drilled) outer surfaces.

STRUCTURE: Not distinguishable

ADDITIONAL COMMENTS: Pieces 1 and 2 are aphyric basalt, the remaining pieces are sparsely to moderately phyric.

Core Photo



187-1157A-4R-1

UNIT 1: APHYRIC TO MODERATELY PLAGIOCLASE OLIVINE PHYRIC BASALT

PIECES 1-11

INTERNAL CONTACTS: A small remnant of an altered glassy rind recovered on Piece 8.

	Abundance %	Size (mm)		Shape
		avg.	max. min.	
Plagioclase	4	2	3 <1	prismatic
Olivine	2	1	1.5 <1	equant
Total	6			

GROUNDMASS: Fine-grained

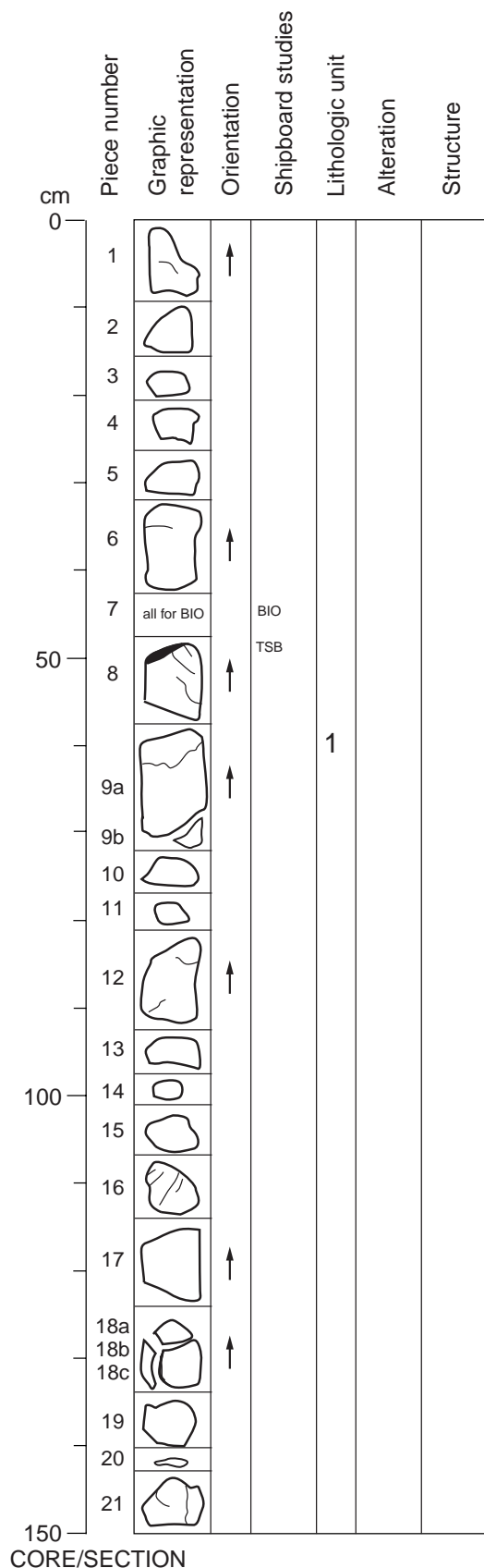
COLOR: Medium gray

ALTERATION: Overall the section is slightly to moderately altered; Piece 1 is highly altered. Highly oxidized rounded outer margins with coalescing patches of Mn oxide occur on the majority of pieces, appearing clayey on Piece 2. Clusters of pink zeolite(?) and Mn oxide occur on Piece 2. In aphyric clasts, Fe oxyhydroxide is present in the groundmass. Calcite is present in the groundmass of Pieces 3, 8, 9, 10, and 11, and a patchy replacement of groundmass by a mixture of Fe oxyhydroxides and clay occurs in Pieces 7 and 11.

STRUCTURE: Not distinguishable

ADDITIONAL COMMENTS: Note that the phenocryst description applies only to the moderately phyric basalt and is not an average throughout the section. All pieces, except Pieces 1 and 4, are aphyric. The aphyric basalt contains rare olivine phenocrysts (<1%) of which ~60% are replaced by Fe oxyhydroxide. Piece 2 consists of carbonate sediment enclosing clasts of palagonite. In the moderately phyric basalt, glomerocrysts of plagioclase and olivine up to 5 mm across occur in Piece 1. Plagioclase is seriate, and larger phenocrysts are rounded.

Core Photo



187-1157B-2R-1

UNIT 1: MODERATELY PLAGIOCLASE-OLIVINE PHYRIC BASALT

PIECES 1-21

INTERNAL CONTACTS: Chilled margins were recovered on Pieces 8, 12, 13, and 21. For oriented Pieces 8 and 12, the glass is located on the top and bottom of the pieces, respectively. Given the similarity of the material in between, this may represent recovery of both margins of a single pillow. On Piece 8, the chilled margin consists of 2 mm of palagonite, 6 mm of clear glass plus phenocrysts of both olivine and plagioclase and a 2-3 mm wide zone of coalesced spherulites. The rind on Piece 12 (2 mm wide) consists of a mixture of palagonite and clear glass. Piece 21 has 3 mm zone of glass plus phenocrysts, but the zone of coalesced spherulites is thin and grades quickly into the quenched interior; the spherulites in it are also unusually small. Piece 13 has no clear glass, only coalesced spherulites.

PHENOCRYSTS:

	Abundance %	Size (mm)		Shape	
		avg.	max.	min.	
Plagioclase	2-4	2	6	1	prismatic
Olivine	1-2	1	3	<0.5	equant
Total	3-6				

GROUNDMASS: Microcrystalline to fine-grained

COLOR: Tan-brown to medium grey (the latter in the less altered areas).

VESICLES: Piece 2 has several irregular shaped cavities (~1 mm wide) that are probably unfilled vugs; these form ~2% of the rock volume. Piece 3 has <1% irregular-shaped vesicles (0.3 to 1 mm in diameter).

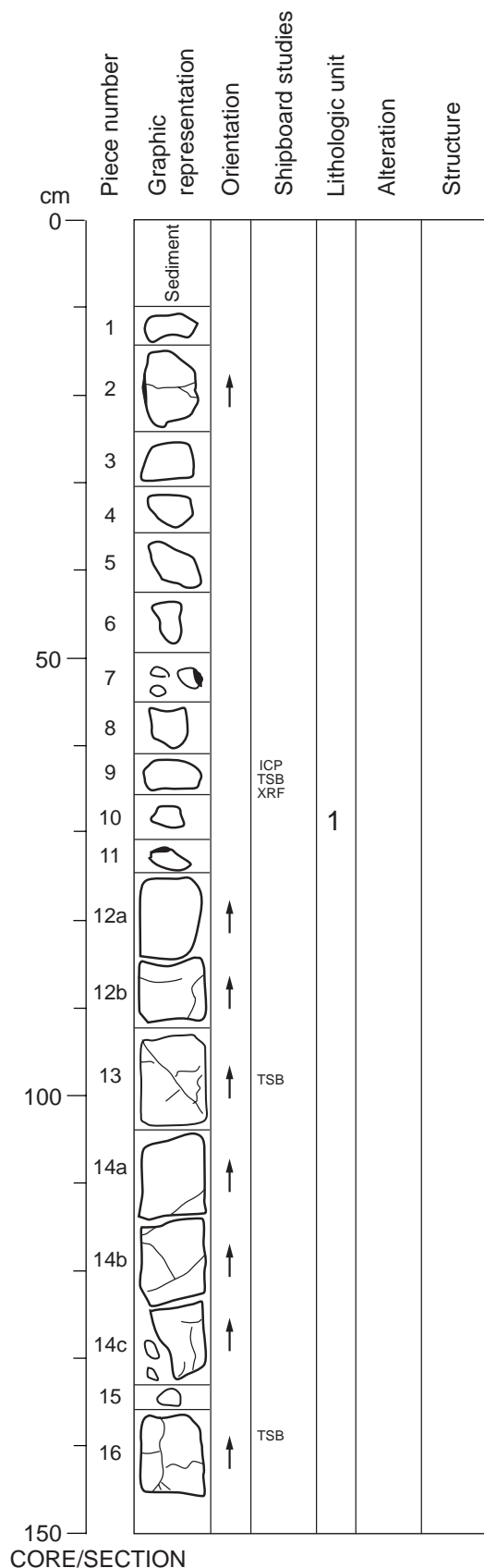
VEINS/FRACTURES: Unfilled fractures occur in Pieces 9a, 16 and 18; radial fractures crosscut the chilled margin of Piece 8.

ALTERATION: Overall the section is slightly to moderately altered (~10%-30%), but Piece 13 is highly altered. Alteration is concentrated in 1 to 2 cm wide alteration zones that are either adjacent to internal fractures, fracture surfaces now forming the outside of the pieces or next to weathered rims. Olivine is 100% altered to Fe oxyhydroxide in the alteration halos; elsewhere, olivine is 0%-40% altered to either Fe oxyhydroxides or a white clay. Plagioclase is unaltered throughout. Groundmass shows patchy alteration, mesostasis between microlites in groundmass are altered to yellow-brown clay and/or olive green smectite. Most pieces have retained portions of weathered outer surfaces (buff brown in color). On Pieces 2, 3, 12, and 17 to 21 there are thin fragments of carbonate sediment + spots of Mn oxide; the Mn oxide on Piece 20 is dendritic and the sediment of Piece 18 includes small (<0.5 mm) fragments of palagonite.

STRUCTURE: Pillow lavas

ADDITIONAL COMMENTS: Plagioclase and plagioclase + olivine clusters are common throughout. Larger plagioclase phenocrysts tend to have sieve textures indicative of partial resorption; some contain spinel inclusions (e.g., Pieces 9 and 19). Phenocryst content varies slightly throughout the section. Pieces 1 to 6 and 13 - 21 tend to have slightly less plagioclase (1-2%) and the crystals are smaller (1-3 mm) than Pieces 8 to 12 (~4% and 2-5 mm, respectively).

Core Photo



187-1157B-3R-1

UNIT 1: SPARSELY TO MODERATELY PLAGIOCLASE-OLIVINE PHYRIC BASALT

PIECES 1-16

INTERNAL CONTACTS: Chilled margins were recovered on Pieces 2, 11 and one small pebble in Piece 7; no clear glass was recovered on Pieces 2 or 11, but Piece 7 has ~3-4 mm of clear glass and phenocrysts, and palagonitization is minimal. Piece 2 consists of a thin palagonite layer, followed by the coalesced spherulite zone (~4 mm wide); there is some palagonitization of glass in between the spherulites; the chilled margin is curved, forming one side of the piece. Piece 11 consists of just the coalesced spherulite zone.

	Abundance %	Size (mm)			Shape
		avg.	max.	min.	
Plagioclase	1-4	2	6	1	prismatic
Olivine	1-2	1	3	<0.5	equant
Total	2-6				

GROUNDMASS: Microcrystalline to fine-grained

COLOR: Tan-brown to medium grey (the latter in the less altered areas).

VESICLES: Small (<0.3 mm) round vesicles occur in Pieces 4 and 10, and constitute <1% of the rock

VEINS/FRACTURES: Unfilled fractures occur in Pieces 2, 12, 13 and 14b.

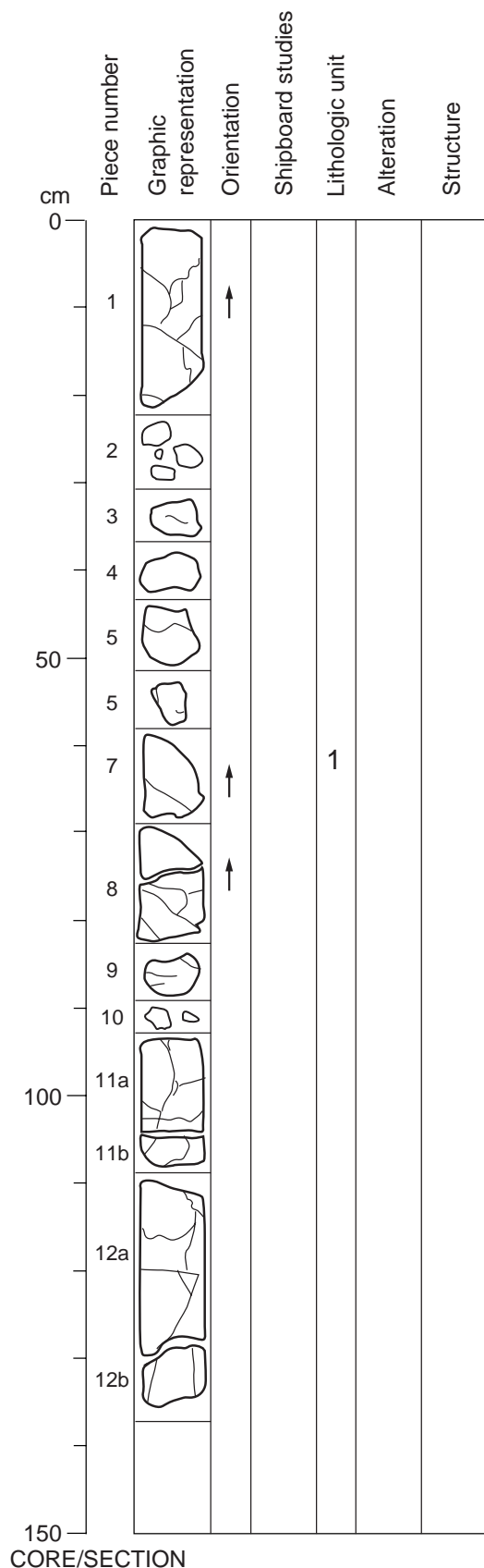
Pieces 13 and 16 have veins (3 - 5 mm wide) filled with light grayish brown carbonate sediment + Mn oxide. On one corner of Piece 13, the sediment includes small fragments of palagonite; most are less than 1 mm in size, but one fragment is up to 4 mm long. The vein is a darker grayish brown at the center than at the sides, although both materials are micritic calcite. Small segments of the boundary with the host basalt are strongly Fe-stained. The vein in Piece 16 is similar to that in Piece 13, but contains ~5% palagonite clasts. Piece 14 has a thin calcite vein < 1 mm wide. In general the veins are irregular, having neither straight sides nor sharp boundaries with the host basalt. Adjacent to the veins are wide (up to 2 cm) alteration halos .

ALTERATION: Overall the section is moderately altered (~10%-40%), but Piece 5 is highly altered. Alteration is concentrated in 1 to 2 cm wide alteration zones that are either adjacent to internal fractures, fracture surfaces that now form the outside of a piece or next to weathered rims. Olivine is 100% altered to Fe oxyhydroxide in the alteration halos; elsewhere, olivine is 0-40% altered to either Fe oxyhydroxides and/or white clay. Plagioclase is unaltered throughout. Groundmass shows patchy alteration; mesostasis between microlites in groundmass are altered to yellow-brown clay and/or olive green smectite in most pieces. Pieces 2, 3, 9, and 13 have retained portions of weathered surfaces (buff brown in color). Mn oxide occurs as small round patches (~1 mm in diameter), predominantly on fracture surfaces and within veins.

STRUCTURE: The curved shape of the chilled margin of Piece 2 suggests that at least some of these fragments are pillow lavas.

ADDITIONAL COMMENTS: Brown mud (~10 cm) was recovered at the top of this section; the material is not believed to be in situ and probably fell in from the top of the hole. Plagioclase and plagioclase + olivine clusters are common throughout. Larger plagioclase phenocrysts tend to have sieve textures indicative of partial resorption. A large olivine in Piece 6 contains a spinel inclusion. Phenocryst content varies slightly within the section. Pieces 10 and 11 are virtually aphyric and Pieces 12-16 have up to 4% plagioclase phenocrysts; the rest of the pieces are intermediate in phenocryst content.

Core Photo



187-1157B-3R-2

UNIT 1: SPARSELY TO MODERATELY PLAGIOCLASE-OLIVINE PHYRIC BASALT

PIECES 1-16

INTERNAL CONTACTS: Chilled margins were recovered on two clasts of Piece 2, Piece 9 and as two highly altered fragments of Piece 10. Piece 9 consists of 1 mm of palagonite with 2-3 mm of clear glass plus phenocrysts and a small coalesced spherulite zone. The fragments in Pieces 2 and 10 are highly altered mixtures of palagonite; less than 10% is clear unaltered glass. One of the pieces in Piece 10 has an Fe-stained clay vein parallel to the palagonite. Piece 10 (working half) consists of several glass plus palagonite fragments embedded in buff clay sediment.

PHENOCRYSTS:

	Abundance %	Size (mm)			Shape
		avg.	max.	min.	
Plagioclase	2-4	2	6	1	tabular
Olivine	1-2	1	3	1	equant
Total	3-6				

GROUNDMASS: Microcrystalline to fine-grained

COLOR: Tan-brown to medium grey (the latter in the less altered areas).

VESICLES: Small (<0.3 mm) round vesicles occur in Pieces 1, 3 and 4, and constitute <1% of the rock. In Pieces 1 and 3 the vesicles are unfilled; in Piece 4 they are filled with smectite.

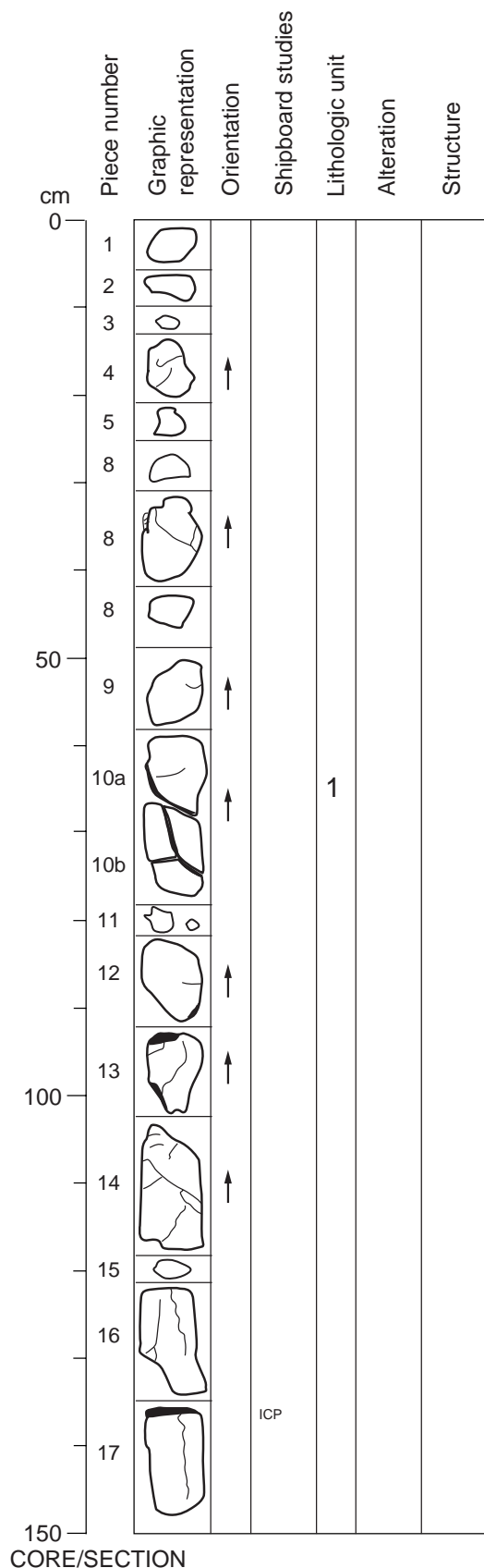
VEINS/FRACTURES: Unfilled fractures occur in Pieces 1, 6, 7, and 8. Pieces 9, 11 and 12 have complex, anastomosing vein systems. The veins form a box-work structure with wide alteration halos (1-2 cm). The veins consist of some combination of 3 materials: a pale buff colored micrite (+ clay?), a darker grayish brown micrite and a sparry calcite. The timing of origin of the two micrites is unclear, but both are cut by the sparry calcite. The veins are not straight, and the boundaries with the adjacent basalt are diffuse. In most cases, thicker veins are made predominantly of the darker grayish brown micrite and the pale buff material occurs largely at the sides of the veins. Piece 12 has a network of veins that are predominantly carbonate, but one thin branch near the bottom of the piece is clay (no reaction in 10% HCl).

ALTERATION: Overall the section is moderately altered (~10%-40%). Alteration is concentrated in 1 to 2 cm wide alteration zones that are either adjacent to internal fractures, fracture surfaces that now form the outside of a piece or next to weathered rims. Olivine is 100% altered to Fe oxyhydroxide in the alteration halos; elsewhere, olivine is <30% altered to either Fe oxyhydroxides and/or white clay. Plagioclase is unaltered throughout. The groundmass shows patchy alteration; mesostasis between microlites in groundmass is altered to yellow-brown clay plus Fe oxyhydroxides and/or olive green smectite in most pieces. Mn oxide occurs as small round patches (~1 mm in diameter), predominantly on fracture surfaces and within veins, generally associated with calcareous material. A thin layer of blue cryptocrystalline silica occurs on one of the pebbles grouped together as Piece 2.

STRUCTURE: Not distinguishable

ADDITIONAL COMMENTS: Plagioclase and plagioclase + olivine clusters are common in most pieces. Larger plagioclase phenocrysts tend to have sieve textures, indicative of partial resorption. Phenocryst content varies slightly within the section. Piece 3 is virtually aphyric, Pieces 2, 4, 5, and 6 have 1%-2% plagioclase, whereas Pieces 1, 7, 8, 11, and 12 have about 4% plagioclase.

Core Photo



187-1157B-4R-1

UNIT 1: MODERATELY PLAGIOCLASE-OLIVINE PHYRIC BASALT

PIECES 1-16

INTERNAL CONTACTS: Chilled margins were recovered on Pieces 1, 10, 13 and 17. The fragment on Piece 1 is small and consists of less than 3 mm of clear glass (minimal palagonite). Piece 10 includes ~6 mm of clear glass (working half) and 4 mm of coalesced spherulites, with little palagonite. The glassy margin of Pieces 13 and 17 include thin clay + Mn oxide layers on top of ~8-9 mm of clear glass + phenocrysts; the coalesced spherulite zones are slightly narrow (~2 mm). In the working half, Piece 13 has a thick layer of carbonate + clay + Mn oxide sediment attached to attached

PHENOCRYSTS:

	Abundance %	Size (mm)			Shape
		avg.	max.	min.	
Plagioclase	2-4	2	7	1	prismatic
Olivine	1-2	1	2.5	1	equant
Total	3-6				

GROUNDMASS: Microcrystalline to fine-grained

COLOR: Tan-brown to medium grey (the latter in the less altered areas).

VESICLES: Small (<0.3 mm), round, unfilled vesicles occur in Pieces 11.

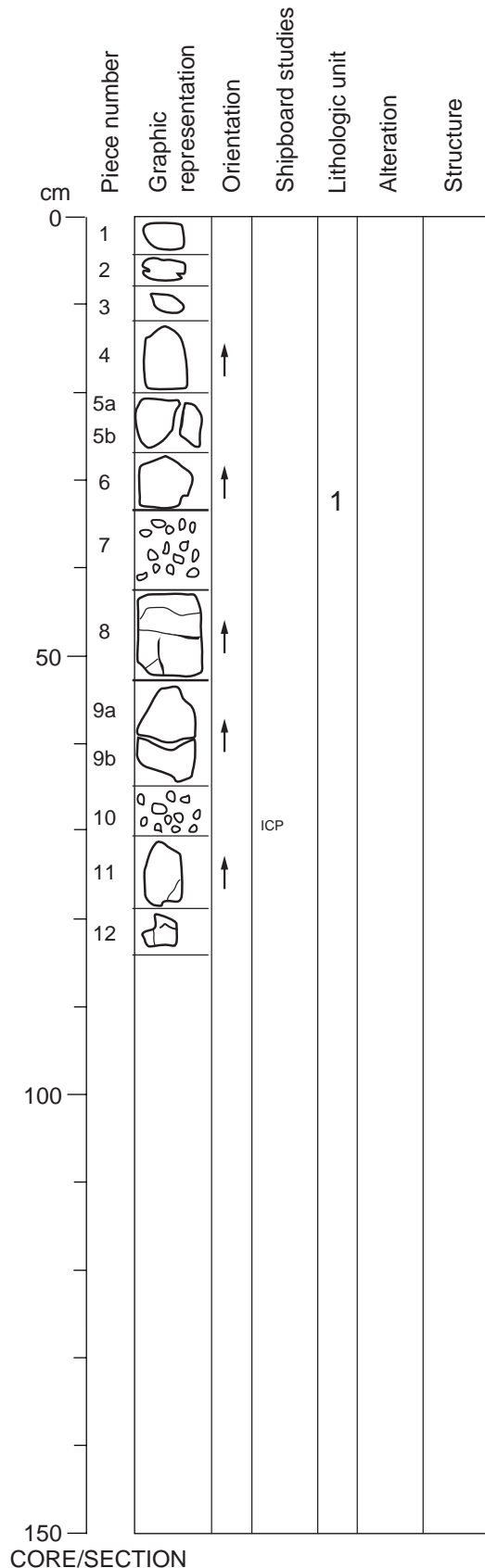
VEINS/FRACTURES: Unfilled fractures occur in Pieces 13, 14, 16 and 17; a fracture in Piece 10 is lined with Mn oxide. Piece 10 has a box-work calcite vein system with adjacent alteration halos ~1 cm wide. Vugs on the outside of Piece 15 are filled with blue cryptocrystalline silica and/or small euhedral quartz crystals.

ALTERATION: Overall the section is moderately altered (~20%-40%). Alteration is concentrated in 1 to 2 cm wide alteration zones that are either adjacent to internal fractures, fracture surfaces that now form the outside of a piece or next to weathered rims. Olivine is 100% altered to Fe oxyhydroxide in the alteration halos; elsewhere, olivine ranges from fresh (e.g., Pieces 11 and 16) to 100% altered to either Fe oxyhydroxides and/or white to yellow clay (e.g., Piece 6). Plagioclase is unaltered throughout. Groundmass shows patchy alteration; mesostasis between microlites in groundmass is altered to yellow-brown clay plus Fe oxyhydroxides and/or olive green smectite in most pieces. In Piece 14, the groundmass smectite is pervasive. Mn oxide occurs as small round patches (~1 mm in diameter), predominantly on fracture surfaces and within veins, generally associated with calcareous material. The bottom of Piece 13 has the remnants of a composite vein consisting of buff colored clay, micritic calcite and some sparry calcite; the clay tends to occur adjacent to the basalt. A thin layer of blue cryptocrystalline silica occurs on one of the glassy surfaces of Piece 10 along with a patch of drusy quartz. Pieces 8 and 9 have small patches of sediment (<2 mm thick) attached to their outer surfaces.

STRUCTURE: Indeterminant

ADDITIONAL COMMENTS: Plagioclase and plagioclase + olivine clusters are common in most pieces. In Piece 12, one of the plagioclase + olivine clusters also includes clinopyroxene. In most cases, the clusters are made up of the smaller plagioclase and olivine crystals, and most olivine occurs as smaller (~1 mm) crystals throughout. Larger plagioclase phenocrysts tend to have complicated sieve textures, indicative of partial resorption. Phenocryst content varies slightly within the section. In Pieces 1 to 6 plagioclase is slightly less abundant than in Pieces 7 to 17.

Core Photo



187-1157B-4R-2

UNIT 1: MODERATELY PLAGIOCLASE-OLIVINE PHYRIC BASALT

PIECES 1-12

INTERNAL CONTACTS: No chilled margins occur in this section, but small (<1 cm) glass fragments associated with clay and palagonite occur among the pebbles grouped into Piece 10. A chilled margin was recovered on part of Piece 10 (working half).

	Abundance %	Size (mm)			Shape
		avg.	max.	min.	
Plagioclase	2-5	2	4	0.5	prismatic
Olivine	2-3	1	2	0.5	equant
Total	4-8				

GROUNDMASS: Fine-grained to microcrystalline

COLOR: Medium gray

VESICLES: Small vesicles (<0.5 mm) are unfilled in most pieces; Pieces 4 and 12 have vesicles filled with blue cryptocrystalline silica.

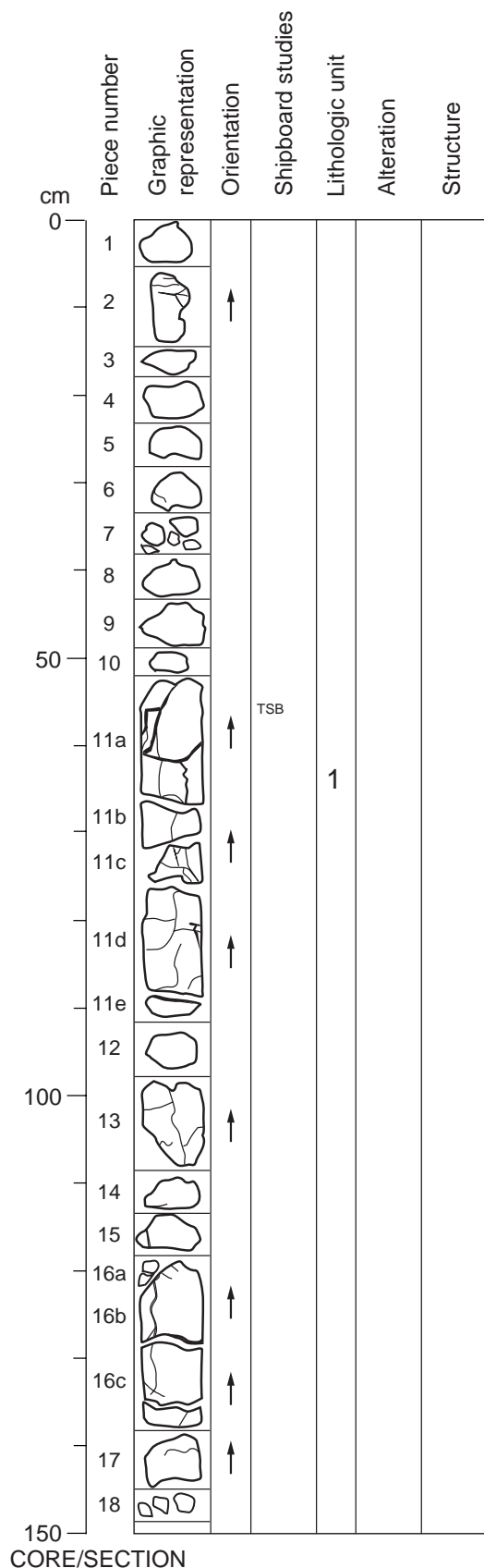
VEINS/FRACTURES: Micritic calcite and pinkish-white clays plus Mn oxide occur in veins in Pieces 4, 5, and 8 and along fracture surfaces in Pieces 3 and 10. Piece 5 is broken along such a vein; a sparry calcite vein also cuts a clay vein with Mn oxide grains in this sample. Vein thickness ranges from 0.5 to 10 mm.

ALTERATION: The section is slightly to moderately altered (5%-20%); alteration is more intense along weathered margins (Pieces 1, 4, 6, 9, 11, and 12, ranging from 0.4-1 cm wide), and in oxidation halos (0.5-1 cm) around fractures and veins. In these areas olivine is often replaced by Fe oxyhydroxide and/or green yellow clay where alteration is less intense. Olivine alteration is variable, ranging from fresh to 100% altered in oxidation halos.

STRUCTURE: Indeterminant

ADDITIONAL COMMENTS: Olivine and plagioclase clusters are common. Pieces 10 and 11 present a seriate arrangement for plagioclases.

Core Photo



187-1157B-5R-1

UNIT 1: MODERATELY PLAGIOCLASE-OLIVINE PHYRIC BASALT

PIECES 1-18

INTERNAL CONTACTS: Chilled and/or glassy margins occur on Pieces 2 (working half only), 12, 13, 14, 15, 16b, and 18. Thin layers of clear glass (<1-2 mm) occur on the tops of Pieces 16b and 18, and on the sides of Pieces 13, 14, and 15. Palagonite ± clay veins occurs on Pieces 12, 14, 15, and 16. Spherulites tend to be small in size.

PHENOCRYSTS:

	Abundance %	Size (mm)		Shape
		avg.	max. min.	
Plagioclase	4	2	6 <1	prismatic
Olivine	2	<1	4 <1	euhedral
Total	6			

GROUNDMASS: Fine-grained

COLOR: Medium gray

VESICLES: Rare vesicles (<<0.5%) are unfilled

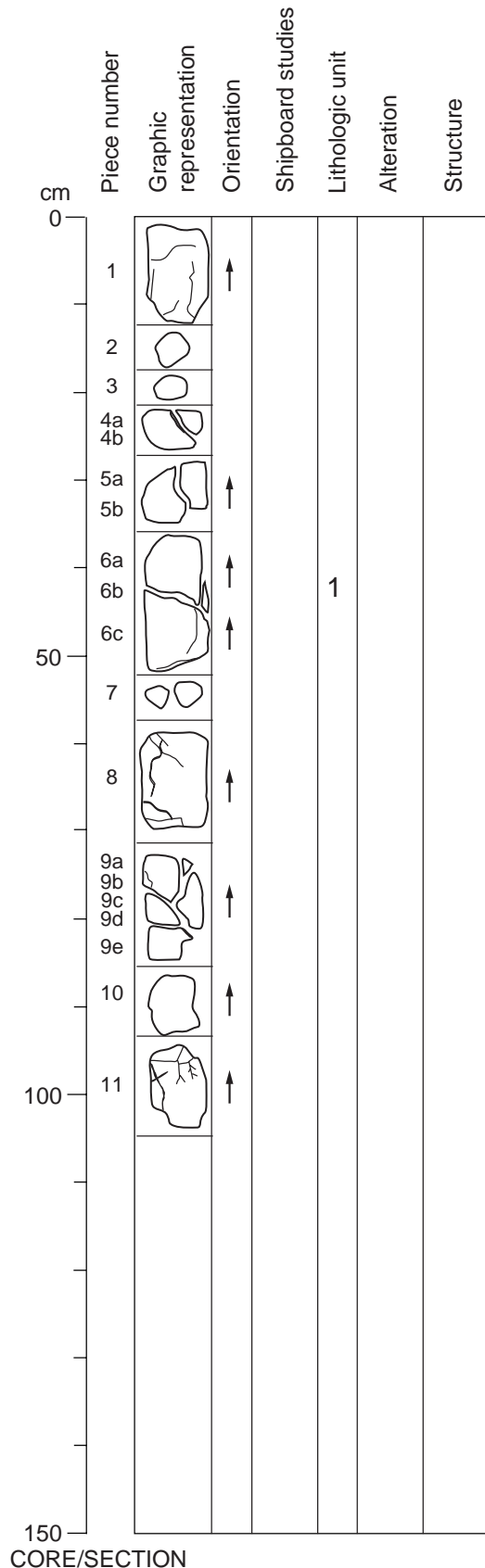
VEINS/FRACTURES: Piece 11 shows three stages of vein evolution. A cream to pink colored micritic calcite (slight reaction with 10% HCl) has Mn oxide dendrites growing down into it from the vein wall. This is followed by a pale pinkish brown very finely crystalline sparry calcite that contains Mn oxide concretions (~10%, but locally up to 40%). Cream to green waxy clay clasts (replacement after olivine) and some highly altered palagonite fragments occur within this fill. Thin sparry calcite veins meander across the other two vein materials and crosscut the host basalt; the micritic calcite and very finely crystalline sparry calcite are associated within the same vein. Total vein width reaches a maximum of 25 mm, but may be as thin as 4 mm. The veins form 2 main interconnecting sets which tend to be sub-vertical. There are ~25 mm wide alteration halos associated with the veins. Fractures and/or very thin clay ± Mn oxide veins are also found in Pieces 2, 13 and 16c. A thin Fe-stained clay vein occurs in part of Piece 11a. Thick clay veins (1-4 mm) occur on Pieces 12, 14, 15 (working half only), and 18 (working half only); on Pieces 15 and 18 these are associated with the glassy margins.

ALTERATION: Overall alteration is slight to moderate and is generally confined to the weathered outer surfaces of pieces (e.g., Piece 1) or to alteration halos (usually 1-2 cm wide) around veins. Pieces 11, 16, and 17 are the most altered. Only in Piece 8 there is a significant proportion of olivine replaced by green yellow clay (~40%); in the remaining pieces, >80% of olivine is fresh. The outer surfaces of most pieces are coated with pinkish white sediment and Mn oxide spots, dendrites, and/or patches (e.g., Piece 1); in many cases, these surfaces appear to be broken veins.

STRUCTURE: Pillow lavas

ADDITIONAL COMMENTS: Glomerocrysts of plagioclase and olivine comprise ~10%-15% of the phenocrysts and range from 2 to 8 mm. Some of the larger plagioclase phenocrysts are rounded and are sieve-textured (e.g., a 6 mm phenocryst in Piece 13). Plagioclase is flow banded parallel to the chilled margin on the side of Piece 13. Olivine is generally fresh and contains Cr-spinel (e.g., Piece 11d).

Core Photo



187-1157B-5R-2

UNIT 1: MODERATELY PLAGIOCLASE-OLIVINE PHYRIC BASALT

PIECES 1-11

INTERNAL CONTACTS: Chilled margins are present on Pieces 5b, 6a, 10, and 11. The glass is on the top of oriented Pieces 6 and 11 and consist of 1-2 mm of palagonite + clay followed by ~2 mm of clear glass + phenocrysts; the spherulites in the coalesced spherulite zone tend to be small. The chilled margin occurs on the side of Piece 10 and includes 1-2 mm of clear glass (no palagonite). The chilled margin occurs on the bottom of Piece 5b and consists of 1-2 mm of palagonite followed by 4-5 mm of glass plus phenocrysts (i.e. no clear glass).

	Abundance %	Size (mm)			Shape
		avg.	max.	min.	
Plagioclase	2-3	1.5	4	<1	lath-like to prismatic
Olivine	~1	1	2	<1	subhedral
Total	3-4				

GROUNDMASS: Microcrystalline

COLOR: Medium gray

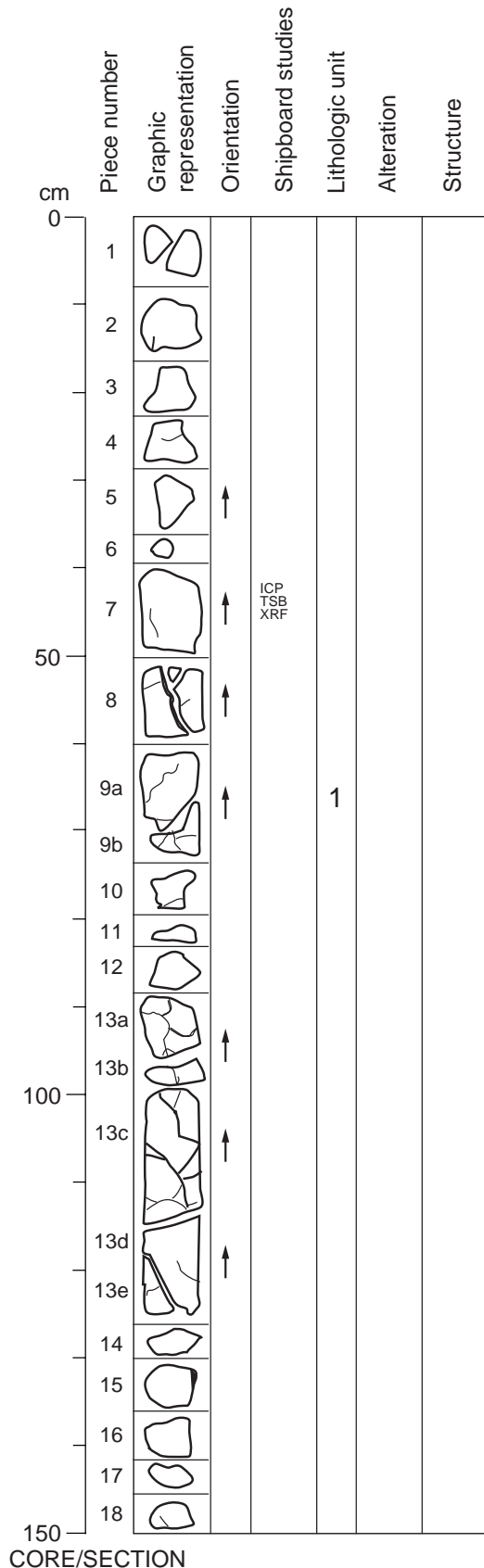
VEINS/FRACTURES: Open fractures occur in Pieces 1, 8, 9a, and 11. Veins are filled with micritic calcite followed by sparry calcite; Piece 11 has a vein 1-1.5 mm wide. Pieces 4, 6, and 8 (working half only) are bounded by broken vein surfaces. These surfaces are coated with calcite and clay with Mn oxide spots ~1 mm in diameter.

ALTERATION: Pieces 6, 7, 8, and 11 have alteration halos parallel to their outer surfaces or adjacent to veins. These margins extend between 0.5 and 1 cm into the interior of the piece and constitute between 20 and 40% of the sample.

STRUCTURE: Pillow lavas

OTHER COMMENTS: Clusters of plagioclase and plagioclase plus olivine occur, but these tend to be composed of smaller phenocrysts. Sieve-textured plagioclase is also present, but appears to be less abundant than in some previous sections.

Core Photo



187-1157B-6R-1

UNIT 1: MODERATELY PLAGIOCLASE-OLIVINE PHYRIC BASALT

PIECES 1-18

INTERNAL CONTACTS: A glassy rind consisting of a mixture of palagonite plus glass is present on Piece 1 (1 mm thick). Piece 15 has a 4 mm wide chilled margin, with no clear glass, only quench spherulitic texture.

PHENOCRYSTS:

	Abundance %	avg. Size (mm)	max. Size (mm)	min. Size (mm)	Shape
Plagioclase	3-4	2	8	<1	prismatic
Olivine	1-2	1	5	<1	equant
Total	4-6				

GROUNDMASS: Microcrystalline to fine-grained

COLOR: Medium gray

VESICLES:

	Abundance %	avg. Size (mm)	max. Size (mm)	min. Size (mm)	Shape
	<1	1	1.5	<0.5	round

Filling: Unfilled

VEINS/FRACTURES: Piece 8 has small (<0.5 mm wide) fractures that extend from the outer margin into the piece. Veins occur in Pieces 8, 9b, 13a, 13b and 13c. They are generally 1 mm wide and are filled with a combination of white sparry calcite and pink to tan micritic calcite, plus associated Mn oxide spots; some thin veins (e.g., <1 mm) are clay (e.g., Piece 13). Piece 13 has a vug filled with dentate calcite.

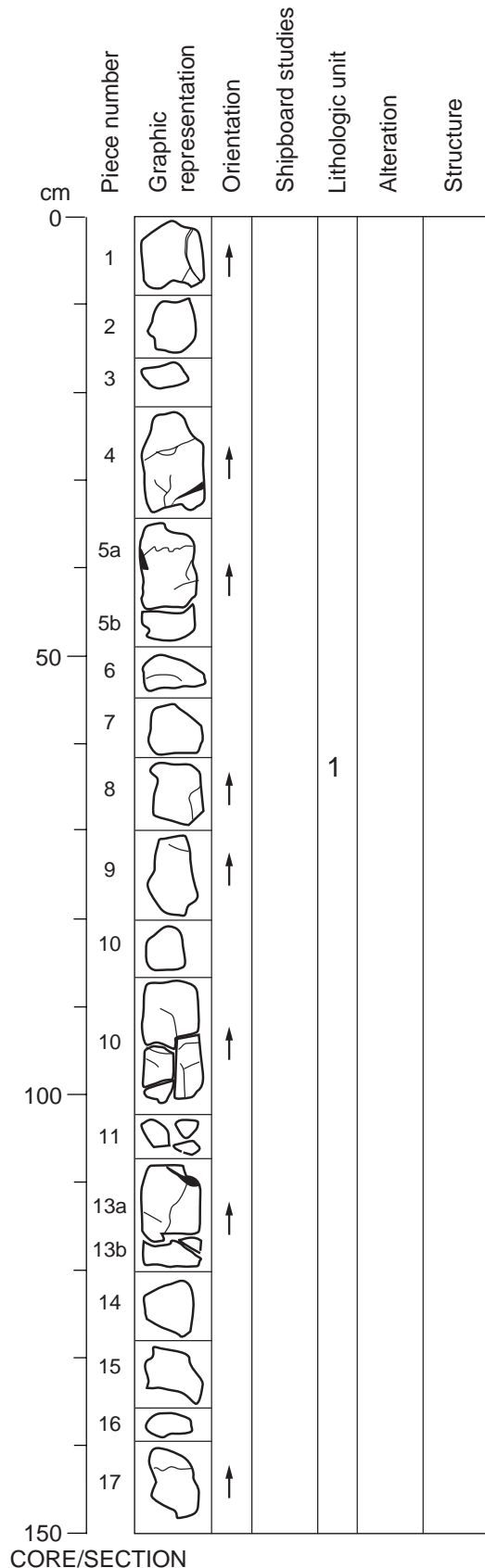
ALTERATION: All veins have a 1-2 cm wide alteration halos associated with them. Pieces 1, 2, 7, 9, 10, 15, 16, 17, and 18 have alteration halos that parallel the outer edges of the pieces; these halos range from 3 mm wide in Piece 7 to 1 cm wide in Piece 1. Pieces 6, 11, 12, 14, and 18 are pebble-to cobble-sized pieces with weathered, not cored, outer surfaces. Overall the section is slightly to moderately altered.

STRUCTURE: None

ADDITIONAL COMMENTS: Cr-spinel in an olivine phenocryst in Piece 7.

Clusters of plagioclase and plagioclase + olivine occur throughout and some large plagioclase phenocrysts show sieve texture.

Core Photo



187-1157B-6R-2

UNIT 1: MODERATELY PLAGIOCLASE-OLIVINE PHYRIC BASALT

PIECES 1-17

INTERNAL CONTACTS: Glassy rinds occur on Pieces 5a (top) and 13b (bottom). Clear glass is thin (<1 mm) and mixed with palagonite in Piece 13; no clear glass was recovered on Piece 5, only a chilled margin starting at the coalesced spherulite zone.

	Abundance %	Size (mm)			Shape
		avg.	max.	min.	
Plagioclase	2	2	7	<1	prismatic
Olivine	1	1	3	<1	euhedral
Total	3				

GROUNDMASS: Fine-grained

COLOR: Medium gray

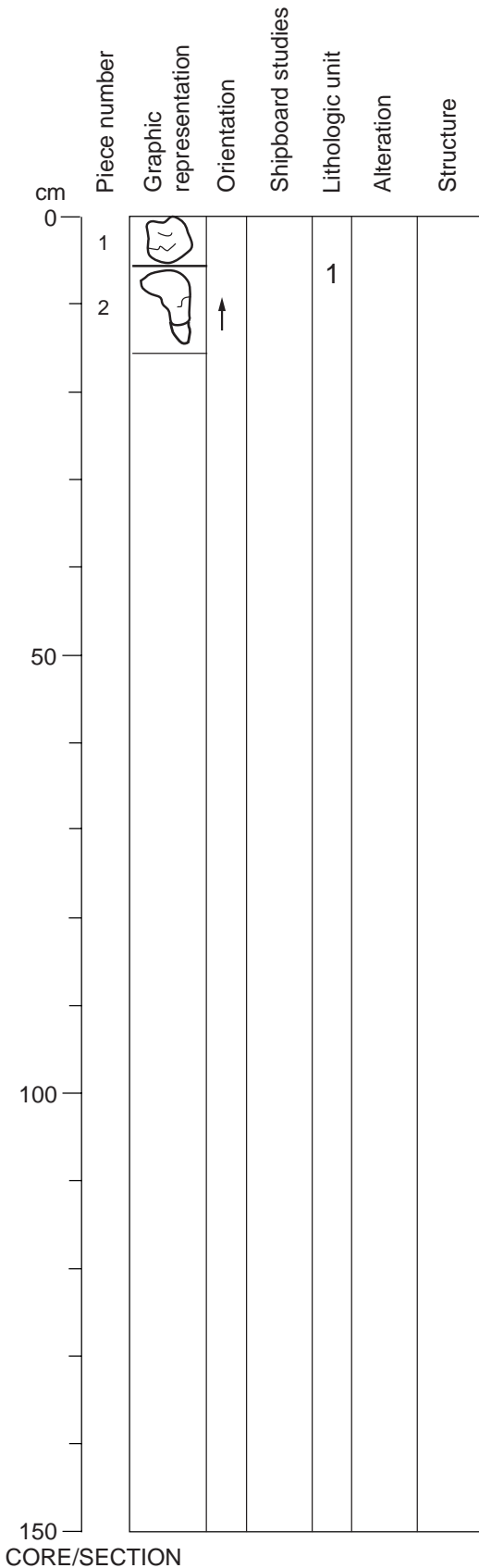
VEINS/FRACTURES: Fractures are generally lined with Mn oxide and blue cryptocrystalline silica (e.g., Pieces 6, 13a), and veins are filled with crystalline calcite (e.g., the vertical 1 mm wide vein in Piece 1). In Pieces 4 and 11 there are oblique (to vertical) veins filled with pink to white micritic calcite.

ALTERATION: Overall alteration is slight to moderate. Most alteration is restricted to weathered margins and alteration halos around veins. Weathered margins are ~5 mm on average and are found on at least one side of every piece. Alteration halos average ~5 mm across but reach ~15 mm in Piece 5a. In these areas olivine is partially replaced by Fe oxyhydroxide; green yellow clay is mainly seen in Piece 5b. The outside surfaces of many pieces (~40%) are bounded by a least one broken vein/fracture face resulting in a coating of blue cryptocrystalline silica, calcite and/or Mn oxide (e.g., Pieces 5 and 9).

STRUCTURE: not distinguishable

ADDITIONAL COMMENTS: Olivine is fresh in the majority of pieces and contains Cr-spinel, e.g., Piece 2. Pieces 7 and 8 have a felty arrangement of plagioclase in the groundmass. Some large (>4 mm) plagioclase phenocrysts are rounded and have embayed cores (e.g., a 6 mm phenocryst in Piece 13b). Plagioclase and olivine glomerocrysts comprise ~10% of the phenocrysts.

Core Photo



187-1157B-6R-3

UNIT 1: MODERATELY PLAGIOCLASE-OLIVINE PHYRIC BASALT

PIECES 1-2

INTERNAL CONTACTS: Piece 1 has a very small (~4 mm wide) wedge of mixed palagonite + glass; Piece 2 has no clear glass, only a chilled margin starting from the coalesced spherulite zone.

	Abundance %	Size (mm)			Shape
		avg.	max.	min.	
Plagioclase	2.5	2.5	4	<1	prismatic
Olivine	1	<1	1	<1	euohedral
Total	3.5				

GROUNDMASS: Fine grained

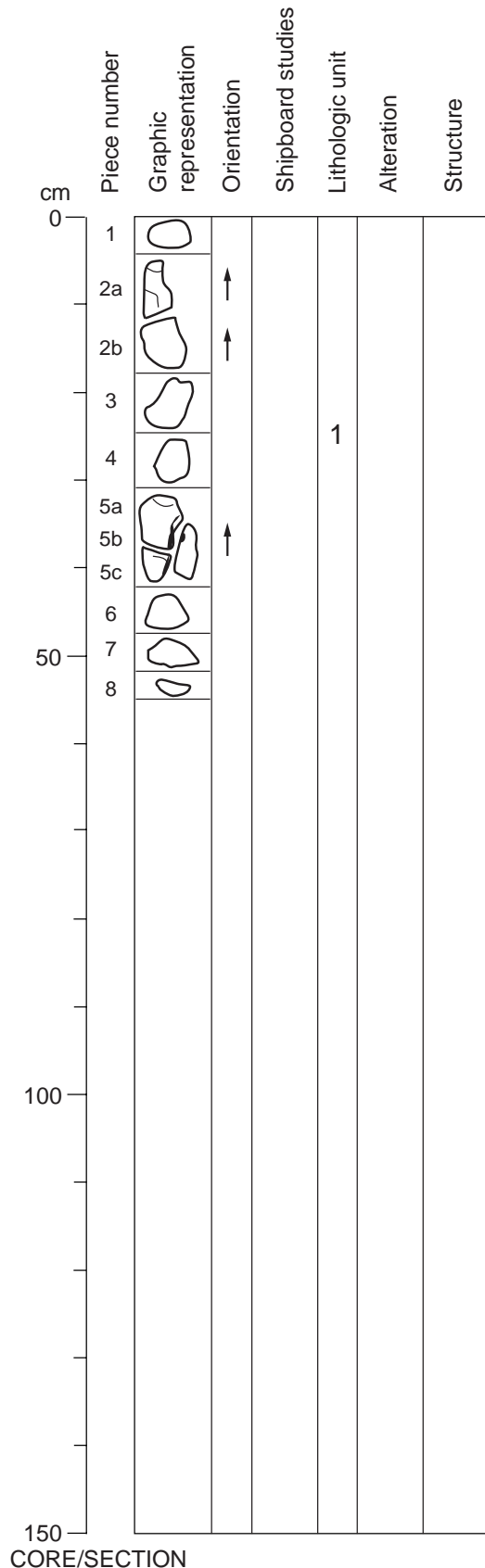
COLOR: Medium gray

VEINS/FRACTURES: A fracture in Piece 1 has a 2 mm-wide alteration halo.

ALTERATION: Blue cryptocrystalline silica and Mn oxide spots occur on the outside of Piece 2. Olivine is replaced by Fe oxyhydroxide in oxidation halos and weathered margins, the latter occurs on both pieces, and is 5 mm wide on Piece 2.

STRUCTURE: Probably pillow lavas, based on the presence of glassy rinds and the wedge (V-) shape of Piece 2.

Core Photo



187-1157B-7R-1

UNIT 1: MODERATELY PLAGIOCLASE-OLIVINE PHYRIC BASALT

PIECES 1-8

	Abundance %	Size (mm)		Shape
		avg.	max. min.	
Plagioclase	3	2	7 <1	prismatic
Olivine	1	<1	2 <1	euhedral
Total	4			

GROUNDMASS: Fine-grained to microcrystalline

COLOR: Medium gray

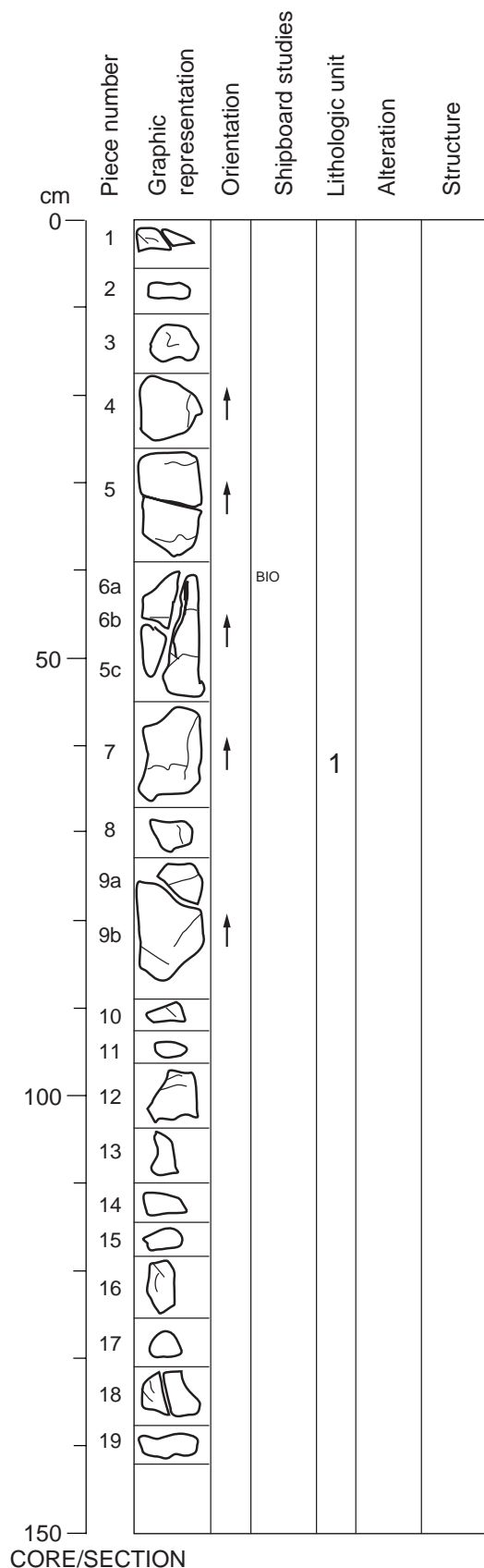
ALTERATION: Overall the section is slightly altered; Piece 5 is moderately altered. Alteration is concentrated along the margins of some pieces, and olivine is partially replaced by Fe oxyhydroxide (~30%) in these areas. Piece 5 has an alteration halo up to 2 cm wide surrounding a micritic calcite vein.

Pieces 2 and 5 are bounded by fracture and/or broken vein surfaces coated with calcite, blue cryptocrystalline silica and Mn oxide spots and dendrites. In Piece 3 cryptocrystalline blue silica is present in the groundmass in corroded areas close to glomerocrysts.

STRUCTURE: Not distinguishable because of the large number of pebble-size pieces (Pieces 1, 3, 4, 6, 7, and 8).

ADDITIONAL COMMENTS: A felty arrangement of groundmass plagioclase is common throughout this section. Plagioclase and olivine glomerocrysts comprise ~10% of the phenocrysts.

Core Photo



187-1157B-8R-1

UNIT 1: MODERATELY PLAGIOCLASE-OLIVINE PHYRIC BASALT

PIECES 1-19

INTERNAL CONTACTS: Glassy rinds occur on Pieces 5 (3 mm wide) and 11 (relict, <1 mm wide); the glass on Piece 5 is mostly unaltered. Wide chilled margins (1-3 mm) on Pieces 3 and 19 retain no clear glass.

PHENOCRYSTS:

	Abundance %	Size (mm) avg.	Size (mm) max.	Size (mm) min.	Shape
Plagioclase	3-5	1.5	4	0.5	prismatic to tabular
Olivine	1	0.8	2	0.2	equant
Total	4-6				

GROUNDMASS: Fine-grained

COLOR: Medium gray

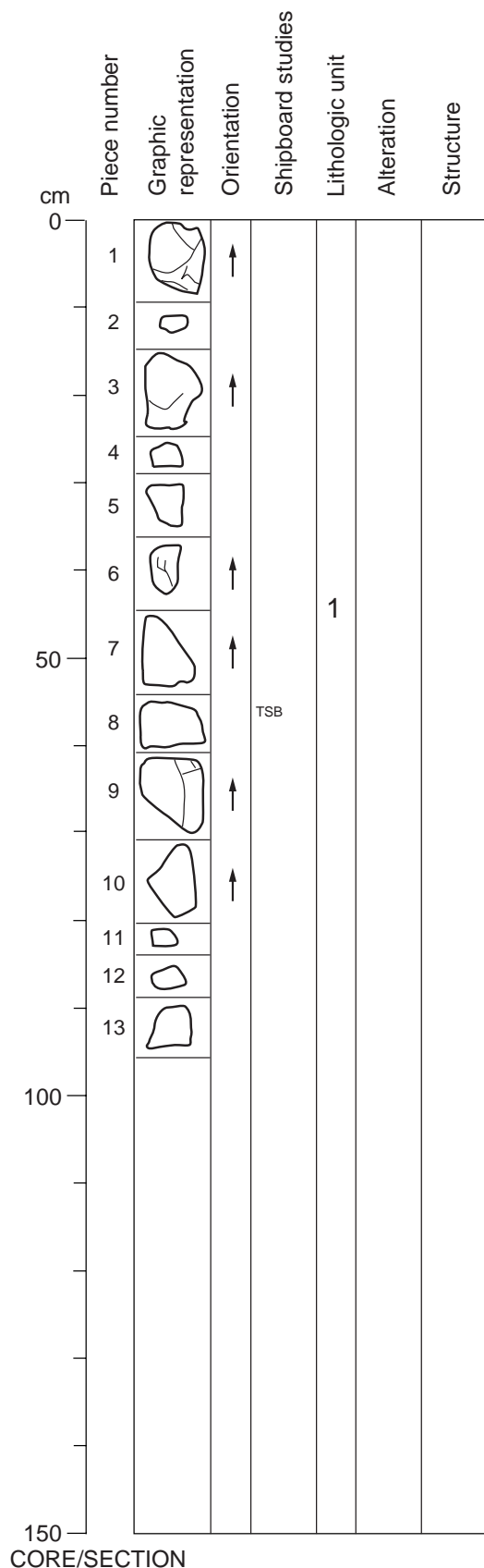
VEINS/FRACTURES: Overall the section has few fractures (2-3%). Most are open fractures < 0.2 mm, covered with Mn oxide; adjacent alteration halos are narrow (1-2 mm). Thin veins (0.1-1 mm wide) are filled with calcite in Piece 4, 5, 6, and 9 and surrounded by 0.5-1 cm wide, light-brown alteration halos. Piece 6 is broken along a calcite-filled fracture on which 1-2 mm spots of Mn oxide are visible.

ALTERATION: Overall the section is slightly to moderately altered (5-20%), with alteration occurring predominantly along weathered margins (0.1-0.5 cm) and alteration halos (0.5-1 cm) around fractures and veins. In these areas, olivine is often replaced by Fe oxyhydroxide and/or to green-yellow clay when the alteration is less extensive. In Pieces 4, 9, 12, 14, 16, and 18 groundmass alteration is more pervasive, resulting in a greenish brown patchy color. In Pieces 4 and 9 groundmass alteration forms irregular halos, unrelated to fractures or piece geometry. Groundmass alteration comprises replacement of olivine by Fe oxyhydroxide and smectite. The exterior surfaces of pieces are partly covered with thin Mn oxide patches, 0.5-1.5 cm in diameter or calcite.

STRUCTURE: Probably pillow basalts, as judged from the chilled margin on Piece 5. However, V-shaped basalt fragments are not present.

ADDITIONAL COMMENTS: Olivine and plagioclase clusters are common throughout and make 5%-10% of the phenocrysts. Phenocryst abundance is variable, ranging from 5%-6% in Piece 3 and 7%-2% in Piece 18.

Core Photo



187-1157B-8R-2

UNIT 1: SPARSELY TO MODERATELY PLAGIOCLASE-OLIVINE PHYRIC BASALT

PIECES 1-13

INTERNAL CONTACTS: Chilled margins were recovered on Pieces 12 and 13. The fragment on Piece 12 has a palagonite + white clay layer on top, followed by a 3 mm wide clear glass zone; Piece 13 has 2 mm of palagonite and 6 mm of glass plus phenocrysts.

PHENOCRYSTS:

	Abundance %	Size (mm)			Shape
		avg.	max.	min.	
Plagioclase	1-4	2	6	1	prismatic
Olivine	<1-2	1	1	1	equant
Total	2-6				

GROUNDMASS: Microcrystalline to fine grained

COLOR: Tan-brown to medium grey (the latter in the less altered areas).

VESICLES: Small (<0.3 mm), round, unfilled vesicles occur in Piece 1.

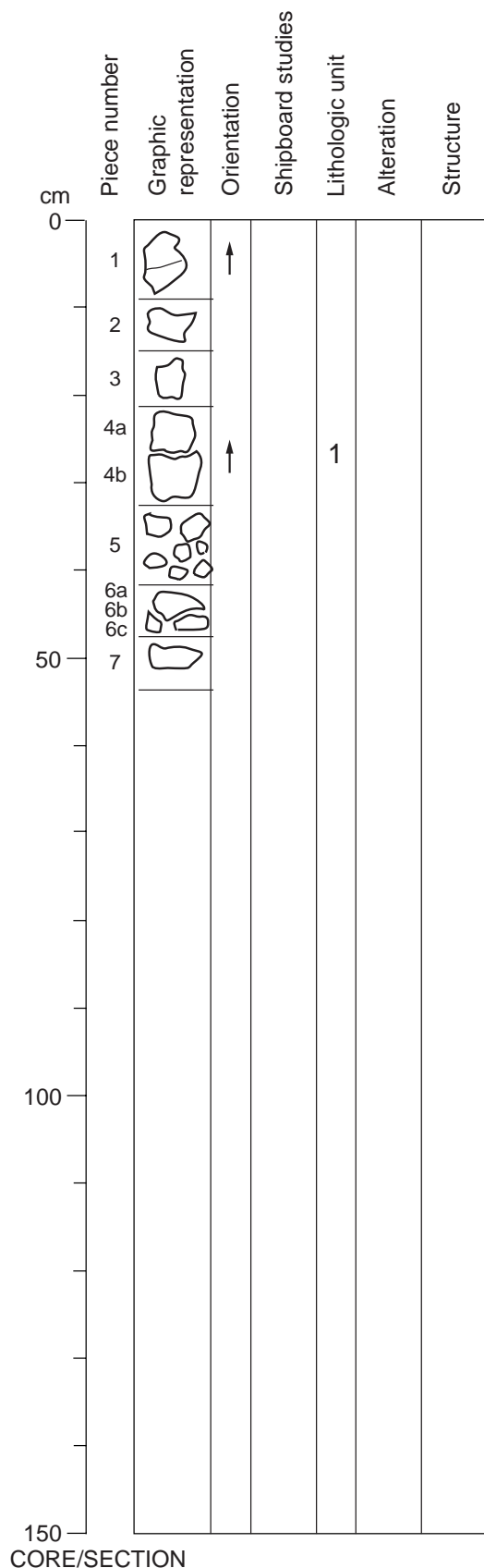
VEINS/FRACTURES: Unfilled fractures occur in Pieces 1, 3, 6, 9, and 10. Piece 1 has composite vein consisting of yellowish white clay (+ micritic calcite) with sparry calcite along one side.

ALTERATION: Overall the section is slightly to moderately altered (~10-20%). In contrast to some previous sections, the alteration tends to be patchy to pervasive replacement of groundmass mesostasis by Fe oxyhydroxides plus brown clay or to olive green smectite. There are small alteration halos (~1 mm) adjacent to fractures in Pieces 1 and 8 and a slightly larger halo (~5 mm) adjacent to the clay + calcite vein on the top of Piece 1. In some pieces olivine phenocrysts are replaced by a yellow to white clay (e.g. Pieces 3 and 7). Plagioclase is unaltered throughout. Piece 7 has a small (~1.5 cm) roughly circular alteration halo in which there is groundmass replacement by calcite as well as Fe oxyhydroxides and clay. This piece also has a thin layer of blue cryptocrystalline silica on one of the fracture surfaces that forms the outside of the piece.

STRUCTURE: Not distinguishable

ADDITIONAL COMMENTS: Plagioclase and plagioclase + olivine clusters occur, but are not as common as in previous sections. Sieve-textured plagioclase also occurs, but is not common. Phenocryst content varies slightly within the section. Piece 13 has the most abundant plagioclase (~4%), Pieces 1 to 5, 7 to 9, and 12 have 1%-2% plagioclase, whereas Pieces 6, 10 and 11 are nearly aphyric (~1% plagioclase and olivine microphenocrysts).

Core Photo



187-1157B-9R-1

UNIT 1: SPARSELY TO MODERATELY PLAGIOCLASE-OLIVINE PHYRIC BASALT

PIECES 1-7

INTERNAL CONTACTS: A chilled margin was recovered only on Piece 4; glass is only present on the working half.

	Abundance %	Size (mm)			Shape
		avg.	max.	min.	
Plagioclase	1-2	2	3	1	prismatic
Olivine	1-2	1	5	1	equant
Total	2-4				

GROUNDMASS: Microcrystalline to fine-grained

COLOR: tan-brown to medium grey (the latter in the less altered areas).

VESICLES: Small (<0.3 mm), round vesicles occur in Pieces 1, 3 and 4. In Pieces 3 and 4 they are unfilled; in Piece 1 they are lined with Fe oxyhydroxides.

VEINS/FRACTURES: Unfilled fractures occur in Pieces 1 and 4. Pieces 1 and 6 have patches of clay plus Mn oxide on outer surfaces of the core pieces. Piece 3 has a remnant of a composite vein, also on a fracture surface; the vein remnant (~1 mm thick) consists of pinkish white clay crosscut by sparry calcite.

ALTERATION: Overall the section is slightly altered (~10%). Most pieces have fresh interiors, but alteration halos are slightly to moderately altered. These alteration halos make up between 30 and 80% of the individual core pieces. The alteration halos tend to be roughly concentric, following the shape of the piece (e.g., Pieces 1 and 2). Groundmass is partially replaced by a mixture of Fe oxyhydroxides and clay in the alteration halos; in some cases, olivine is 80-100% altered to a white to yellow clay as well (e.g., Piece 6). Piece 6 has cryptocrystalline blue silica on a fracture surface.

STRUCTURE: Not distinguishable

ADDITIONAL COMMENTS: Plagioclase and plagioclase + olivine clusters occur, but are not as common as in previous sections. Sieve-textured plagioclase also occurs, but is not common.

187-1157A-2R-1, 30-33 cm (TS#34) Unit: 1 OBSERVER: Kempton
ROCK NAME: Calcarenite
WHERE SAMPLED: near top of unit
GRAIN SIZE: fine grained
TEXTURE: equigranular

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)			APPROX. COMP.	MORPHOLOGY	COMMENTS
			min.	max.	av.			

PHENOCRYSTS

Plagioclase
Olivine
Clinopyroxene

GROUNDMASS

Olivine
Plagioclase
Clinopyroxene
Opaque Minerals
Glass

SECONDARY MINERALOGY	PERCENT	PERCENT ORIGINAL	SIZE (mm)			REPLACING / FILLING	COMMENTS
			min.	max.	av.		

Clays

VESICLES/CAVITIES	PERCENT	LOCATION	SIZE (mm)			FILLING / MORPHOLOGY	COMMENTS
			min.	max.	av.		

COMMENTS : The sample is ~80% rounded to elongate calcite crystals (0.1 - 0.3 mm) poorly cemented by interstitial clay. The amount of clay increases toward one side of the thin section where it is predominant (forming 10-15% of the thin section). In this area there are numerous angular clasts of basaltic origin (~5% of the thin section). Included are a relatively unaltered shard retaining quench crystals (~1.5 mm long), numerous palagonite fragments ranging from angular shards to more rounded and completely altered amorphous shapes where they are partially replaced by calcite. Also present are angular fragments of unaltered feldspar (<0.3 mm maximum dimension). MnO nodules as large as 0.3 mm are common throughout, but most are <<0.1 mm.

187-1157A-2R-1, 44-48 cm (TS#36)			Unit: 1			OBSERVER:	Kempton	
ROCK NAME:	Moderately plagioclase-olivine phyric basalt							
WHERE SAMPLED:	piece with crosscutting fracture							
GRAIN SIZE:	microcrystalline							
TEXTURE:	immature sheaf quench texture							
PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)			APPROX. COMP.	MORPHOLOGY	COMMENTS
			min.	max.	av.			
PHENOCRYSTS								
Plagioclase	5	5	0.3	3			prismatic to blocky	Albite twinning; some discontinuous zoning; most crystals unzoned. Some sieve textures, ranges from embayed cores to embayed rims. Some Fe staining along microcracks in alteration halo around fracture.
Olivine	2	2	0.3	1.5			equant, skeletal	~10% alteration to Fe oxyhydroxides + clay in the fracture alteration halo, but elsewhere unaltered.
Clinopyroxene								
Cr spinel	tr	tr		0.15			anhedral, equant	
GROUNDMASS								
Olivine	2	2		0.3			equant	Less than 10% altered to Fe oxyhydroxides + clay.
Plagioclase	30	30		0.3			acicular to skeletal	Aspect ratio 40:1.
Clinopyroxene	2	2		<20 microns			anhedral, equant	There are some unusual clots of crystals, where clinopyroxene crystallization seems to be enhanced within the quench sheafs (enhanced by volatiles?).
Opaque Minerals	1	1		<2 microns			equant	
Glass								
Quench Mesostasis	43	58						Includes a combination of quench plagioclase, clinopyroxene, olivine and glass.
SECONDARY MINERALOGY	PERCENT	LOCATION	SIZE (mm)			REPLACING / FILLING	COMMENTS	
			min.	max.	av.			
Clays + Fe oxyhydroxides	15					replacing olivine and groundmass	There is a lot of orange-brown coloration in the groundmass of the alteration halo and it is difficult to tell whether this is all replacement by clays and/or Fe oxyhydroxides or just Fe staining; ~60 of the quench groundmass is affected by this.	
MnO	tr					lining veins		
VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)			FILLING / MORPHOLOGY	COMMENTS	
			min.	max.	av.			
Vesicles	<<1	distributed		50 microns			Unfilled.	
COMMENTS :	The alteration halo around the fracture has a Y-shape, being widest at one end of the slide (15 mm) and narrowing to 2-3 mm toward the opposite end. Over part of its length the fracture appears to have a narrow (50 micron wide) vein of colorless mineral, probably cryptocrystalline silica, growing perpendicular to the vein wall; some segments of the vein are filled with small MnO concretions and unidentified cryptocrystalline material, suggesting that the fracture is in fact a small vein. Clusters of plagioclase and olivine are present.							

187-1157A-2R-1, 86-90 cm (TS#35)			Unit: 1			OBSERVER:		Kempton	
ROCK NAME:		aphyric basalt							
WHERE SAMPLED:		cobble size piece in rubble pile							
GRAIN SIZE:		microcrystalline to cryptocrystalline							
TEXTURE:		Sheaf quench textures							
PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)			APPROX. COMP.	MORPHOLOGY	COMMENTS	
			min.	max.	av.				
PHENOCRYSTS									
Plagioclase									
Olivine	<1	<1	0.3	0.8	0.4		equant, euhedral	Microphenocrysts.	
Clinopyroxene									
GROUNDMASS									
Olivine	2	2		50 microns			equant, skeletal	In spite of some alteration of mesostasis, even groundmass olivine is largely unaltered (<5% alteration).	
Plagioclase	35	35		1			acicular, skeletal, sheaf quench textures	Acicular crystals up to 1 mm long (aspect ratio 50:1).	
Clinopyroxene	2	2		<60 microns					
Opaque Minerals	2	2		<10 microns			equant to elongate skeletal structures	~1% of these are small sulfide globules.	
Glass									
Mesostasis	37	58							
SECONDARY MINERALOGY	PERCENT	LOCATION	SIZE (mm)			REPLACING / FILLING	COMMENTS		
			min.	max.	av.				
Clays + Fe oxyhydroxides	20						replacing mesostasis	Greenish yellow-brown color.	
Calcite	1						replacing groundmass		
VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)			FILLING / MORPHOLOGY	COMMENTS		
			min.	max.	av.				
Vesicles	1	distributed		0.1			calcite / round	Most vesicles are unfilled, but a few are filled with calcite.	
COMMENTS :									
The proportion of groundmass phases cannot be accurately assessed due to the high proportion of quench crystal morphologies. The estimate for mesostasis includes a combination of quench plagioclase, clinopyroxene, olivine and glass. Maximum size of vesicles is difficult to assess due to some plucking of the slide. There are some unusual clots of crystals in this thin section, where clinopyroxene crystallization seems to be enhanced within the quench sheafs (enhanced by volatiles?). In some parts of the slide these clots are associated with calcite (replacing glass or filling voids?)									

187-1157A-3R-2, 19-22 cm (TS#38)			Unit: 2			OBSERVER:	Kempton	
ROCK NAME:	Moderately plagioclase-olivine phyric basalt							
WHERE SAMPLED:	near bottom of section							
GRAIN SIZE:	microcrystalline to cryptocrystalline							
TEXTURE:	intersertal							
PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)			APPROX. COMP.	MORPHOLOGY	COMMENTS
			min.	max.	av.			
PHENOCRYSTS								
Plagioclase	5	5	0.2	5			prismatic to equant	Plagioclase is seriate; only about 2% is phenocrysts >1 mm, the rest range from 0.2 to 1 mm in size. Sieve textured plagioclase is common, ranging from just embayed cores to just embayed rims. All plagioclase shows albite twinning; one crystal shows Carlsbad(?) twins; discontinuous zoning common; most unzoned. Some Fe staining along microcracks.
Olivine	3	3	0.1	2			equant to skeletal	
Clinopyroxene Cr spinel	tr	tr		0.1			equant, anhedral	
GROUNDMASS								
Olivine	2	2		0.1			equant	Aspect ratio ~20:1.
Plagioclase	30	30		0.5			acicular to skeletal quench morphologies to anhedral granules	
Clinopyroxene							equant	
Opaque Minerals Glass Mesostasis	2 47	2 57		<2 microns				
SECONDARY MINERALOGY								
MINERALOGY	PERCENT	LOCATION	SIZE (mm)			REPLACING / FILLING	COMMENTS	
			min.	max.	av.			
Clays + Fe oxyhydroxides	7						There is a lot of orange-brown coloration in the groundmass and it is difficult to tell whether this is all replacement by clays and/or Fe oxyhydroxides or just Fe staining. Occurs as equant to skeletal crystals in the groundmass associated with calcite.	
Hematite	tr			0.1				
Calcite	3					filling vesicles, replacing groundmass		
VESICLES/CAVITIES								
VESICLES/CAVITIES	PERCENT	LOCATION	SIZE (mm)			FILLING / MORPHOLOGY	COMMENTS	
			min.	max.	av.			
Vesicles	1	distributed		<0.1		filled with calcite / round		
COMMENTS :	The rock contains patches where crystallization of clinopyroxene is enhanced; these patches are frequently associated with the presence of calcite. In one case, small crystals of clinopyroxene with euhedral terminations was observed, presumably where it grew into a void. The void is now filled with calcite.							

187-1157B-2R-1, 48-51 cm (TS#37)			Unit: 1			OBSERVER:	Kempton	
ROCK NAME:	Moderately plagioclase-olivine phyric basalt							
WHERE SAMPLED:	chilled margin							
GRAIN SIZE:	microcrystalline to cryptocrystalline							
TEXTURE:	ranges from glassy to intersertal							
PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)			APPROX. COMP.	MORPHOLOGY	COMMENTS
			min.	max.	av.			
PHENOCRYSTS								
Plagioclase	4	4	0.3	2			prismatic	Albite twins; some discontinuous zoning; some sieve textures, varies from embayed cores to embayed rims.
Olivine Clinopyroxene	1	1	0.3	1.5			equant, skeletal	
GROUNDMASS								
Olivine	2	2		0.3			equant	Less than 10% altered to Fe oxyhydroxides + clay.
Plagioclase	20	20		0.3			acicular	
Clinopyroxene								Refers to clear glass only. Includes a combination of quench plagioclase, glass and probably olivine and/or clinopyroxene.
Opaque Minerals	1	1		<2 microns			equant	
Glass	3	3						
Quench Mesostasis	64	69						
SECONDARY MINERALOGY	PERCENT		SIZE (mm)				REPLACING / FILLING	COMMENTS
			min.	max.	av.			
Clays + Fe oxyhydroxides	5						replacing olivine and groundmass	
VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)				FILLING / MORPHOLOGY	COMMENTS
			min.	max.	av.			
Vesicles	1	distributed		0.2				Lined with a colorless clay.
COMMENTS :	Clusters of plagioclase and olivine are present, but these glomerocrysts, as well as sieve textured plagioclase, are less common than in previous holes. Two types of glomerocrysts are present: (1) a loose collection of phenocryst phases and (2) probably xenocrysts of cumulate origin. The spherulites are also unusually small, with less than 20-25 microns of quench growth surrounding plagioclase microlites. There is no quench growth around the olivine phenocrysts/microphenocrysts. One large olivine (1.5 cm) partially encloses plagioclase, suggesting that these are xenocrysts; most olivine is less than 0.5 cm in maximum diameter.							

187-1157B-3R-1, 62-67 cm (TS#39)			Unit: 1			OBSERVER:		Kempton	
ROCK NAME:		Moderately plagioclase-olivine phyric basalt							
WHERE SAMPLED:									
GRAIN SIZE:		microcrystalline to cryptocrystalline							
TEXTURE:		sheaf quench texture to intersertal							
PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)			APPROX. COMP.	MORPHOLOGY	COMMENTS	
			min.	max.	av.				
PHENOCRYSTS									
Plagioclase	4	4	0.5	3			prismatic to tabular	Some discontinuous zoning, albite twins; some sieve textures; minor replacement along microcracks by Fe oxyhydroxides and clay in some crystals.	
Olivine	2	2	0.1	2.5			skeletal to subhedral and euhedral	Less than 10% alteration to Fe oxyhydroxides + clay.	
Clinopyroxene									
Cr spinel	tr	tr		50 microns			equant, euhedral		
GROUNDMASS									
Olivine	2	2		0.1			equant, anhedral to skeletal	Aspect ratio of acicular crystals ~25:1.	
Plagioclase	30	30		0.5			acicular to skeletal (swallowtail) to sheaf quench morphologies		
Clinopyroxene	see comment						occurs as plumose quench morphologies		
Opaque Minerals	1	1		2 microns			equant	<1% sulfide globules?	
Glass									
Mesostasis	45	60						Includes a combination of quench plagioclase, clinopyroxene, olivine and glass not readily identifiable.	
SECONDARY MINERALOGY	PERCENT	LOCATION	SIZE (mm)			REPLACING / FILLING	COMMENTS		
			min.	max.	av.				
Clays + Fe oxyhydroxides	15					replacing quench groundmass material and olivines	Most groundmass olivine is totally unaltered.		
VESICLES/CAVITIES	PERCENT	LOCATION	SIZE (mm)			FILLING / MORPHOLOGY	COMMENTS		
			min.	max.	av.				
Vesicles	1			0.1			Unfilled?, may be lined with silica or clay?		
COMMENTS : Plagioclase + olivine clusters common. Both plagioclase and olivine are seriate, so distinguishing maximum groundmass and minimum phenocryst is arbitrary. Groundmass texture coarsens from one side of slide to the other, ranging from predominantly acicular plagioclase crystals within a very immature sheaf to plumose matrix to more fully developed plagioclase sheafs interspersed with patches of plumose quench growth (probably clinopyroxene).									

187-1157B-3R-1, 97-101 cm (TS#40)			Unit: 1			OBSERVER:	Kempton	
ROCK NAME:	Moderately plagioclase-olivine phyric basalt							
WHERE SAMPLED:	piece with crosscutting vein							
GRAIN SIZE:	microcrystalline							
TEXTURE:	intersertal							
PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)			APPROX. COMP.	MORPHOLOGY	COMMENTS
			min.	max.	av.			
PHENOCRYSTS								
Plagioclase	4	4	0.3	1.6			tabular to prismatic	Albite twins; most are unzoned; some larger crystals have embayed cores and discontinuous zoning. Fe staining along microcracks in crystals near the vein.
Olivine	2	2					equant, skeletal	Partially (~10%) replaced by iddingsite adjacent to the vein.
Clinopyroxene								
Cr spinel	tr	tr		0.2			equant, anhedral	
GROUNDMASS								
Olivine	2	2						
Plagioclase	35	35		0.8			acicular to skeletal	Aspect ratio 30:1
Clinopyroxene	1	1		0.5			plumose quench to anhedral granules	Larger anhedral crystals grow adjacent to miarolitic cavities; modal estimate is for these only, quench growth included with mesostasis.
Opaque Minerals	2	2		<2 microns			equant	Larger anhedral (up to 20 microns) crystals grow adjacent to miarolitic cavities.
Glass								
Mesostasis	38	53						Includes a combination of quench plagioclase, clinopyroxene, olivine and glass not readily distinguishable.
SECONDARY MINERALOGY	PERCENT		SIZE (mm)				REPLACING / FILLING	COMMENTS
			min.	max.	av.			
Clays+Fe oxyhydroxides	15						groundmass	Ranges from 20-30% adjacent to the vein to ~10% away from the vein.
Calcite	<1						groundmass	only adjacent to vein
VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)				FILLING / MORPHOLOGY	COMMENTS
			min.	max.	av.			
Miarolitic cavities	1	distributed	0.1	0.7			unfilled?	Enhanced crystal growth adjacent.
Vesicles	tr			0.1			lined with Fe oxyhydroxides	
COMMENTS (Basalt) : Modal estimates above exclude the vein. The basalt contains miarolitic cavities; crystallization of groundmass clinopyroxene and oxides are enhanced here, as well as some increase in the amount of Fe oxyhydroxides + clay.								
COMMENTS (Vein): The vein, which is ~3 mm wide, consists of micritic to very finely crystalline sparry calcite (crystal sizes 10-20 microns) in roughly equal proportions, although micrite predominates at one end of the thin section and the very finely crystalline spar at the other. Within the sparry calcite areas, there are islands of micrite that tend to have oval shapes elongate parallel to the vein boundaries. It may be that the sparry calcite is derived from the micrite by neomorphism. The vein contains less than 5% lithic clasts, which include unaltered basalt that could have been derived from the wall rock and several fragments of a basaltic chilled margin (bearing immature plagioclase sheaf and plumose quench textures), which must therefore have been derived from outside the immediate wall rock area. A sparry calcite vein made of radial calcite occurs along part of one margin. The margins of the vein are irregular and consist of inlets of pale brown clay and/or clay-bearing? micrite that are truncated by the more sparry portion of the vein. The irregular boundaries are consistent with partial replacement of the wallrock mafic phases by clay and/or a brown to colorless fibrous mineral (chlorite? or fibrous amphibole?), replacement of groundmass plagioclase by clay and later calcite.								

187-1157B-3R-1, 137-140 cm (TS#41) **Unit: 1** **OBSERVER:** **Kempton**
ROCK NAME: **Moderately plagioclase-olivine phyric basalt**
WHERE SAMPLED: **piece crosscut by a micritic calcite vein**
GRAIN SIZE: **microcrystalline**
TEXTURE: **immature sheaf texture with some plumose quench growth**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)			APPROX. COMP.	MORPHOLOGY	COMMENTS
			min.	max.	av.			
PHENOCRYSTS								
Plagioclase	4	4	0.3	2.5			prismatic to tabular	Some crystals Fe stained along microcracks. Discontinuous zoning, albite twinning and sieve textures present in some crystals.
Olivine	2	2	0.3	1			equant, skeletal	Some crystals Fe stained along microcracks. Discontinuous zoning, albite twinning and sieve textures present in some crystals.
Clinopyroxene								
GROUNDMASS								
Olivine	2	2		0.1				
Plagioclase	25	25		0.5			acicular to skeletal to immature sheaf quench morphologies	Aspect ratio of acicular crystals ~25:1.
Clinopyroxene	see comment						occurs as immature plumose quench morphologies	
Opaque Minerals	1	1		2 microns			equant	<1% sulfide globules?
Glass								
Mesostasis	41	66						Includes a combination of quench plagioclase, clinopyroxene, olivine and glass not readily distinguishable.

SECONDARY MINERALOGY	PERCENT	SIZE (mm)			REPLACING / FILLING	COMMENTS
		min.	max.	av.		
Clays + Fe oxyhydroxides	24					
Calcite	1					Replaces groundmass adjacent to the vein.

VESICLES/CAVITIES	PERCENT	LOCATION	SIZE (mm)			FILLING / MORPHOLOGY	COMMENTS
			min.	max.	av.		
Vesicles	<1	distributed		0.1			Unfilled.

COMMENTS (Basalt) : Modes listed exclude the crosscutting vein, which is described below. The alteration halo makes up ~50% of the thin section and in this area groundmass glass and/or quench phases are ~ 30-50% replaced by Fe oxyhydroxides + clay. Quench plagioclase and clinopyroxene appear to be unaffected by this replacement, so it's probably olivine + glass. Both plagioclase and olivine are seriate, so maximum size for groundmass and minimum phenocryst size are arbitrary. Clusters of plagioclase and olivine are common.

COMMENTS (Vein) : The vein, which is 3 mm wide, is composed predominantly of micritic calcite. The boundaries with the basalt wall rock are irregular, and suggest replacement and/or erosion of wall rock mineral phases, particularly the groundmass phases. The boundary is lined with Fe oxyhydroxides ± clay ± calcite ± aragonite (?) over a width of ~50 to 200 microns; it appears that groundmass olivine and/or glass is being converted in Fe oxyhydroxides and groundmass plagioclase is being replaced by clay followed by calcite (?). The vein contains ~ 40% lithic clasts, which include: plagioclase (angular fragments, unaltered, up to 3 mm long), olivine (in one case pseudomorphed by calcite, in another by a pale buff clay), palagonite, basalt in various stages of disaggregation and MnO concretions. The origin of the clasts, whether local (i.e. from the adjacent wall rock) or foreign, is difficult to assess due to the advanced state of alteration of most. Many are clearly from disaggregated wall rock, but the high abundance of palagonite fragments suggests that many have been transported from elsewhere.

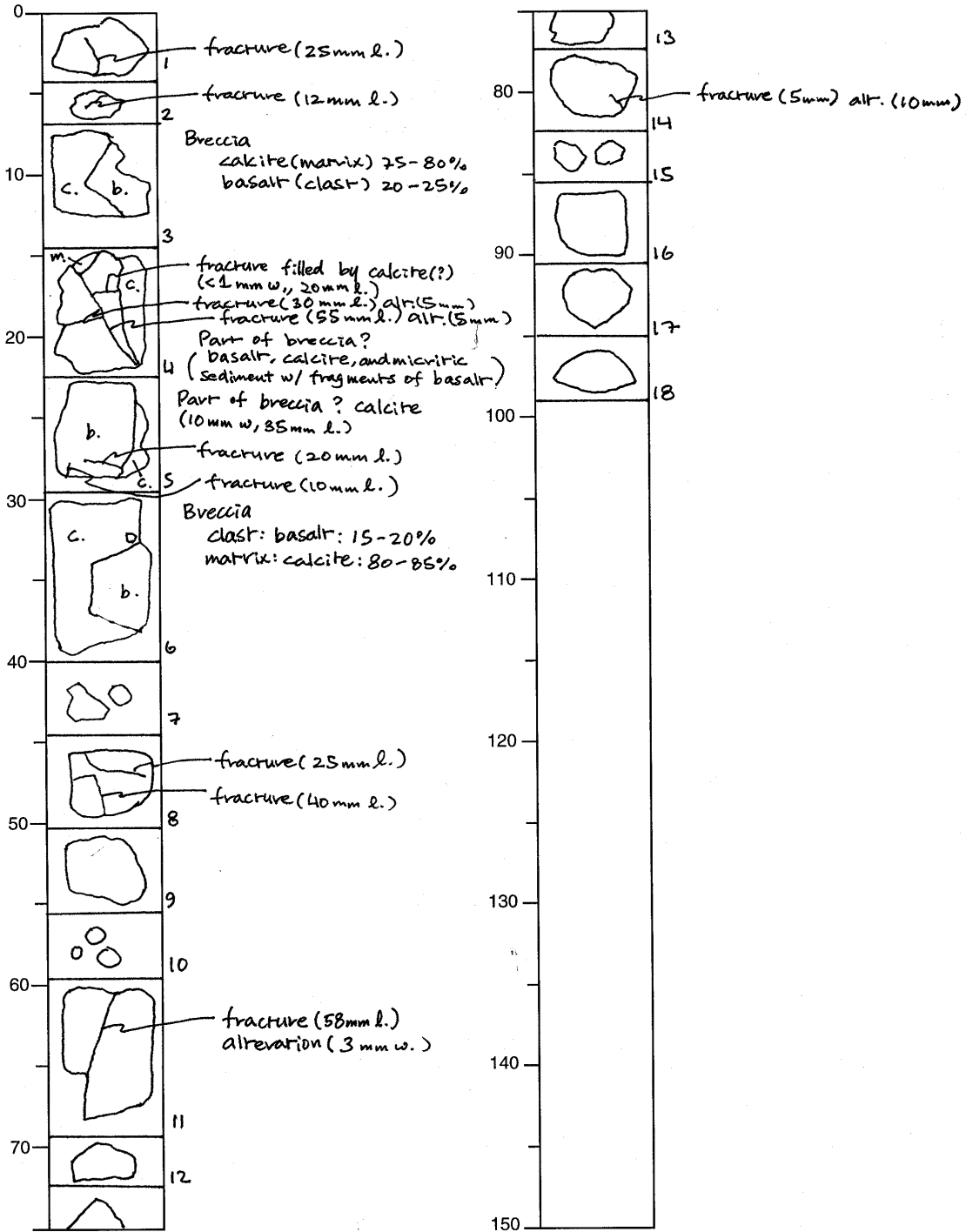
187-1157B-5R-1, 54-57 cm (TS#42)			Unit: 1			OBSERVER:	Kempton	
ROCK NAME:	Moderately plagioclase-olivine phyric basalt							
WHERE SAMPLED:	piece with crosscutting micrite and sparry calcite veins							
GRAIN SIZE:	microcrystalline							
TEXTURE:	immature plagioclase sheaf texture							
PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)			APPROX. COMP.	MORPHOLOGY	COMMENTS
			min.	max.	av.			
PHENOCRYSTS								
Plagioclase	4	4	0.3	2.2			tabular to prismatic, subhedral	Most unzoned; rare embayed rims; some Fe staining on microcracks near vein.
Olivine	2	3	0.3	1			equant to skeletal	Partially replaced by iddingsite, especially near vein.
Clinopyroxene								
Cr spinel	tr	tr		0.2			equant, anhedral to subhedral	Occurs as discrete crystals, not inclusions.
GROUNDMASS								
Olivine	1	1		0.3			equant to skeletal	
Plagioclase	30	30					acicular	Shows some preferred orientation, suggesting flow alignment.
Clinopyroxene							plumose quench texture	
Opaque Minerals	1	1		< 5 microns			equant	
Glass								
Mesostasis	22	61						Includes a combination of quench plagioclase, clinopyroxene, olivine and glass not readily distinguishable.
SECONDARY MINERALOGY	PERCENT	LOCATION	SIZE (mm)			REPLACING / FILLING	COMMENTS	
			min.	max.	av.			
Clays + Fe oxyhydroxides	40					replacing groundmass and olivine.	Concentrated in areas adjacent to the vein (~60% replacement); away from veins alteration is less (~5-10%).	
Calcite						replacing groundmass		
VESICLES/CAVITIES	PERCENT	LOCATION	SIZE (mm)			FILLING / MORPHOLOGY	COMMENTS	
			min.	max.	av.			
Vesicles	<1%			0.2		unfilled		
COMMENTS (Basalt): Modal estimates above exclude the vein.								
COMMENTS (Vein): The vein, which is ~3 mm wide, consists of micritic calcite. The vein contains ~25-30% lithic clasts. Many of these look like partially altered portions of basalt rafted away from the wallrock. Others are less clearly of local origin and suggest some transport. Also present are MnO concretions (0.8 mm in diameter). Discontinuous sparry calcite veins (up to 0.2 mm wide) parallel the sides of the micrite vein. The margins of the vein are irregular and consist of inlets of pale brown clay and/or clay-bearing micrite that are truncated by the main portion of the vein. The irregular boundaries are consistent with partial replacement of the wallrock mafic phases by clay and/or a brown to colorless fibrous mineral (either chlorite or fibrous amphibole), replacement of groundmass plagioclase by clay and later calcite.								

187-1157B-6R-1, 43-47 cm (TS#43)			Unit:1			OBSERVER:		Russo and Kempton	
ROCK NAME:		Moderately plagioclase olivine phyric basalt							
WHERE SAMPLED:		pillow interior							
GRAIN SIZE:		microcrystalline							
TEXTURE:		intersertal (with predominant sheaf and plumose quench crystal morphologies)							
PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)			APPROX. COMP.	MORPHOLOGY	COMMENTS	
			min.	max.	av.				
PHENOCRYSTS									
Plagioclase	3	3	0.5	3	1.5		prismatic to tabular	Albite twinning; discontinuous zoning v. common in large phenocrysts, but also present in some primatic ones.	
Olivine	2	2	0.5	2	1		subhedral to euhedral, skeletal	1 large anhedral crystal contains small (0.1 mm) inclusions of equant plagioclase, i.e. not like the acicular groundmass or prismatic phenocrysts.	
Clinopyroxene	tr	tr		0.4			anhedral	Occurs in a cluster with plagioclase.	
Cr spinel	tr	tr		0.6			euhedral	Discrete crystal.	
GROUNDMASS									
Olivine	1	1		< 50 microns			equant, skeletal		
Plagioclase	35	35					acicular	Plagioclase sheaf quench textures are also present.	
Clinopyroxene	20	20						Plumose quench textures.	
Opaque Minerals	1	1		<2 microns			equant		
Mesostasis	32	38							
SECONDARY MINERALOGY	PERCENT	LOCATION	SIZE (mm)			REPLACING / FILLING	COMMENTS		
			min.	max.	av.				
Clays + Fe oxhydroxides	5					replacing quench phases in plagioclase sheafs	Orange-brown color.		
Clay	1					replacing mesostasis	Pale brown color (almost colorless).		
VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)			FILLING / MORPHOLOGY	COMMENTS		
			min.	max.	av.				
Vesicles	<1			0.1					
COMMENTS :		Slide has more a more glassy groundmass at one end than the other making modal groundmass estimates difficult. Approximately half of the phenocrysts occur as plagioclase + olivine glomerocrysts; some olivines in the clusters are skeletal. Example ofglomerocryst pictured in Image 86.							

187-1157B-8R-2, 55-59 cm (TS#44)			Unit:1			OBSERVER:	Russo	
ROCK NAME:	Moderately plagioclase olivine phyric basalt							
WHERE SAMPLED:	pillow interior							
GRAIN SIZE:	microcrystalline							
TEXTURE:	intersertal							
PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)			APPROX. COMP.	MORPHOLOGY	COMMENTS
			min.	max.	av.			
PHENOCRYSTS								
Plagioclase	4	5	0.5	2.5	1.5		prismatic	Albite twinning; some sieve textures; some discontinuous zoning, but most are unzoned. Partially replaced by Fe oxyhydroxides and clay.
Olivine Clinopyroxene	1	2	0.5	1	0.8		subhedral	
GROUNDMASS								
Olivine	~2	2					equant, subhedral	Some sheaf textures are also seen. Occurs as plumose quench texture.
Plagioclase	44	44					acicular	
Clinopyroxene	15	15						
Mesostasis Glass	20	30						
SECONDARY MINERALOGY	PERCENT		SIZE (mm)				REPLACING / FILLING	COMMENTS
			min.	max.	av.			
Clays	~5						groundmass, filling vesicles	
Calcite	~5						groundmass and olivine	
VESICLES/ CAVITIES	PERCENT	LOCATION	SIZE (mm)				FILLING / MORPHOLOGY	COMMENTS
			min.	max.	av.			
Vesicles	~2		0.1	0.3	0.2		clay and/or calcite	Clay is yellow to yellowish-green in color.
COMMENTS :	Image 85 was taken from this sample and shows calcite replacement of an olivine phenocryst.							

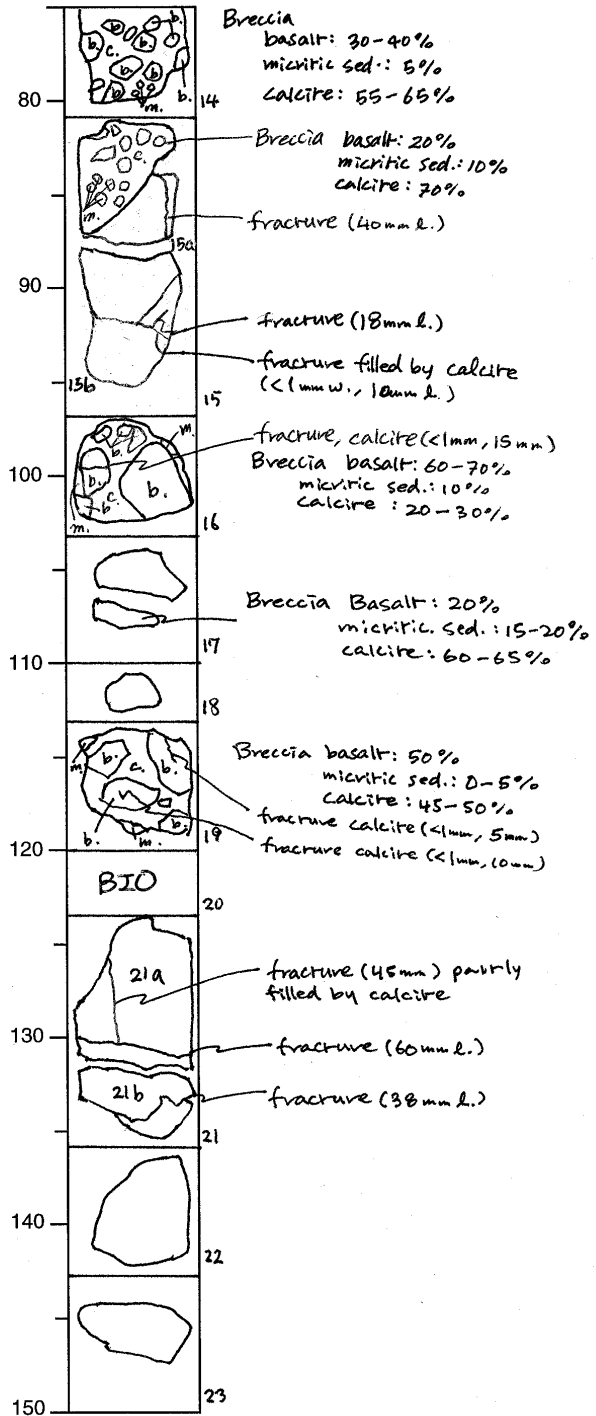
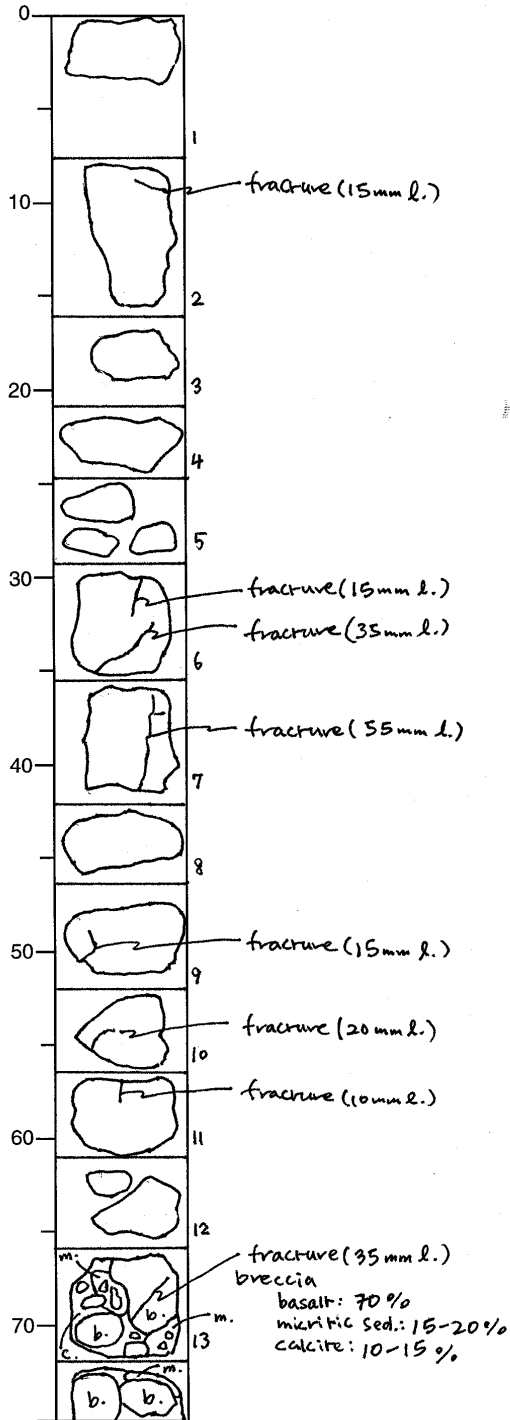
STRUCTURAL GEOLOGY DESCRIPTION

Leg	Hole	Core	Section	Observer
187	1157A	2R	1.	H.S.



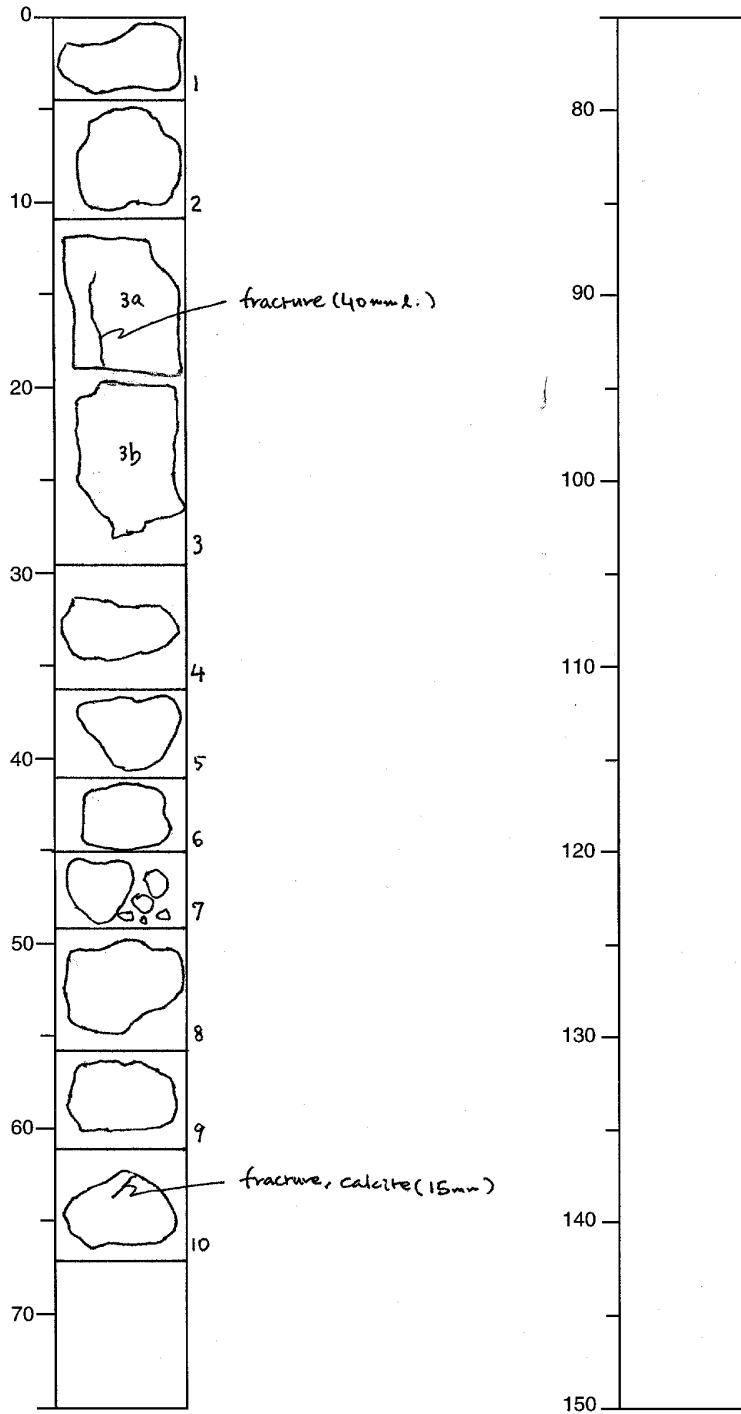
STRUCTURAL GEOLOGY DESCRIPTION

Leg	Hole	Core	Section	Observer
187	1157A	3	1	H.S.



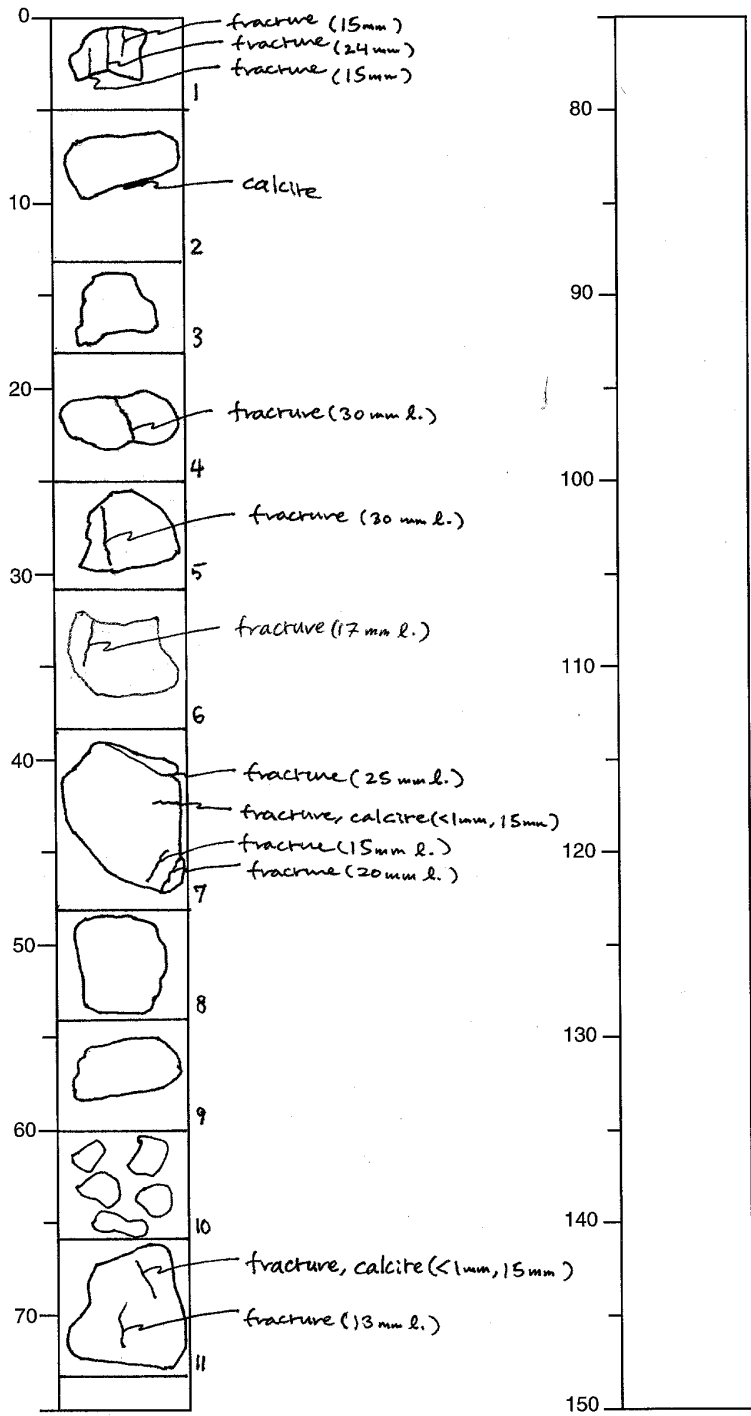
STRUCTURAL GEOLOGY DESCRIPTION

Leg	Hole	Core	Section	Observer
187	1157A	3	2	H.S.



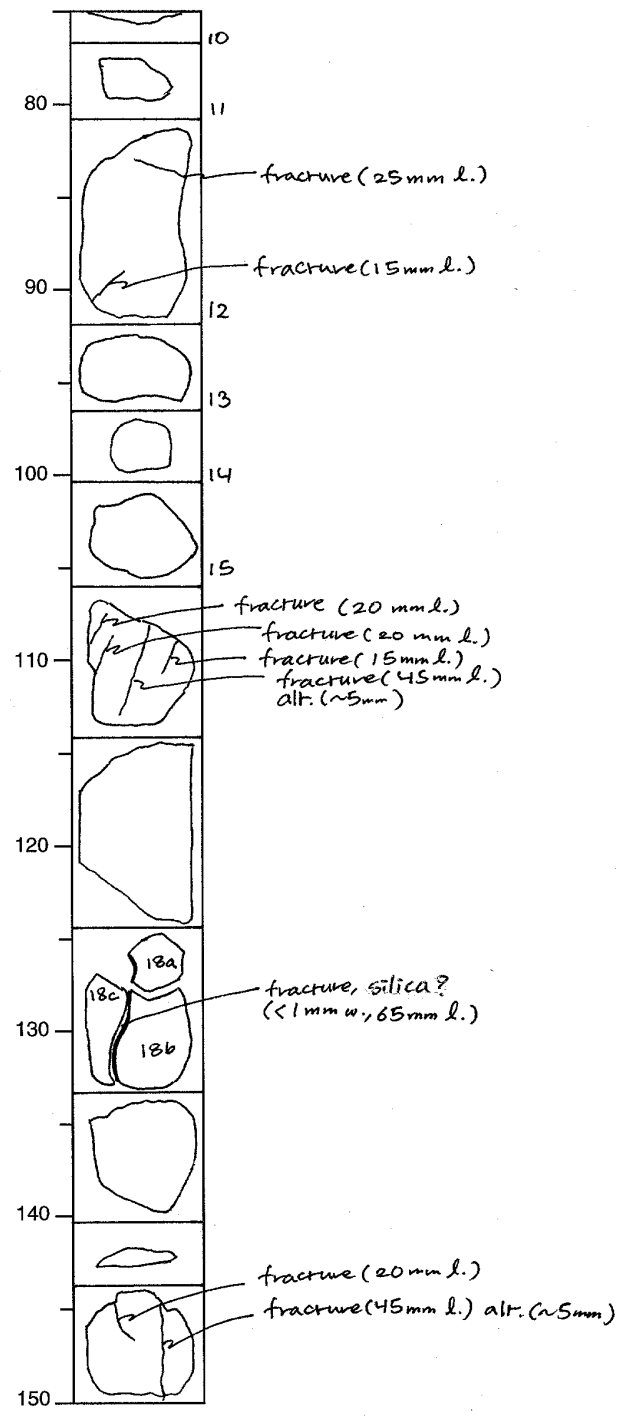
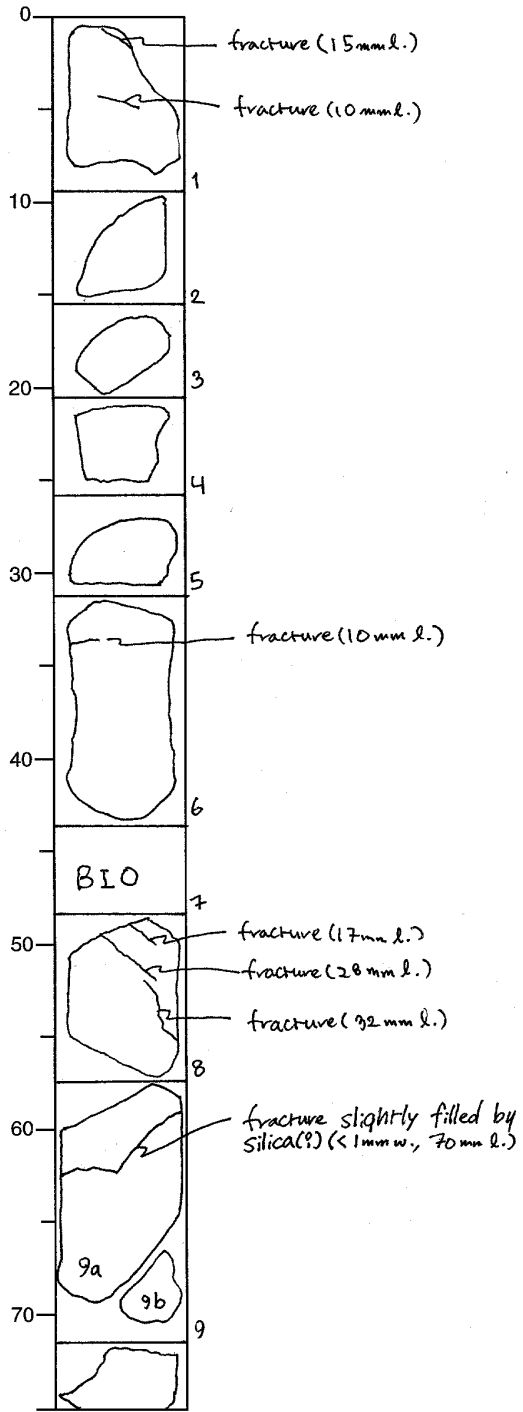
STRUCTURAL GEOLOGY DESCRIPTION

Leg	Hole	Core	Section
187	1157A	4	1



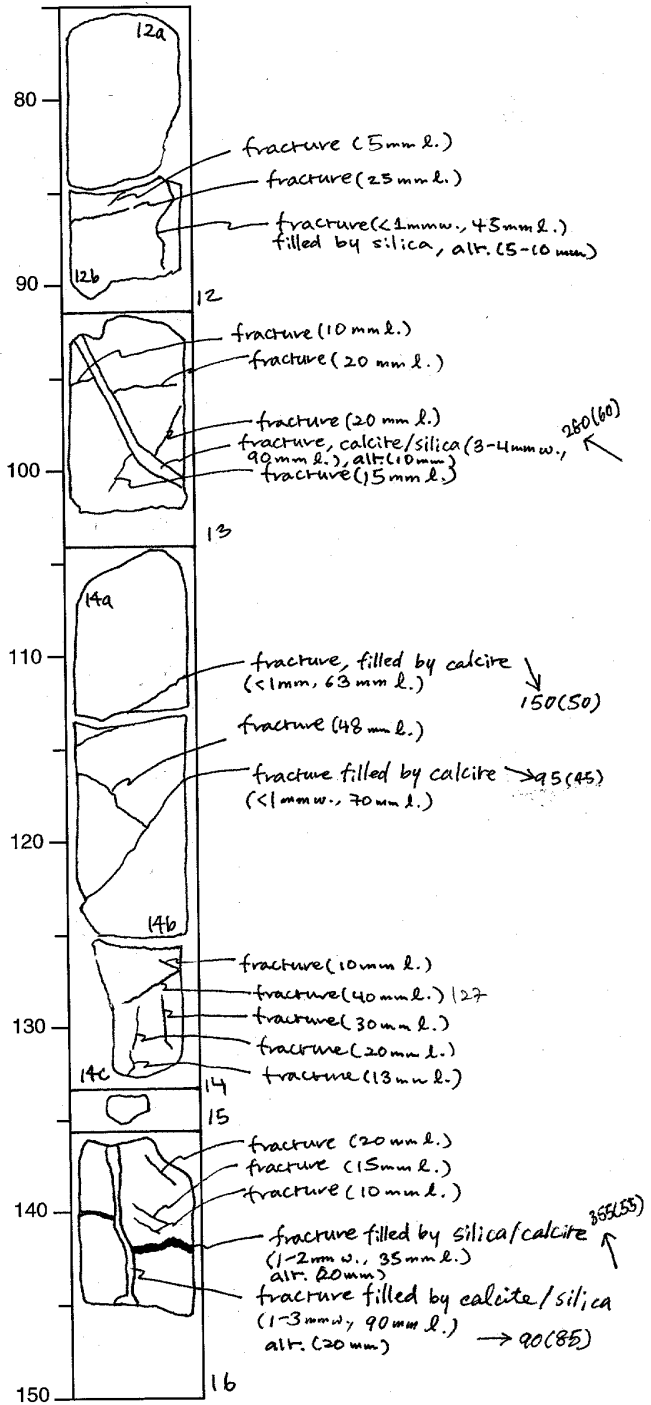
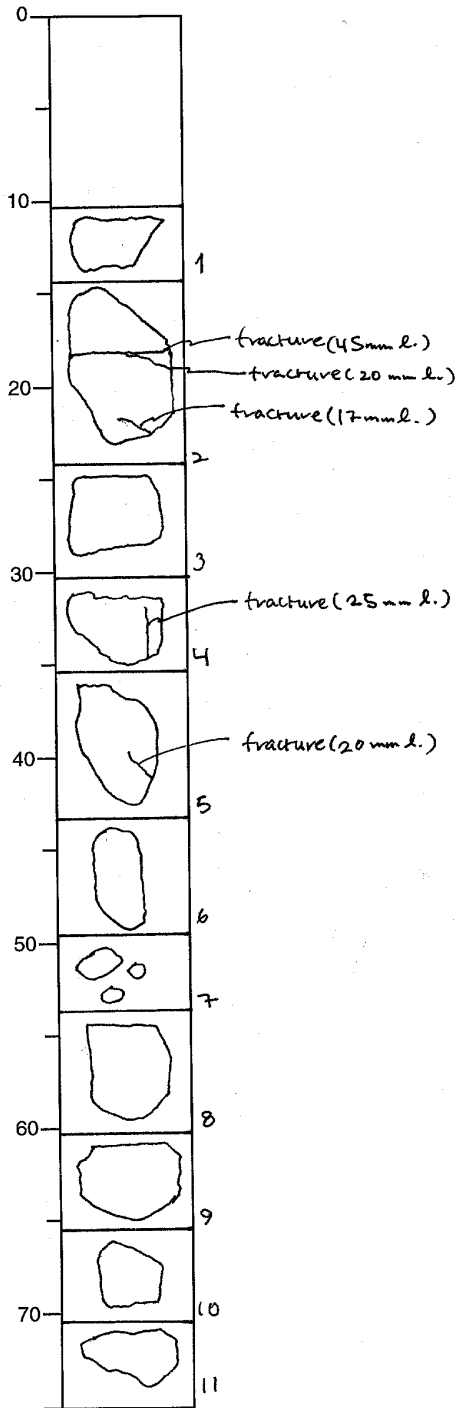
STRUCTURAL GEOLOGY DESCRIPTION

Leg	Hole	Core	Section	Observer
187	1157B	2R	1	



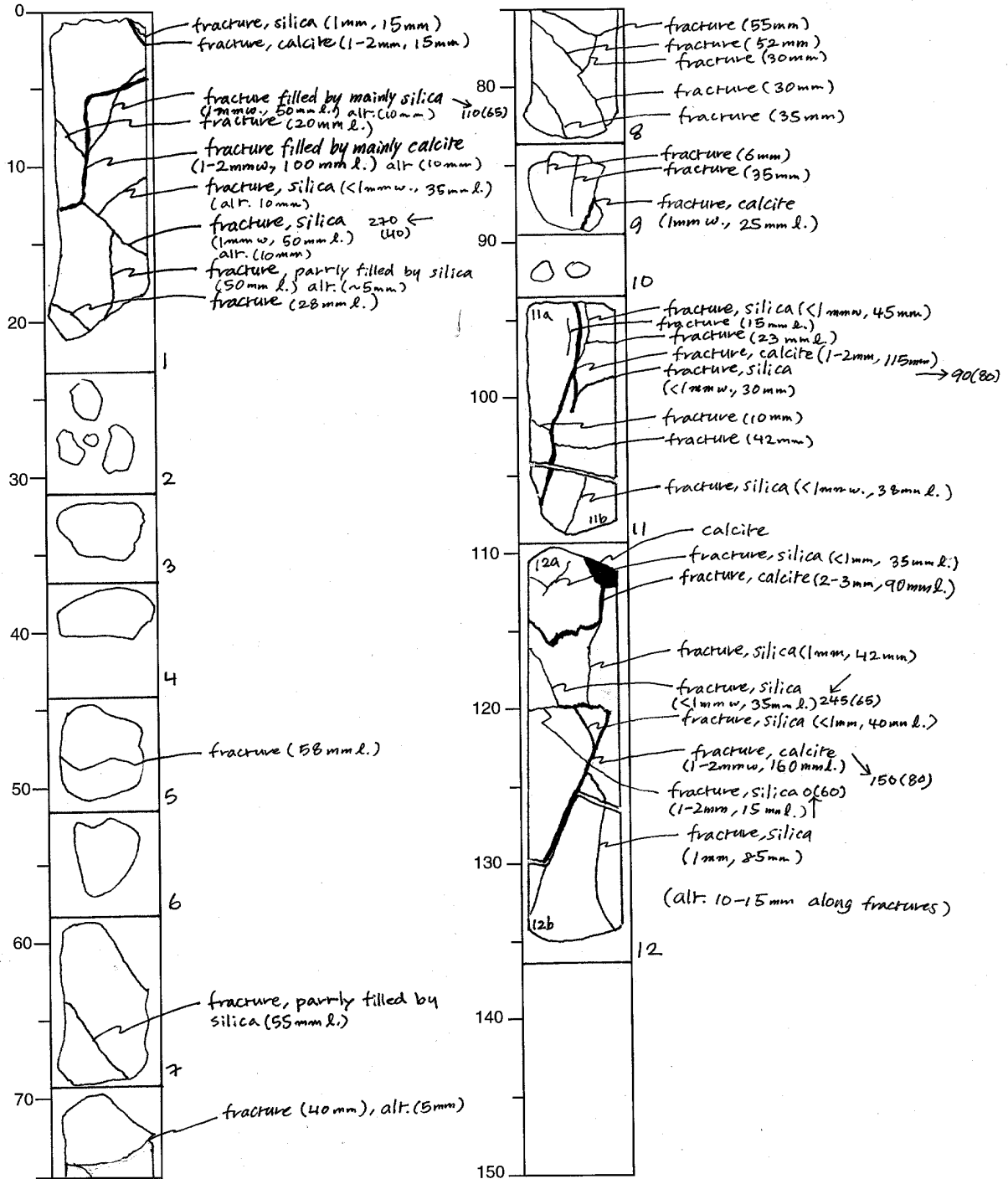
STRUCTURAL GEOLOGY DESCRIPTION

Leg	Hole	Core	Section	Observer
187	1157B	3R	1	H.S.



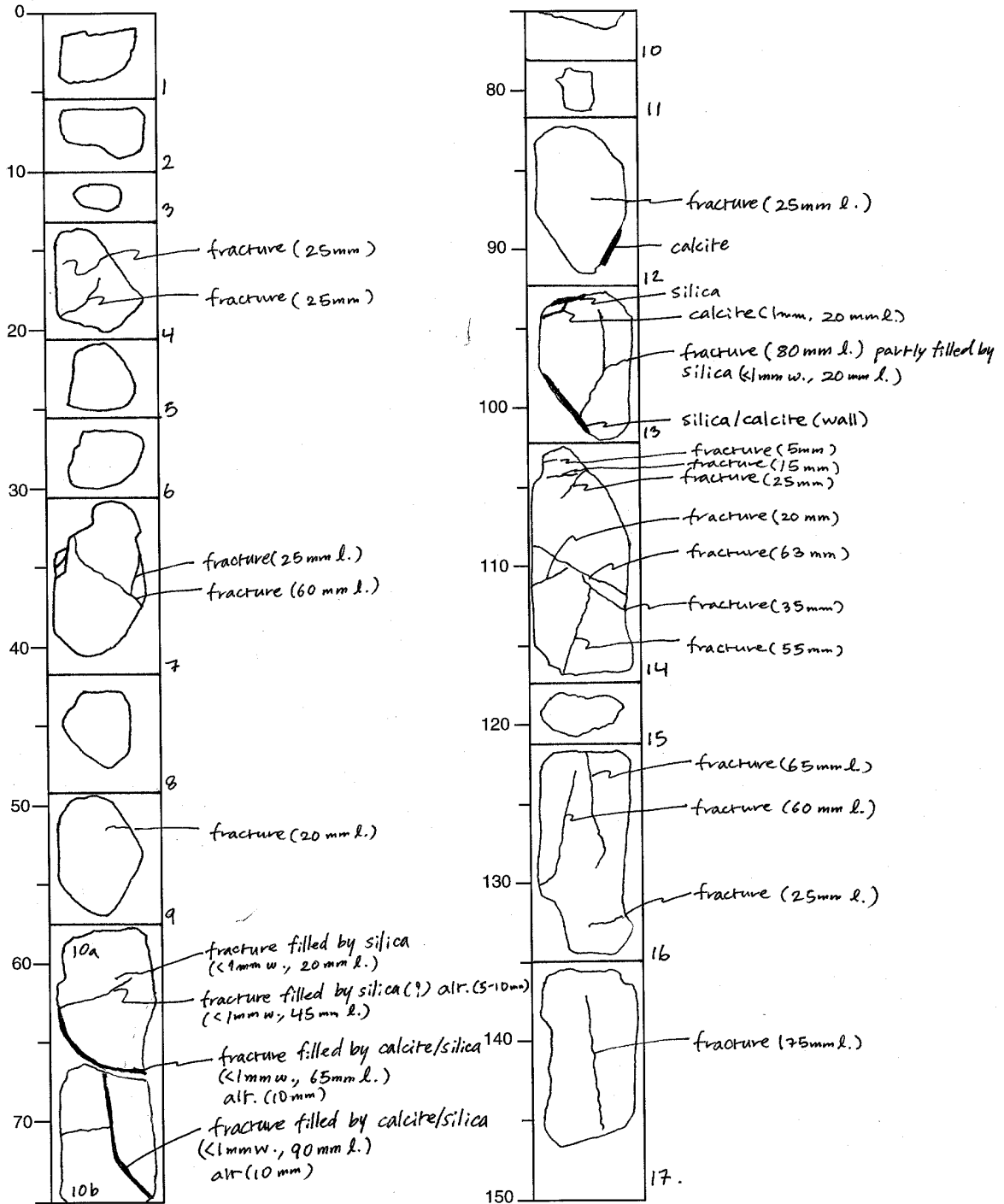
STRUCTURAL GEOLOGY DESCRIPTION

Leg	Hole	Core	Section	Observer
187	1157B	3R	2	



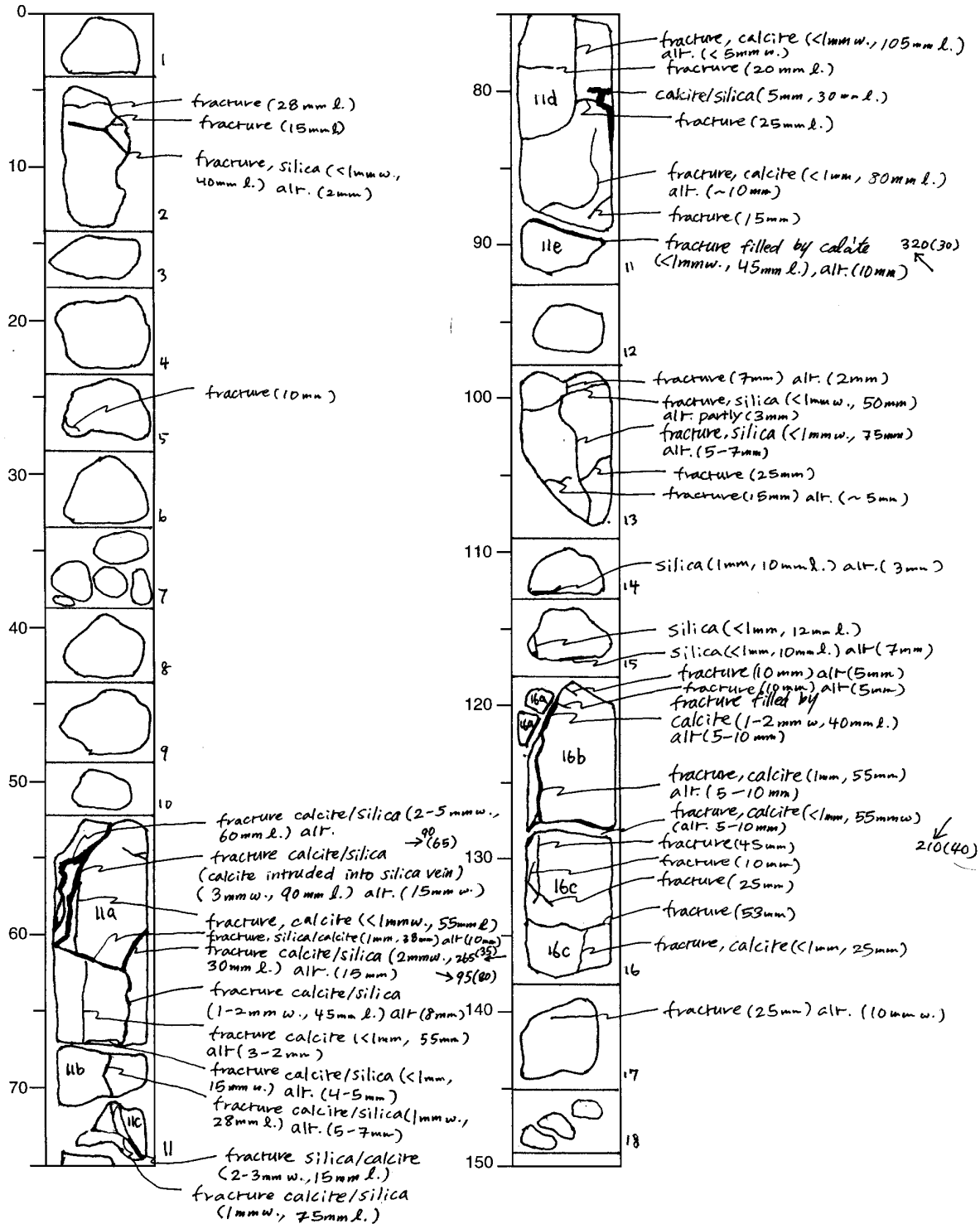
STRUCTURAL GEOLOGY DESCRIPTION

Leg	Hole	Core	Section	Observer
187	1157B	4R	1.	HS



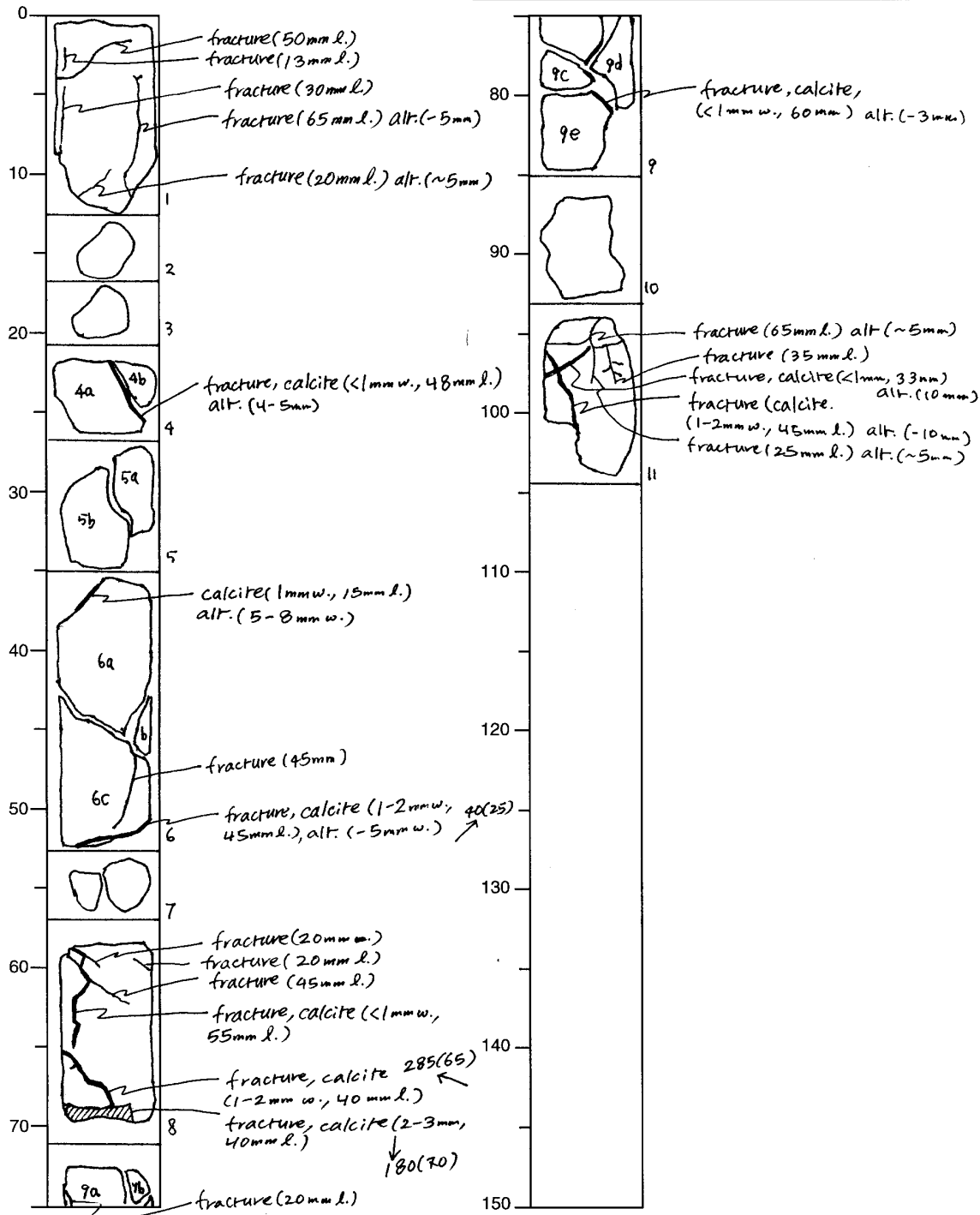
STRUCTURAL GEOLOGY DESCRIPTION

Leg	Hole	Core	Section	Observer
187	1157B	5R	1	H.S.



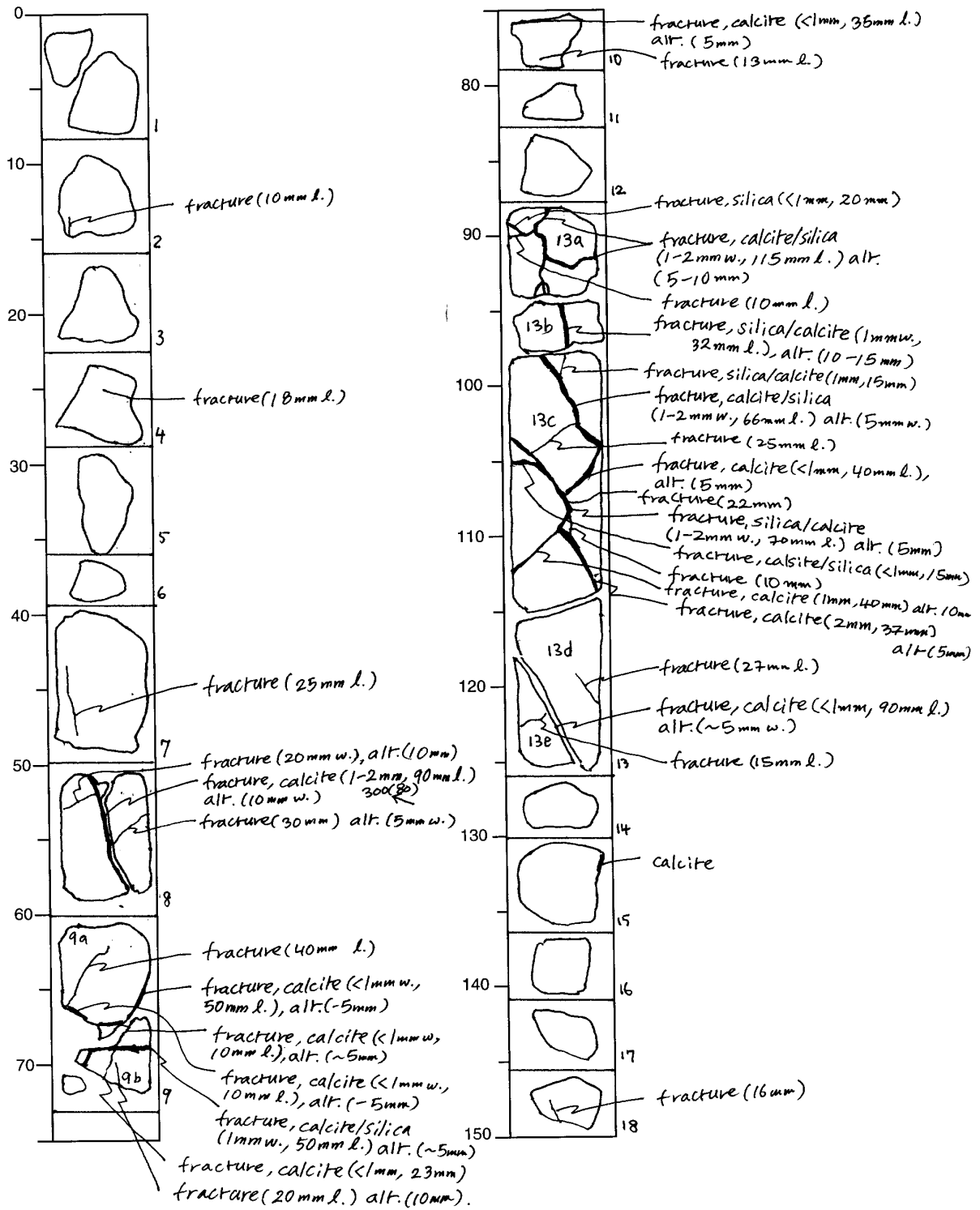
STRUCTURAL GEOLOGY DESCRIPTION

Leg	Hole	Core	Section	Observer
187	1157B	5R	2	H.S.



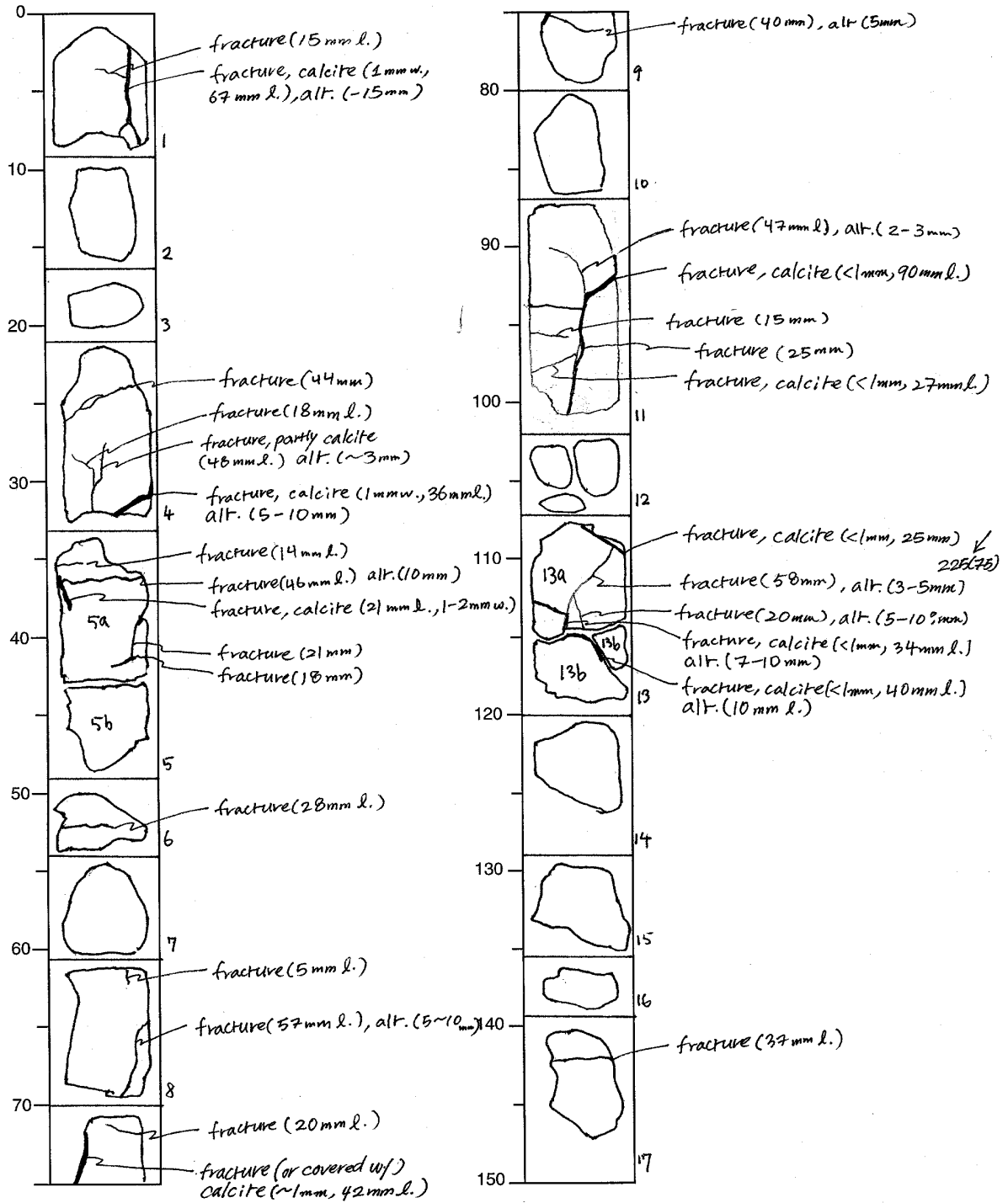
STRUCTURAL GEOLOGY DESCRIPTION

Leg	Hole	Core	Section	Observer
187	1157B	6R	1	H.S.



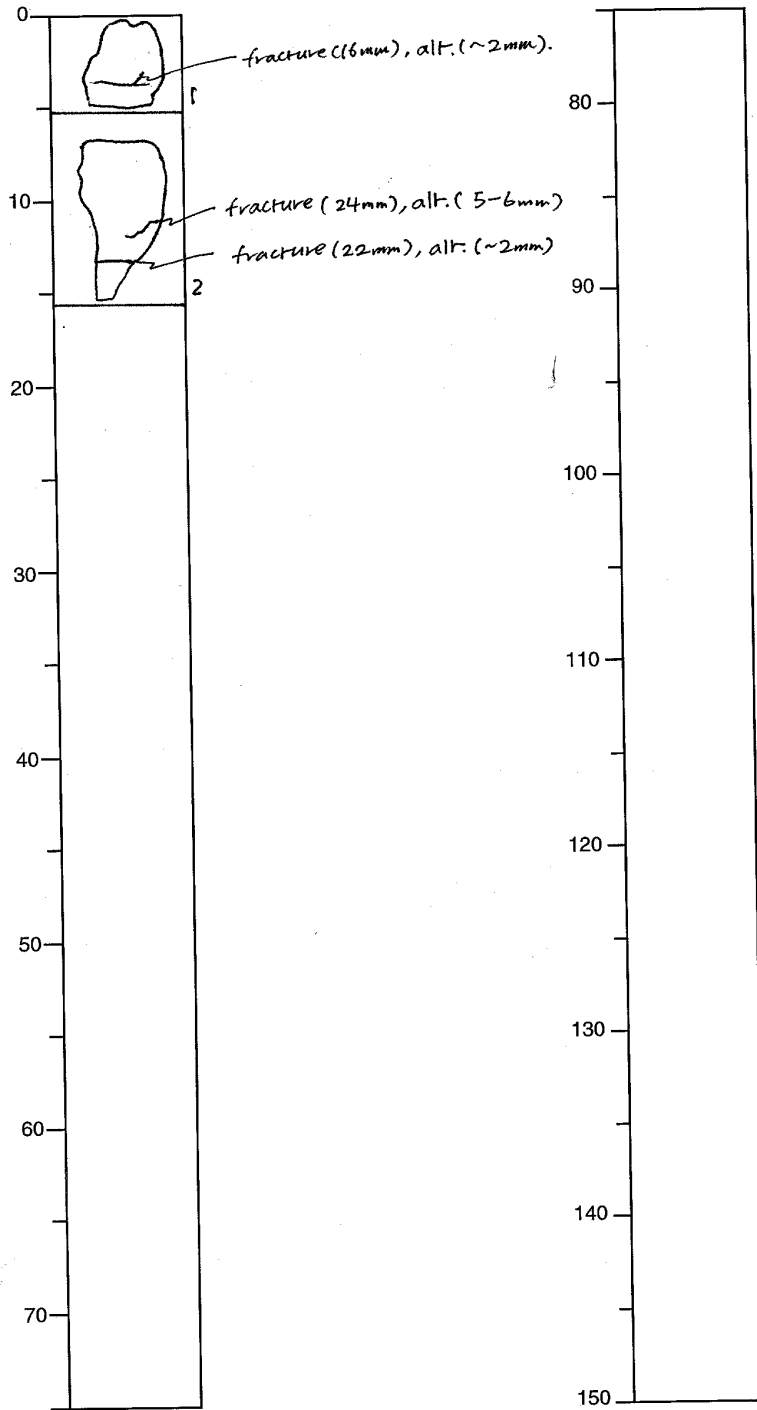
STRUCTURAL GEOLOGY DESCRIPTION

Leg	Hole	Core	Section	Observer
187	1157B	6R	2	H.S.



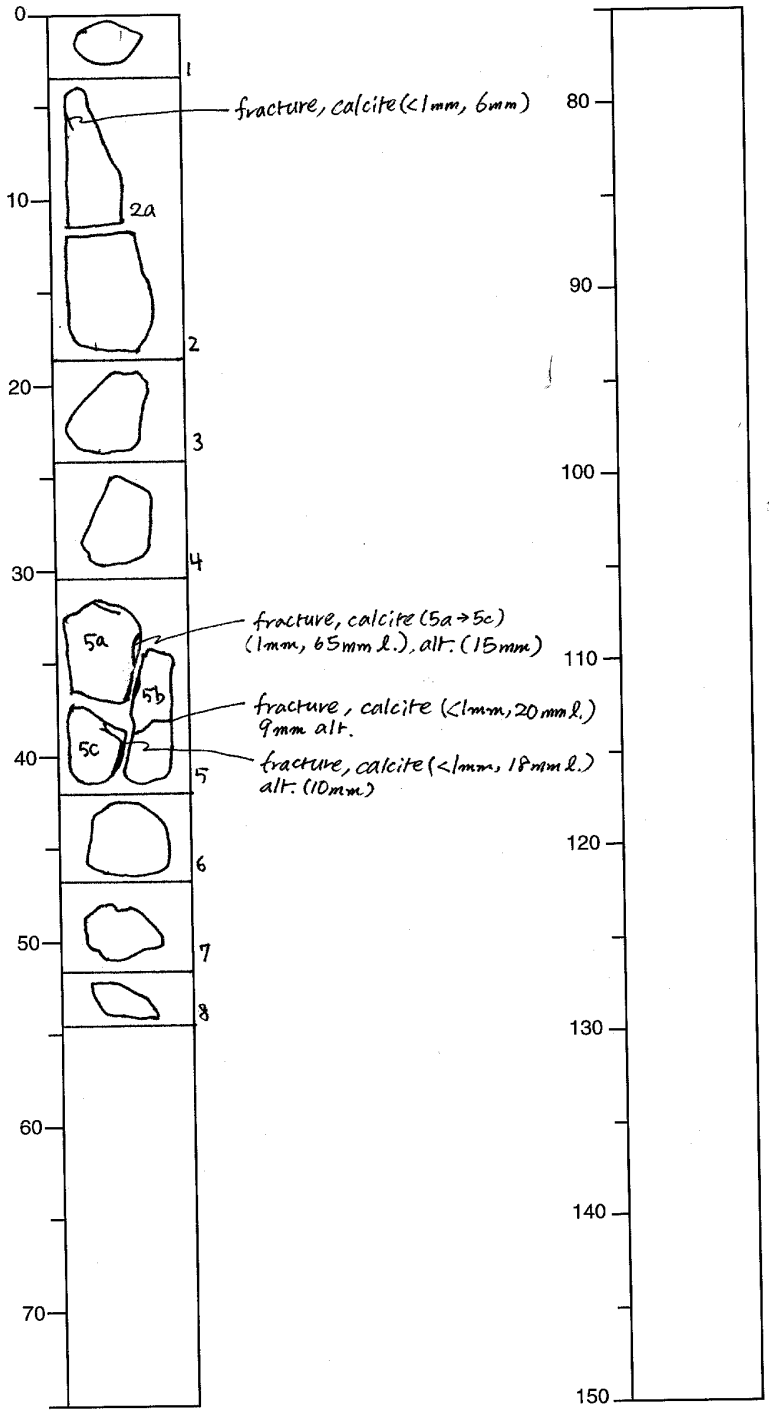
STRUCTURAL GEOLOGY DESCRIPTION

Leg	Hole	Core	Section
187	1157B	6	3



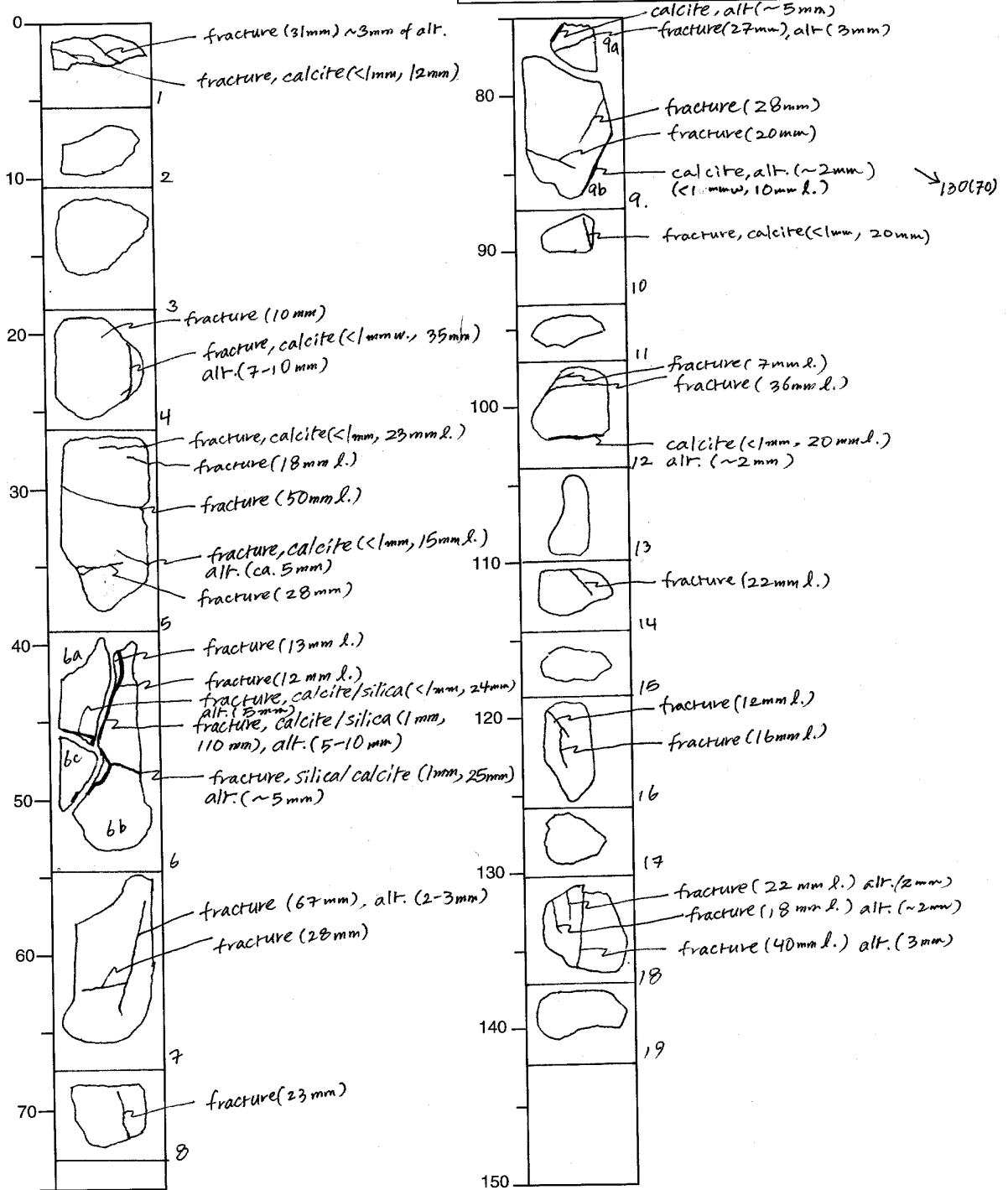
STRUCTURAL GEOLOGY DESCRIPTION

Leg	Hole	Core	Section
187	1157B	7R	1



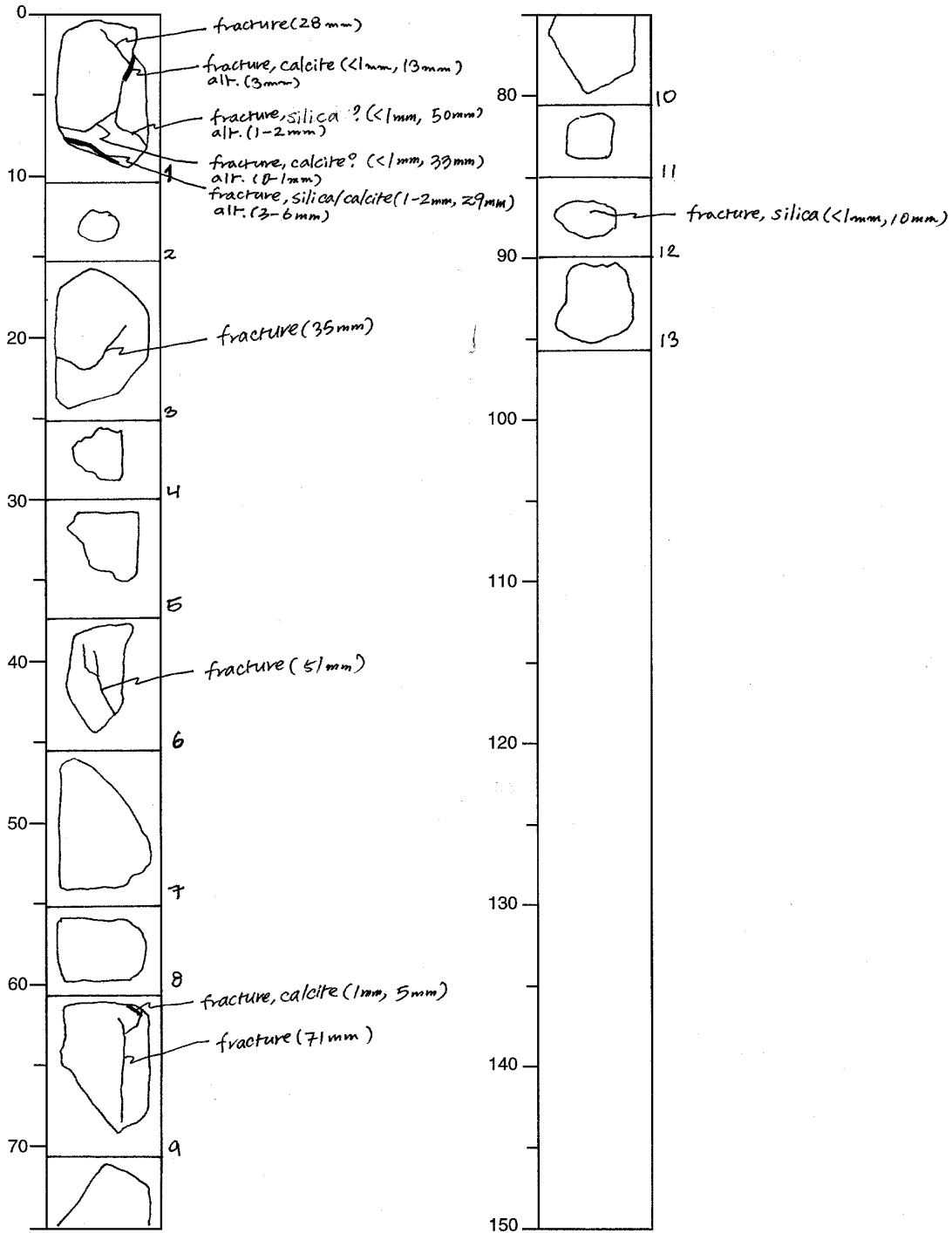
STRUCTURAL GEOLOGY DESCRIPTION

Leg	Hole	Core	Section	Observer
187	1157B	8R	1	



STRUCTURAL GEOLOGY DESCRIPTION

Leg	Hole	Core	Section	Observer
187	1157B	8R	2.	H.S.



STRUCTURAL GEOLOGY DESCRIPTION

Leg	Hole	Core	Section
187	1157B	9R	1.

