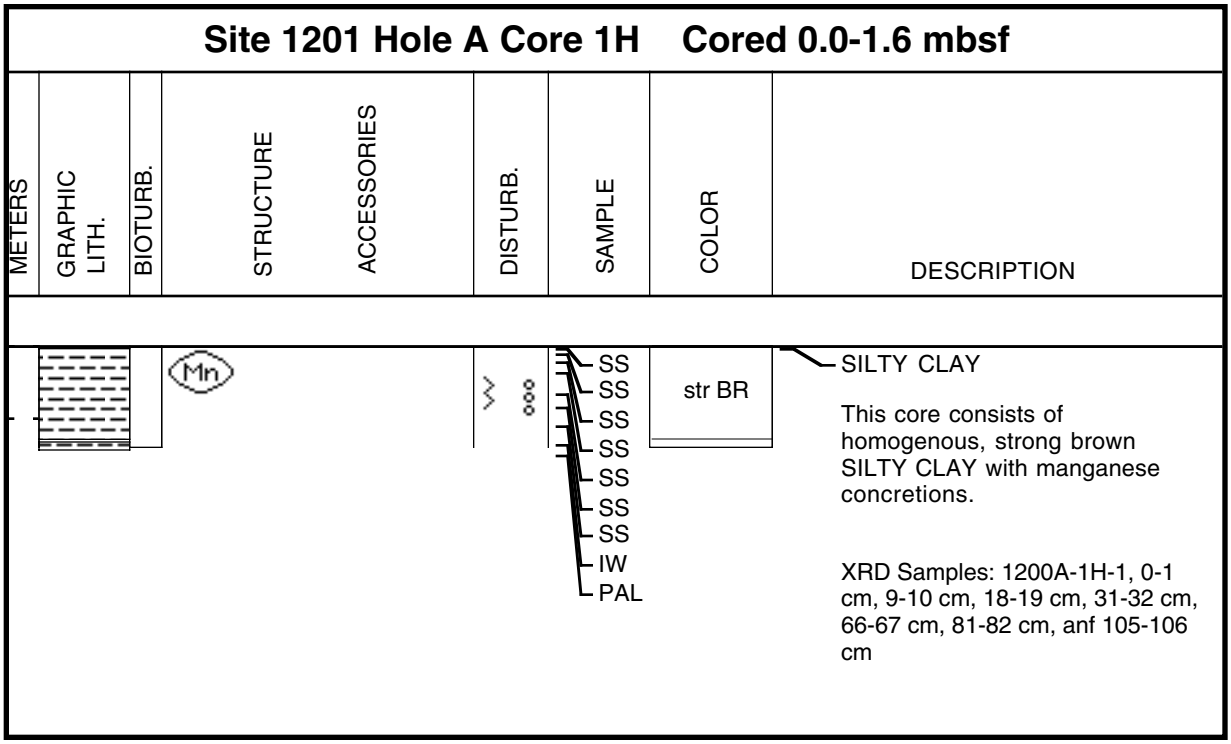
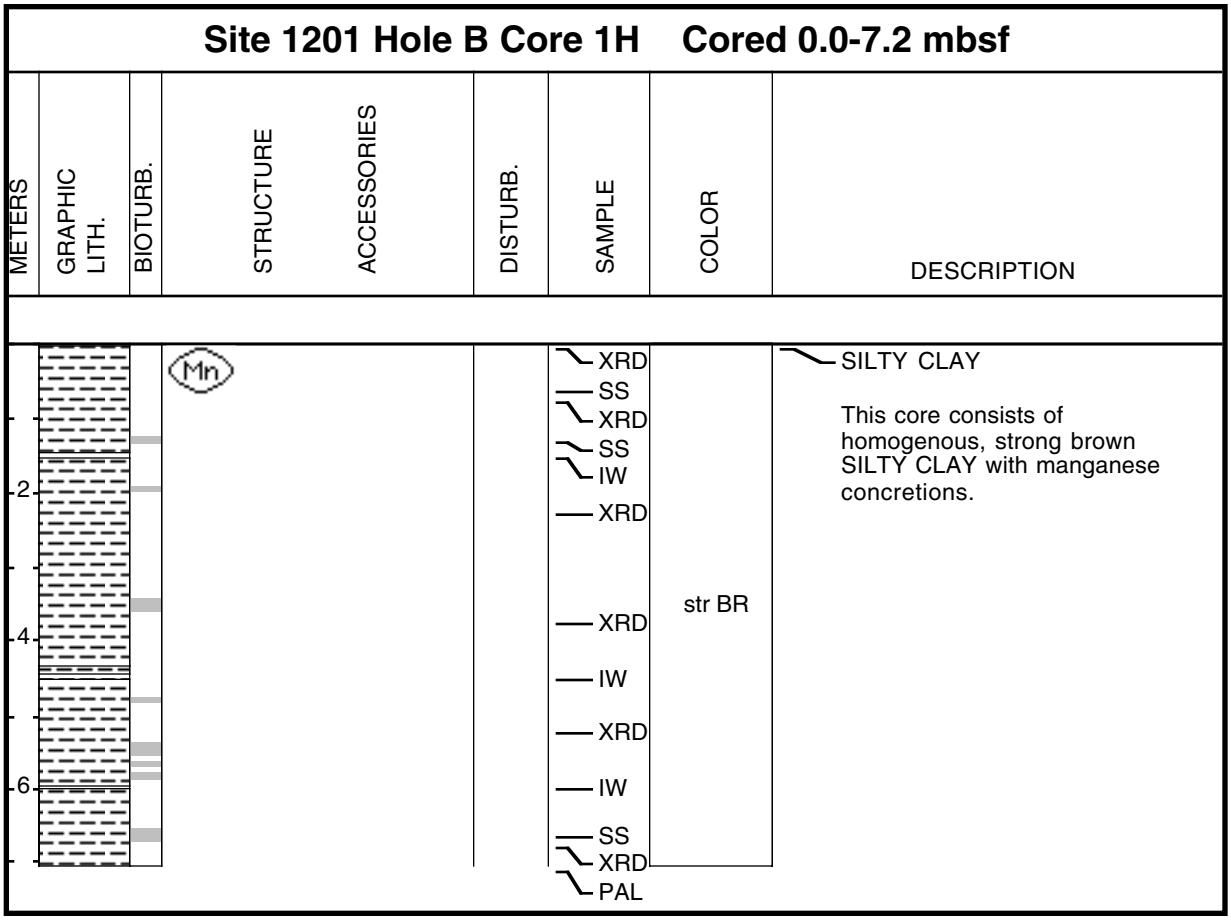
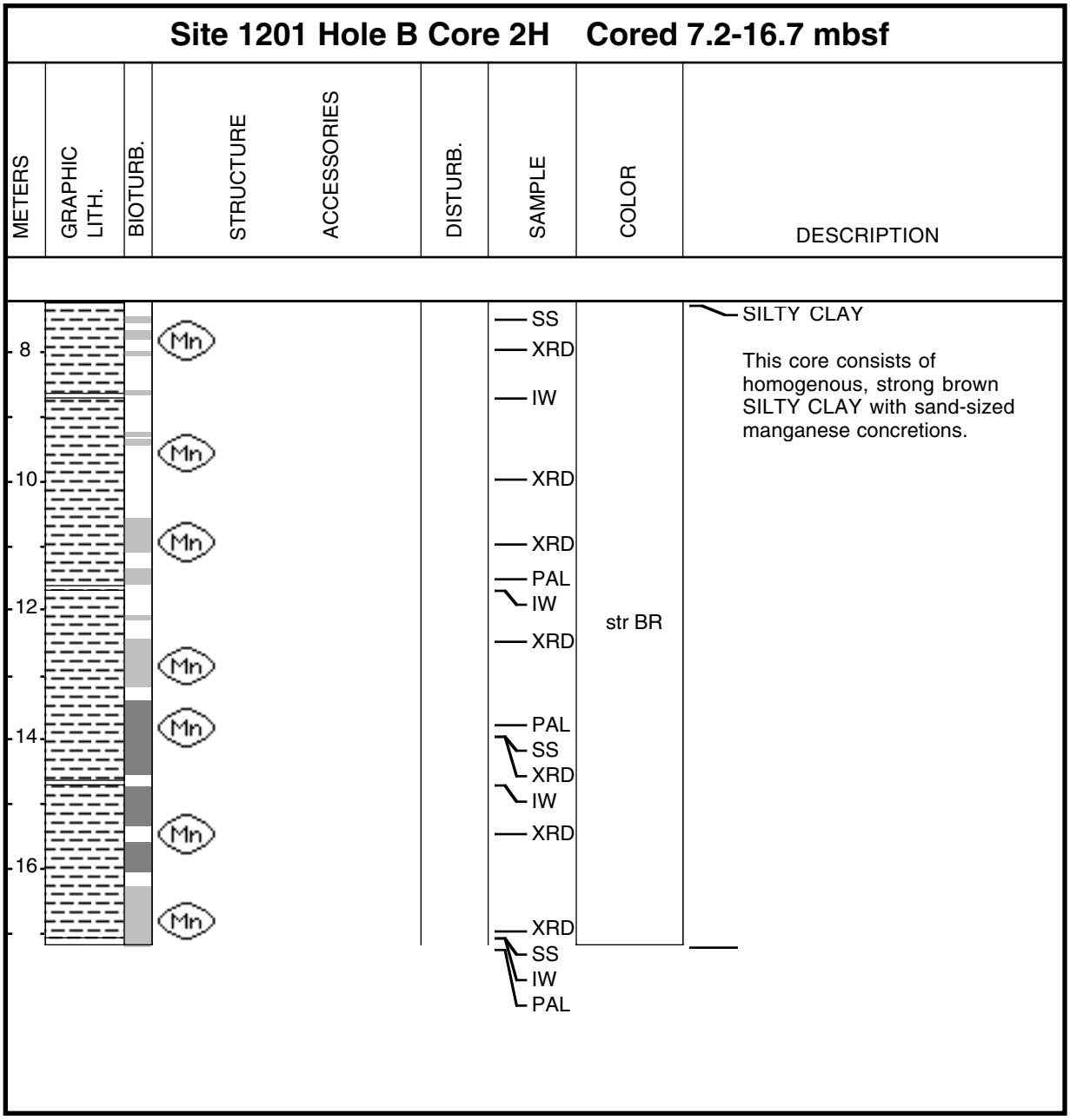
Core Photo


Site 1201 Hole A Core 1H Cored 0.0-1.6 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
Mn
SS
SS
SS
SS
SS
SS
SS
IW
PAL
str BR
SILTY CLAY
This core consists of homogenous, strong brown SILTY CLAY with manganese concretions.
XRD Samples: 1200A-1H-1, 0-1 cm, 9-10 cm, 18-19 cm, 31-32 cm, 66-67 cm, 81-82 cm, anf 105-106 cm

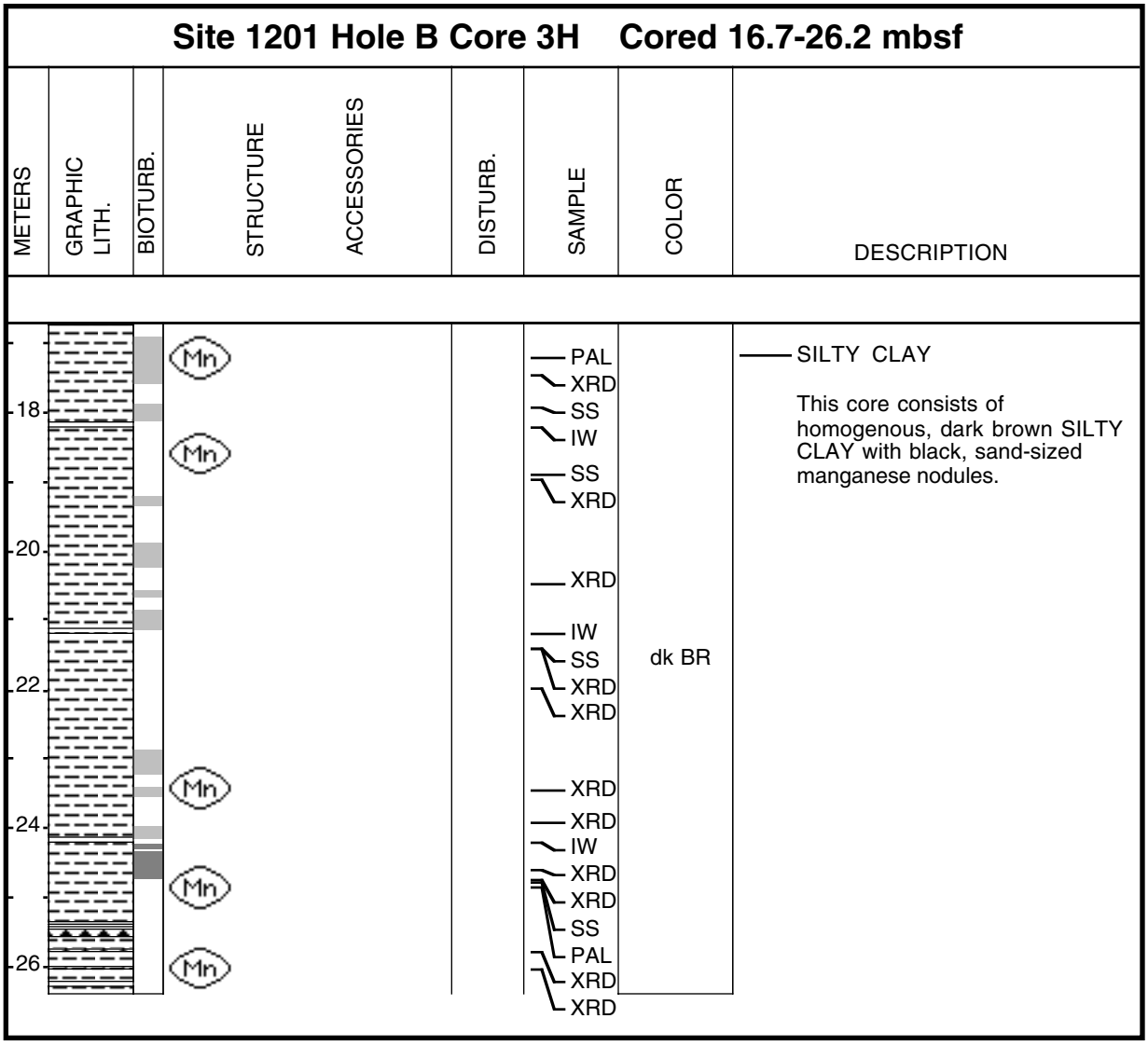
Core Photo


Site 1201 Hole B Core 1H Cored 0.0-7.2 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
2
4
6
Mn
XRD
SS
XRD
SS
IW
XRD
XRD
IW
XRD
IW
SS
XRD
PAL
str BR
SILTY CLAY
This core consists of homogenous, strong brown SILTY CLAY with manganese concretions.

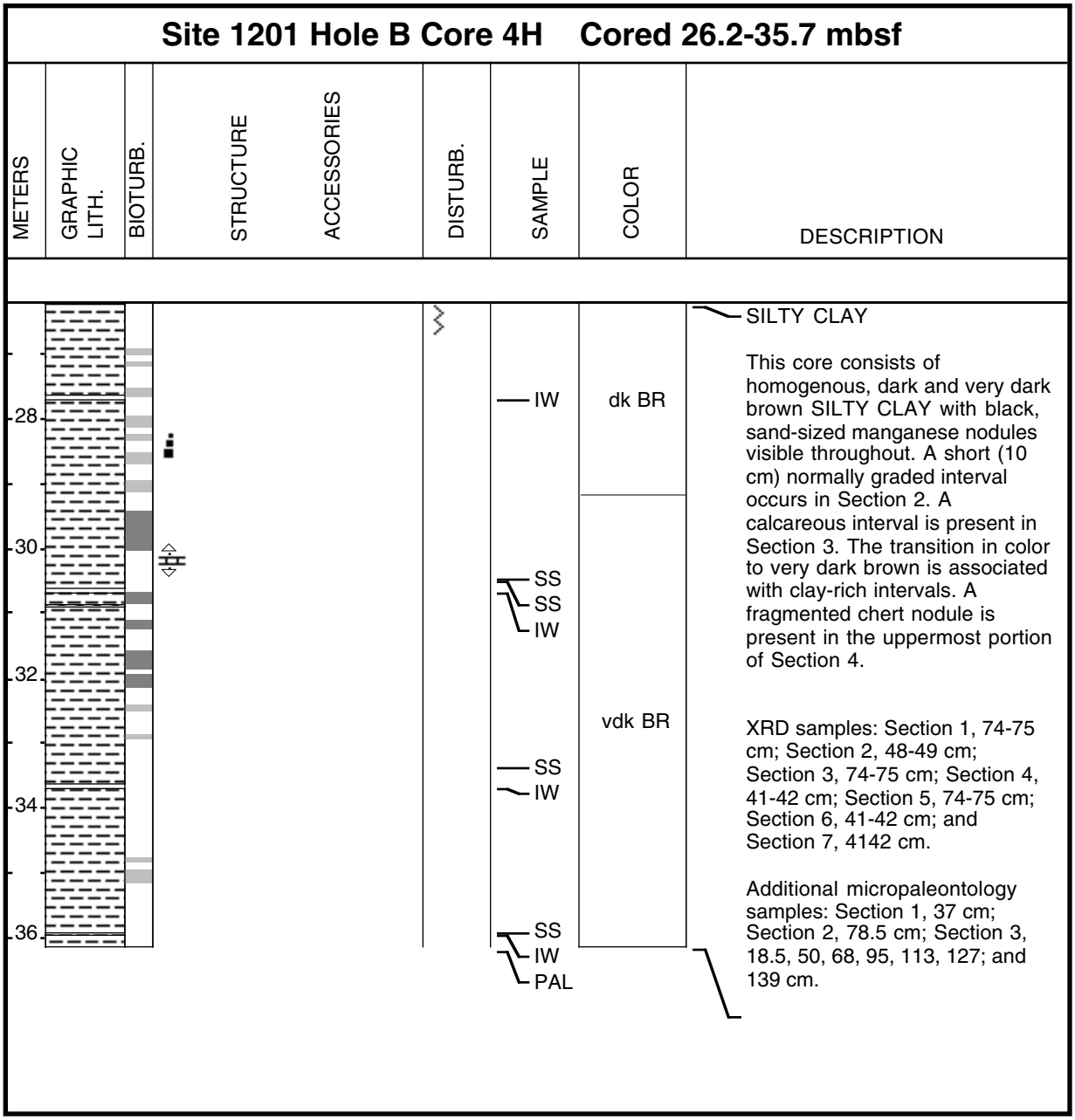
Core Photo


Site 1201 Hole B Core 2H Cored 7.2-16.7 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
8
10
12
14
16
Mn
SS
XRD
IW
PAL
str BR
SILTY CLAY
This core consists of homogenous, strong brown SILTY CLAY with sand-sized manganese concretions.

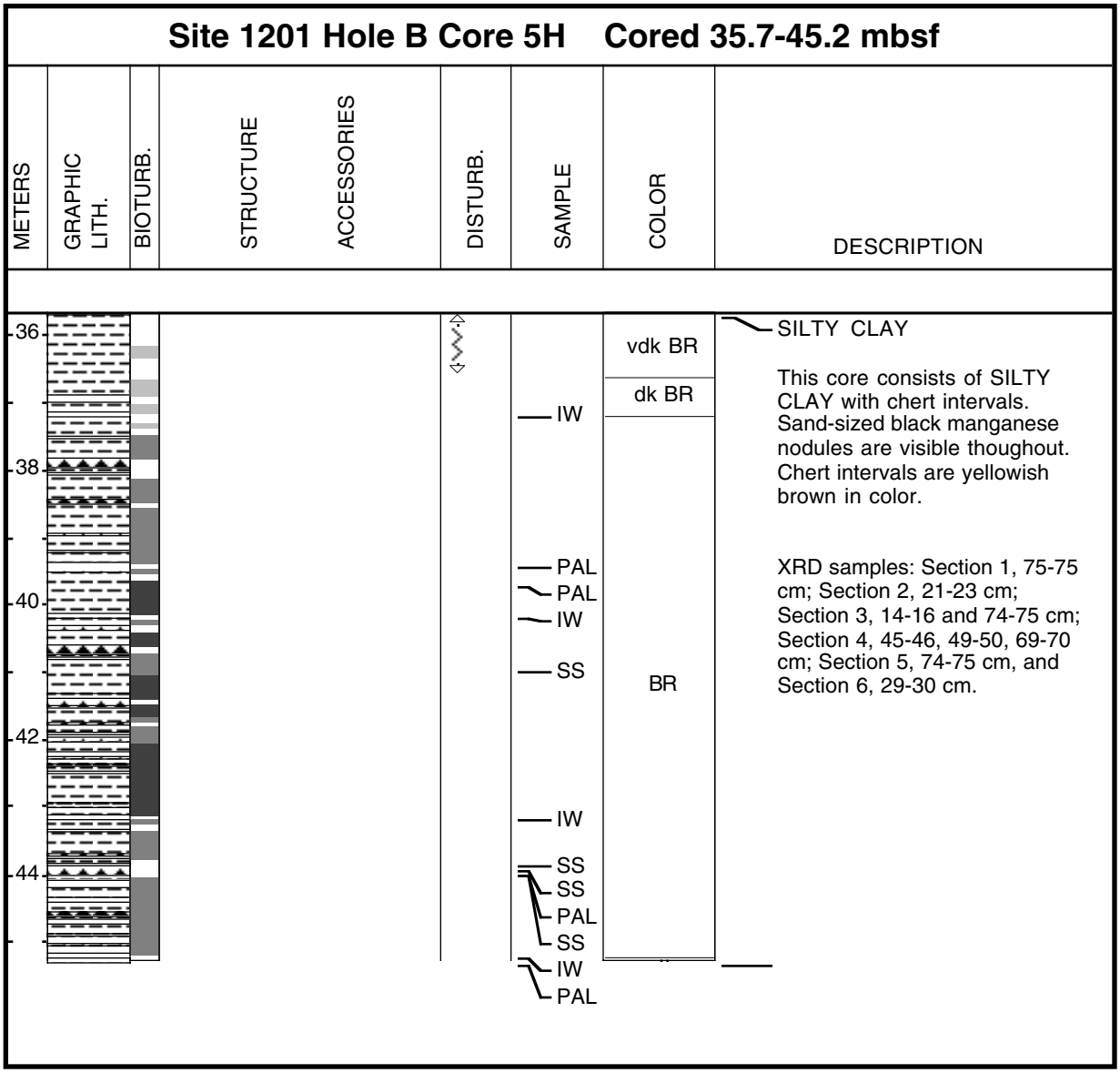
Core Photo


Site 1201 Hole B Core 3H Cored 16.7-26.2 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
18
20
22
24
26
Mn
PAL
XRD
SS
IW
dk BR
SILTY CLAY
This core consists of homogenous, dark brown SILTY CLAY with black, sand-sized manganese nodules.

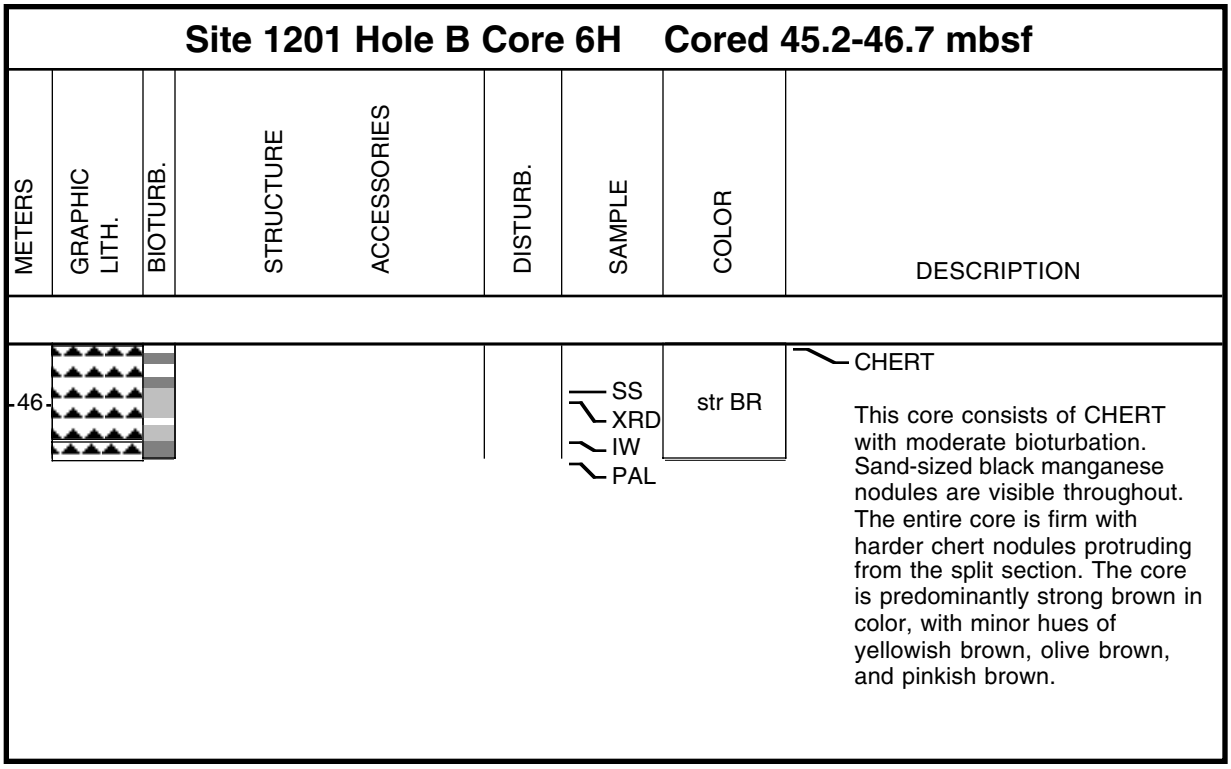
Core Photo


Site 1201 Hole B Core 4H Cored 26.2-35.7 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
28
30
32
34
36
IW
SS
SS
IW
SS
IW
SS
IW
PAL
dk BR
vdk BR
SILTY CLAY
This core consists of homogenous, dark and very dark brown SILTY CLAY with black, sand-sized manganese nodules visible throughout. A short (10 cm) normally graded interval occurs in Section 2. A calcareous interval is present in Section 3. The transition in color to very dark brown is associated with clay-rich intervals. A fragmented chert nodule is present in the uppermost portion of Section 4.
XRD samples: Section 1, 74-75 cm; Section 2, 48-49 cm; Section 3, 74-75 cm; Section 4, 41-42 cm; Section 5, 74-75 cm; Section 6, 41-42 cm; and Section 7, 4142 cm.
Additional micropaleontology samples: Section 1, 37 cm; Section 2, 78.5 cm; Section 3, 18.5, 50, 68, 95, 113, 127; and 139 cm.

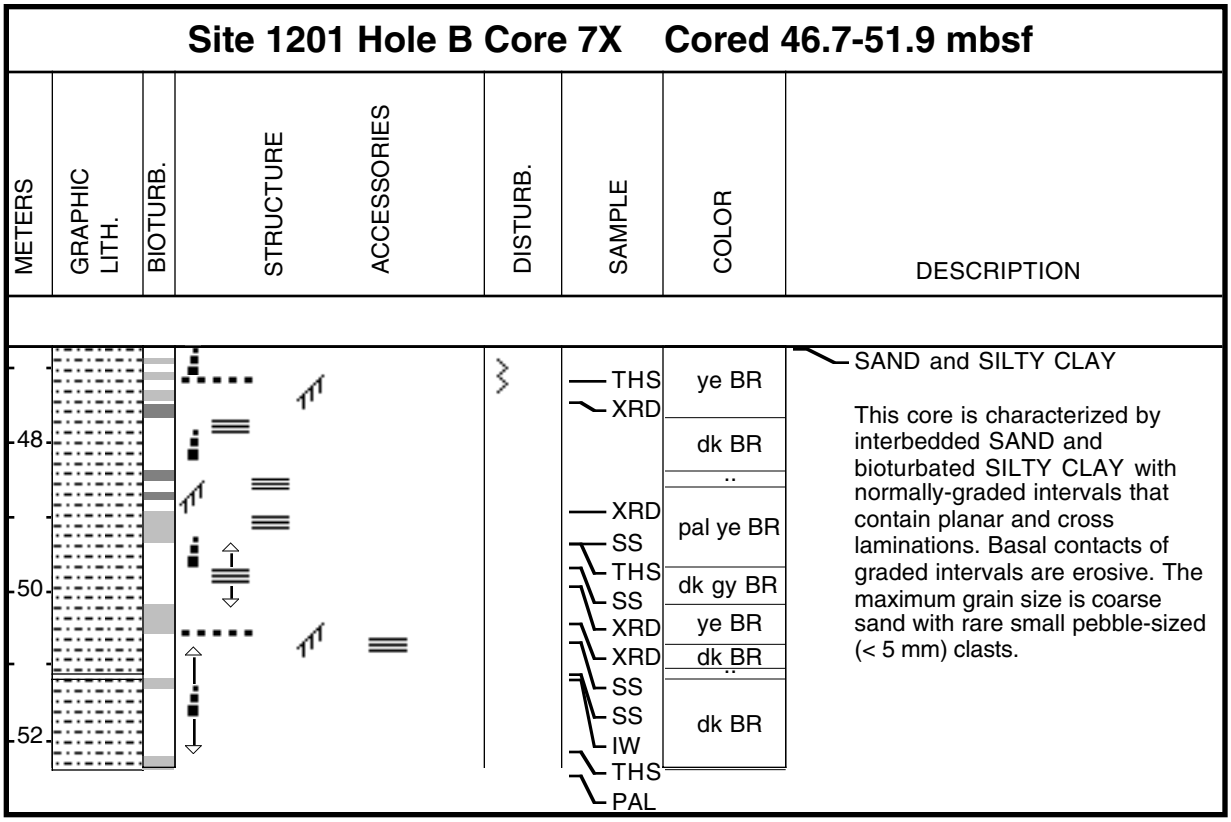
Core Photo


Site 1201 Hole B Core 5H Cored 35.7-45.2 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
36
38
40
42
44
IW
PAL
PAL
IW
SS
IW
SS
SS
PAL
SS
IW
PAL
vdk BR
dk BR
BR
SILTY CLAY
This core consists of SILTY CLAY with chert intervals. Sand-sized black manganese nodules are visible thoughout. Chert intervals are yellowish brown in color.
XRD samples: Section 1, 75-75 cm; Section 2, 21-23 cm; Section 3, 14-16 and 74-75 cm; Section 4, 45-46, 49-50, 69-70 cm; Section 5, 74-75 cm, and Section 6, 29-30 cm.

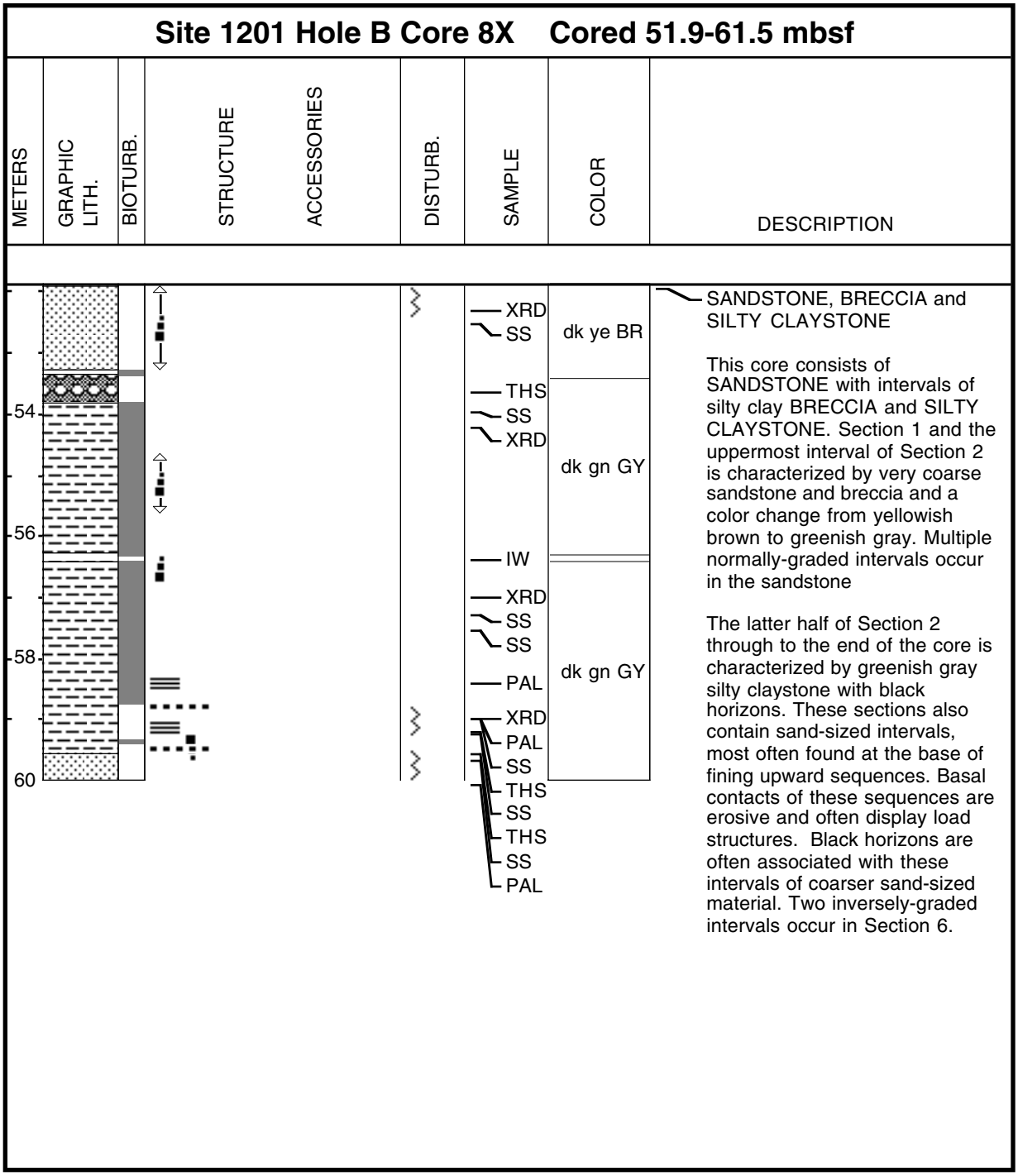
Core Photo


Site 1201 Hole B Core 6H Cored 45.2-46.7 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
46
SS
XRD
IW
PAL
str BR
CHERT
This core consists of CHERT with moderate bioturbation. Sand-sized black manganese nodules are visible throughout. The entire core is firm with harder chert nodules protruding from the split section. The core is predominantly strong brown in color, with minor hues of yellowish brown, olive brown, and pinkish brown.

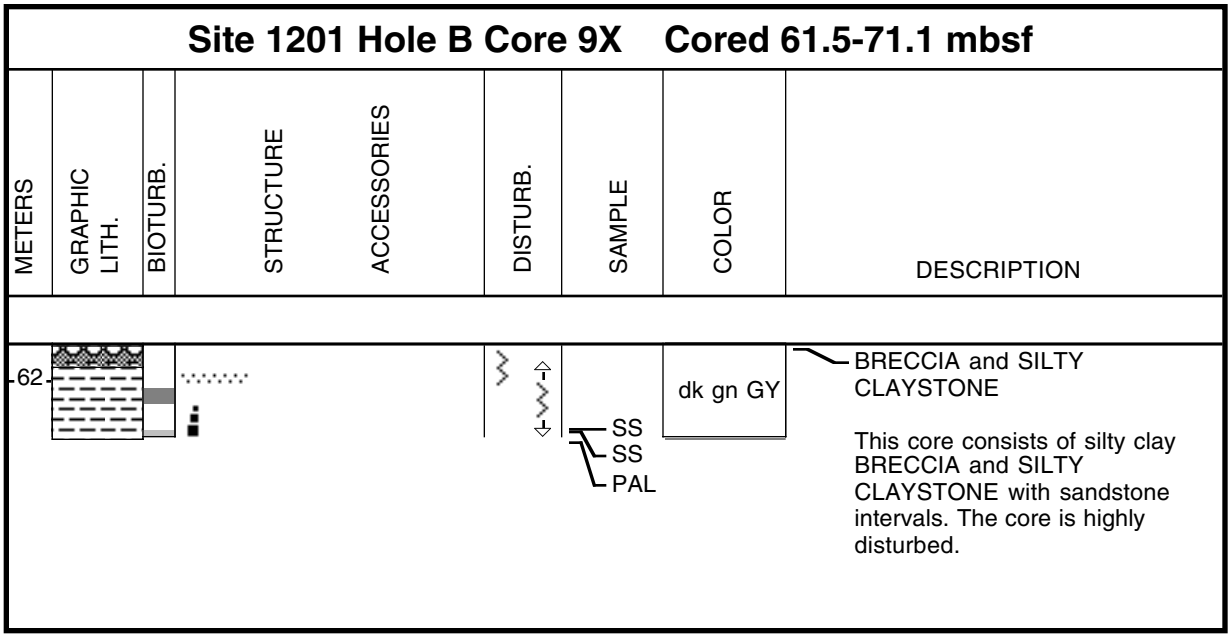
Core Photo


Site 1201 Hole B Core 7X Cored 46.7-51.9 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
48
50
52
THS
XRD
XRD
SS
THS
SS
XRD
XRD
SS
SS
IW
THS
PAL
ye BR
dk BR
pal ye BR
dk gy BR
ye BR
dk BR
dk BR
SAND and SILTY CLAY
This core is characterized by interbedded SAND and bioturbated SILTY CLAY with normally-graded intervals that contain planar and cross laminations. Basal contacts of graded intervals are erosive. The maximum grain size is coarse sand with rare small pebble-sized (< 5 mm) clasts.

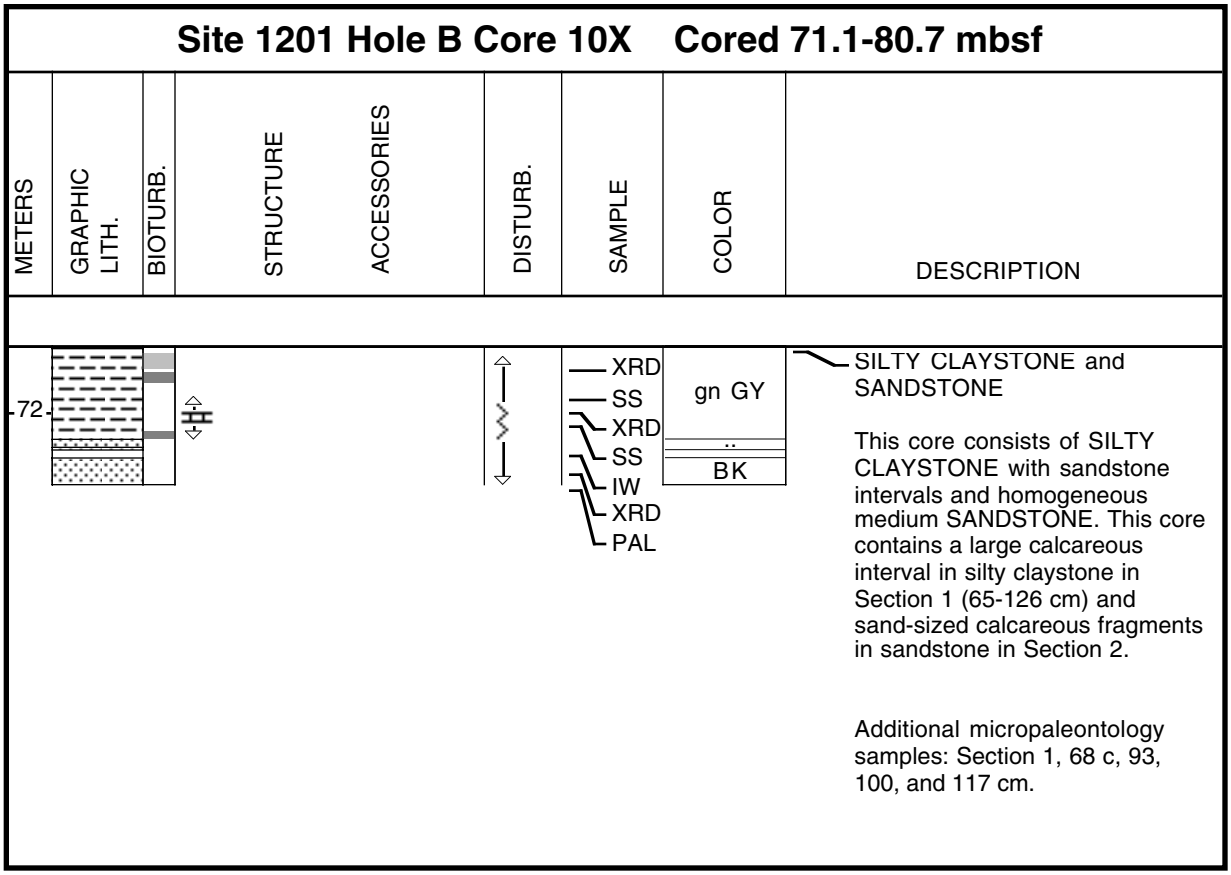
Core Photo


Site 1201 Hole B Core 8X Cored 51.9-61.5 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
54
56
58
60
XRD
SS
THS
SS
XRD
IW
XRD
SS
SS
PAL
XRD
PAL
SS
THS
SS
THS
SS
PAL
dk ye BR
dk gn GY
dk gn GY
SANDSTONE, BRECCIA and SILTY CLAYSTONE
This core consists of SANDSTONE with intervals of silty clay BRECCIA and SILTY CLAYSTONE. Section 1 and the uppermost interval of Section 2 is characterized by very coarse sandstone and breccia and a color change from yellowish brown to greenish gray. Multiple normally-graded intervals occur in the sandstone
The latter half of Section 2 through to the end of the core is characterized by greenish gray silty claystone with black horizons. These sections also contain sand-sized intervals, most often found at the base of fining upward sequences. Basal contacts of these sequences are erosive and often display load structures. Black horizons are often associated with these intervals of coarser sand-sized material. Two inversely-graded intervals occur in Section 6.

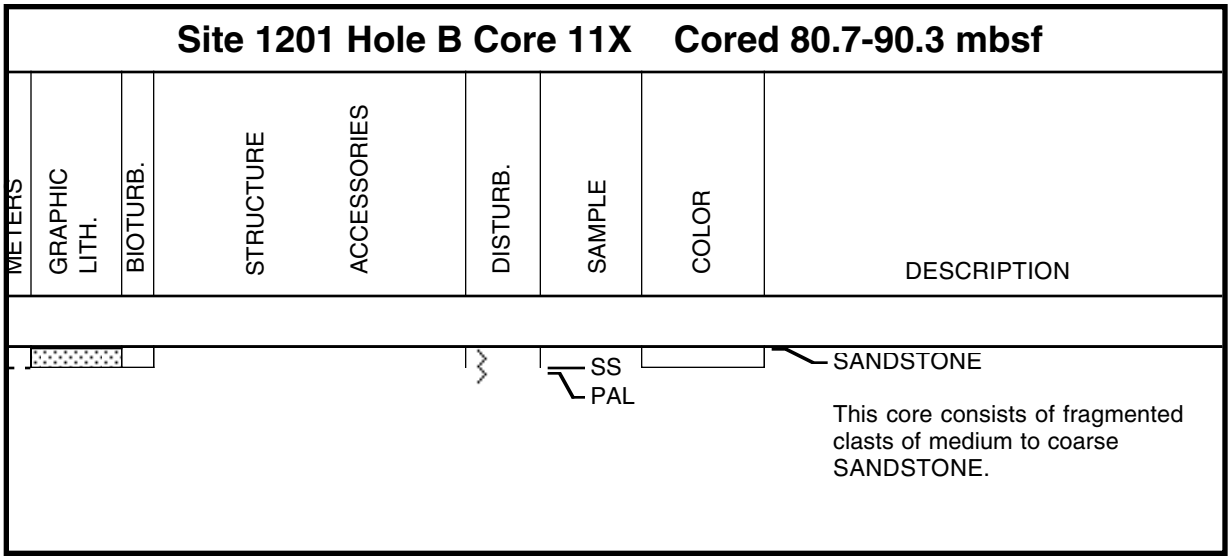
Core Photo


Site 1201 Hole B Core 9X Cored 61.5-71.1 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
62
SS
SS
PAL
dk gn GY
BRECCIA and SILTY CLAYSTONE
This core consists of silty clay BRECCIA and SILTY CLAYSTONE with sandstone intervals. The core is highly disturbed.

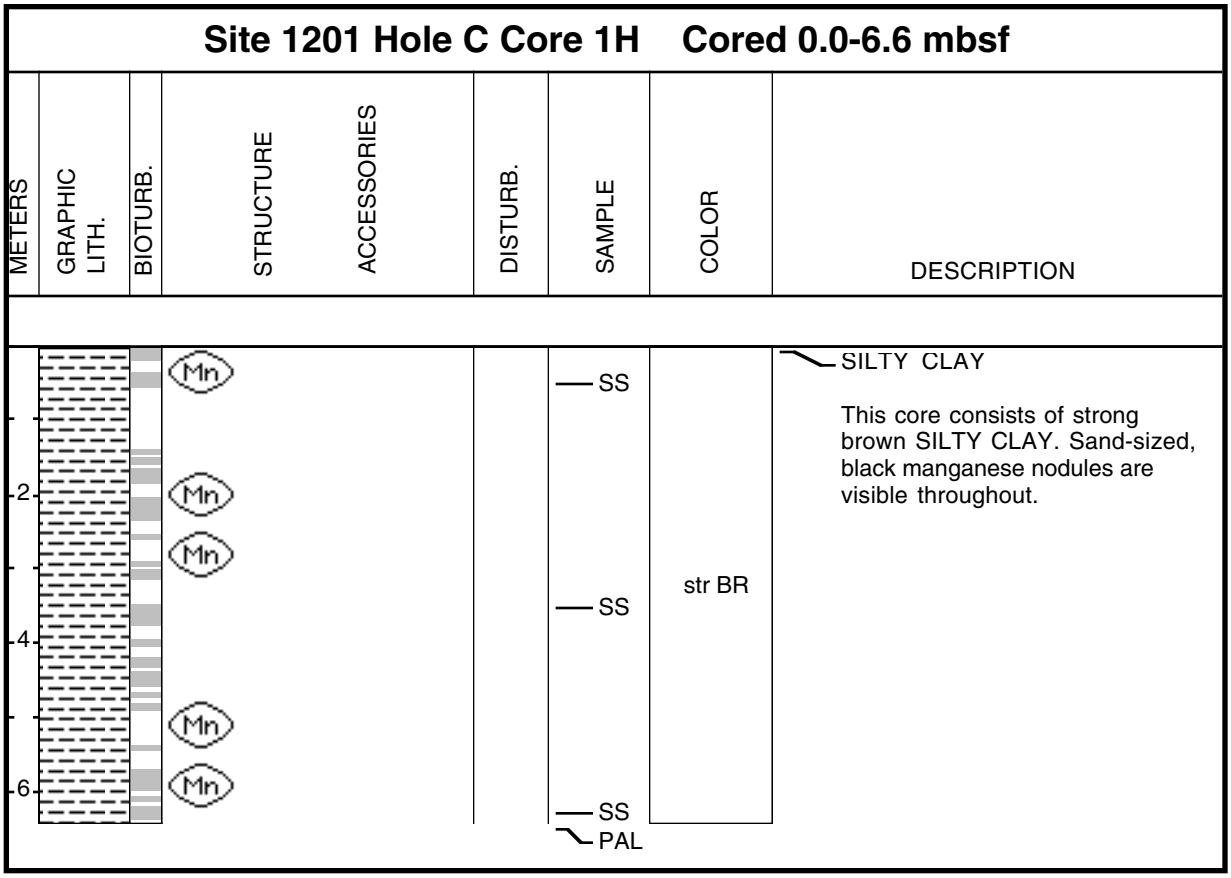
Core Photo


Site 1201 Hole B Core 10X Cored 71.1-80.7 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
72
XRD
SS
XRD
SS
IW
XRD
PAL
gn GY
BK
SILTY CLAYSTONE and SANDSTONE
This core consists of SILTY CLAYSTONE with sandstone intervals and homogeneous medium SANDSTONE. This core contains a large calcareous interval in silty claystone in Section 1 (65-126 cm) and sand-sized calcareous fragments in sandstone in Section 2.
Additional micropaleontology samples: Section 1, 68 c, 93, 100, and 117 cm.

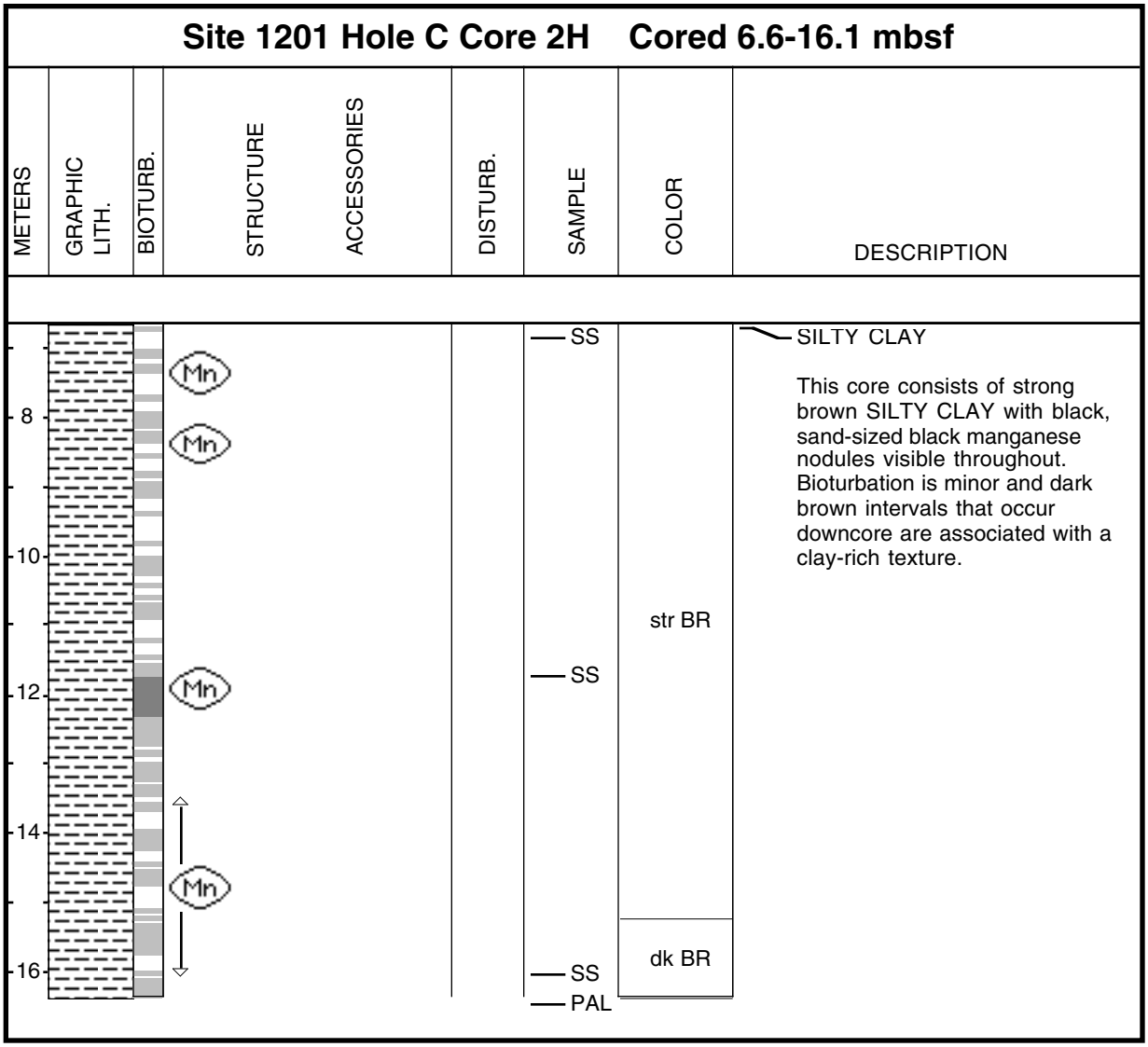
Core Photo


Site 1201 Hole B Core 11X Cored 80.7-90.3 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
SS
PAL
SANDSTONE
This core consists of fragmented clasts of medium to coarse SANDSTONE.

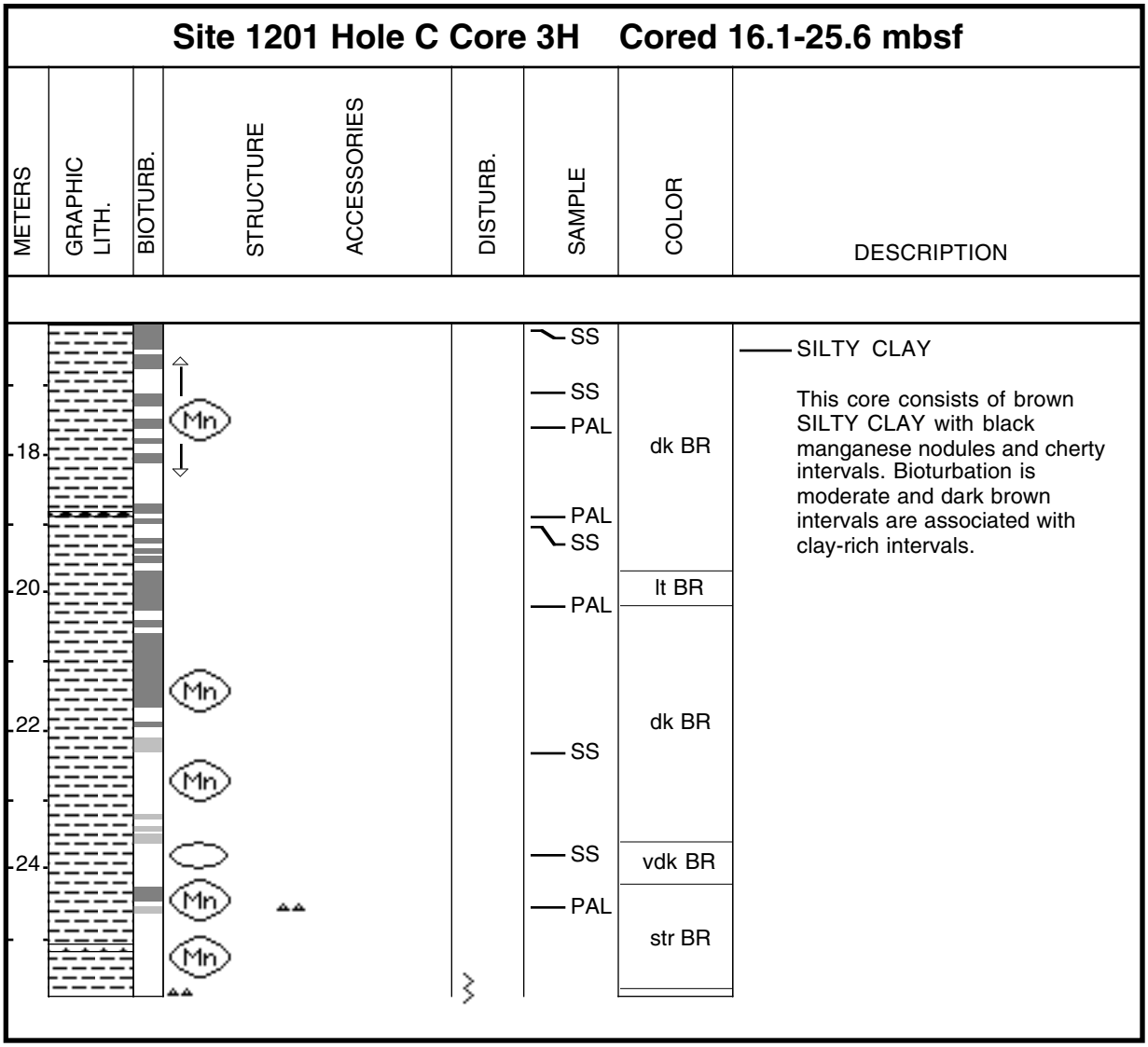
Core Photo


Site 1201 Hole C Core 1H Cored 0.0-6.6 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
2
4
6
Mn
Mn
Mn
Mn
Mn
SS
SS
SS
PAL
str BR
SILTY CLAY
This core consists of strong brown SILTY CLAY. Sand-sized, black manganese nodules are visible throughout.

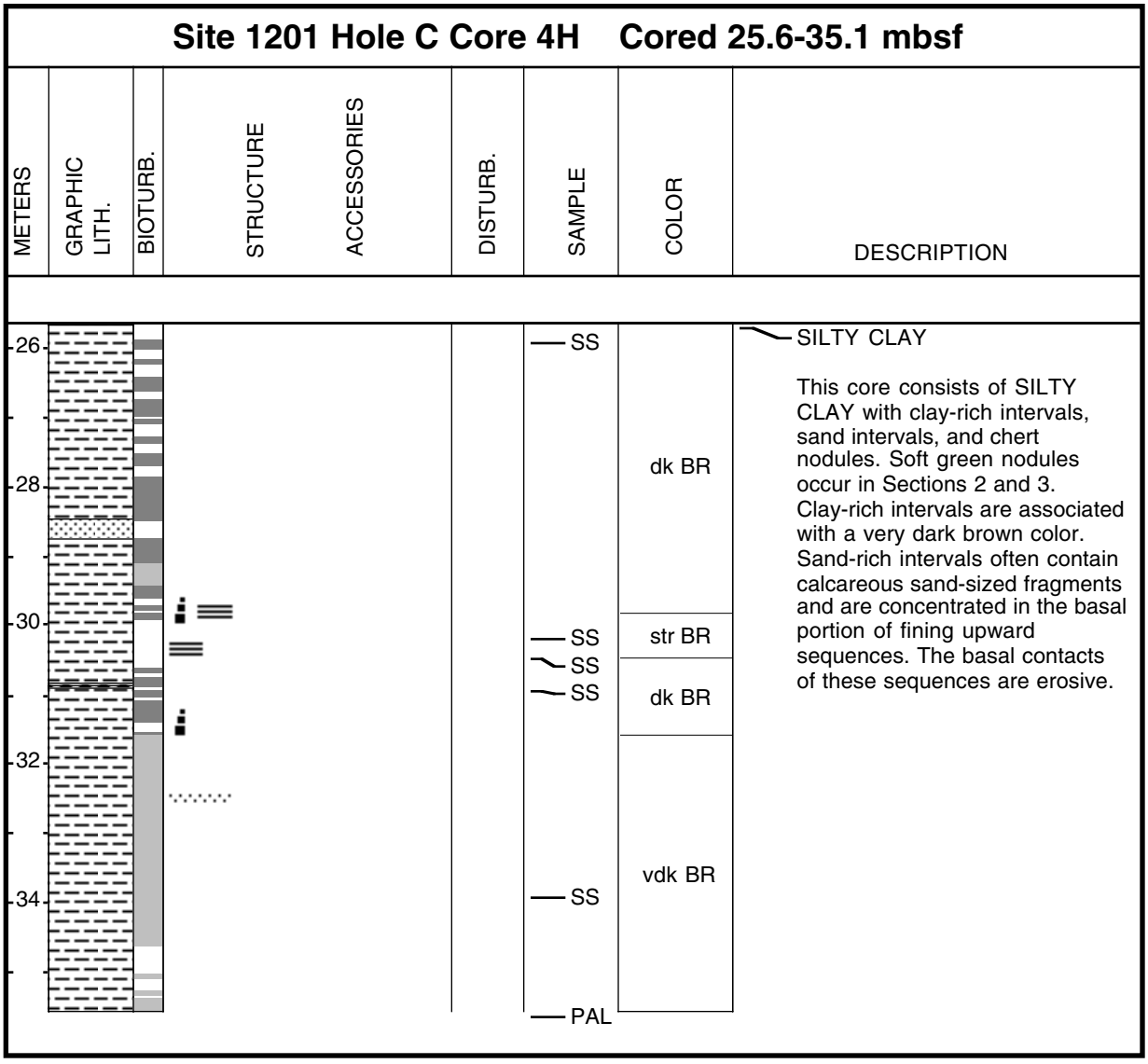
Core Photo


Site 1201 Hole C Core 2H Cored 6.6-16.1 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
8
10
12
14
16
Mn
Mn
Mn
Mn
SS
SS
SS
PAL
str BR
dk BR
SILTY CLAY
This core consists of strong brown SILTY CLAY with black, sand-sized black manganese nodules visible throughout. Bioturbation is minor and dark brown intervals that occur downcore are associated with a clay-rich texture.

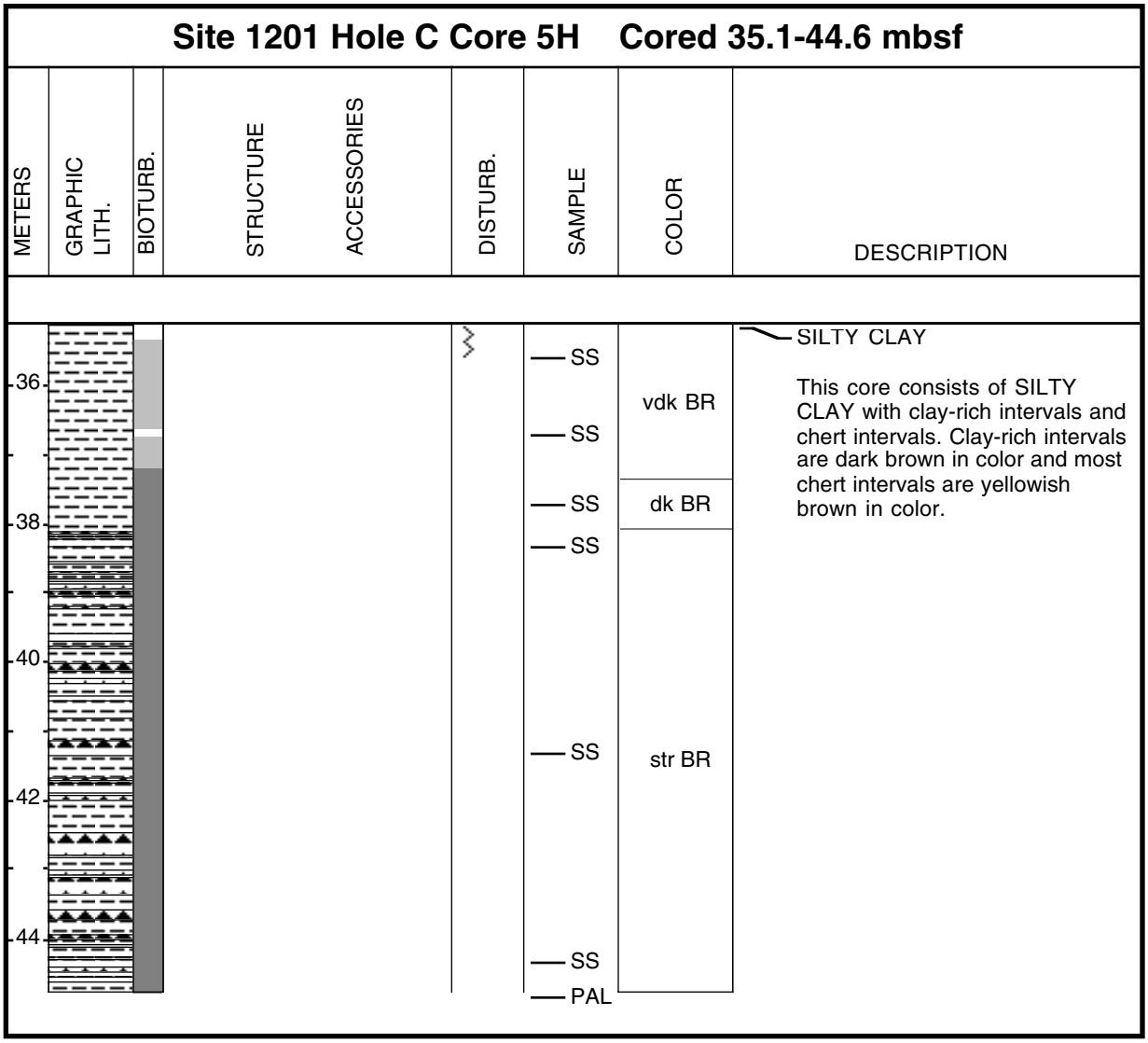
Core Photo


Site 1201 Hole C Core 3H Cored 16.1-25.6 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
18
20
22
24
Mn
SS
PAL
dk BR
lt BR
vdk BR
str BR
SILTY CLAY
This core consists of brown SILTY CLAY with black manganese nodules and cherty intervals. Bioturbation is moderate and dark brown intervals are associated with clay-rich intervals.

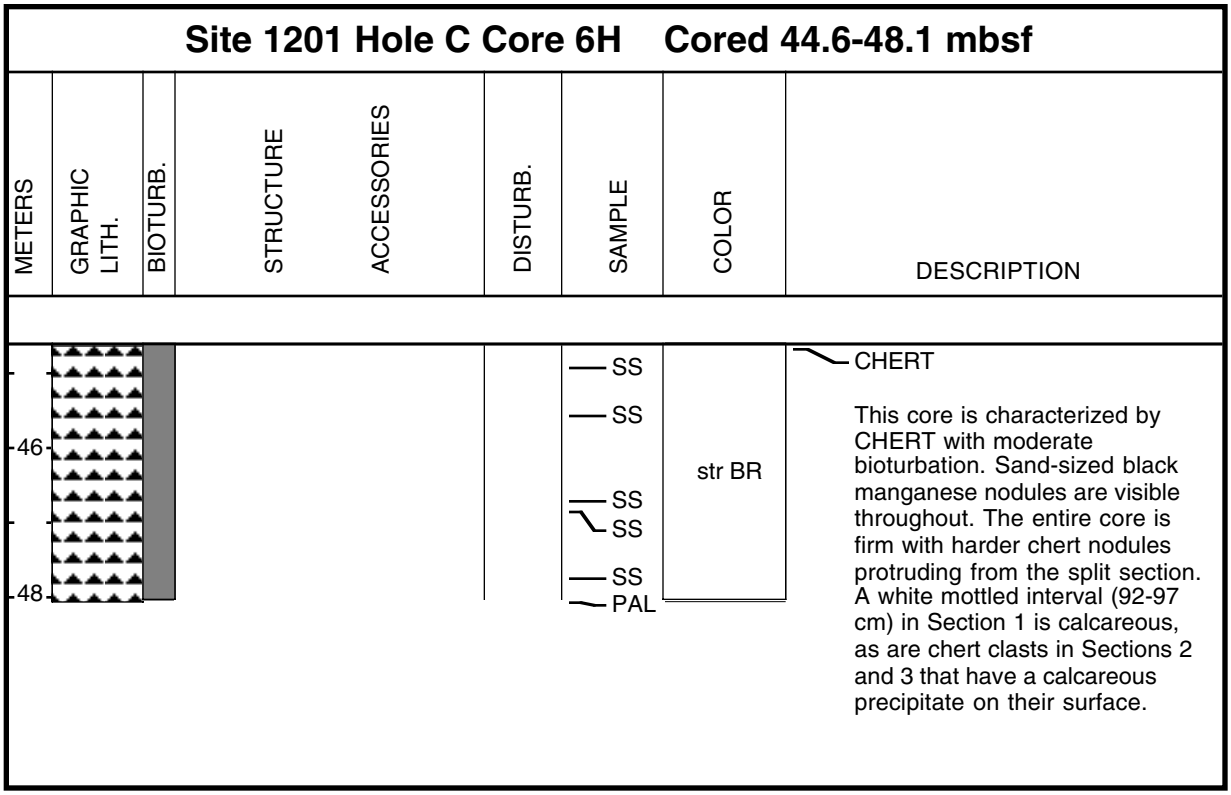
Core Photo


Site 1201 Hole C Core 4H Cored 25.6-35.1 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
26
28
30
32
34
SS
SS
SS
SS
SS
PAL
dk BR
str BR
dk BR
vdk BR
SILTY CLAY
This core consists of SILTY CLAY with clay-rich intervals, sand intervals, and chert nodules. Soft green nodules occur in Sections 2 and 3. Clay-rich intervals are associated with a very dark brown color. Sand-rich intervals often contain calcareous sand-sized fragments and are concentrated in the basal portion of fining upward sequences. The basal contacts of these sequences are erosive.

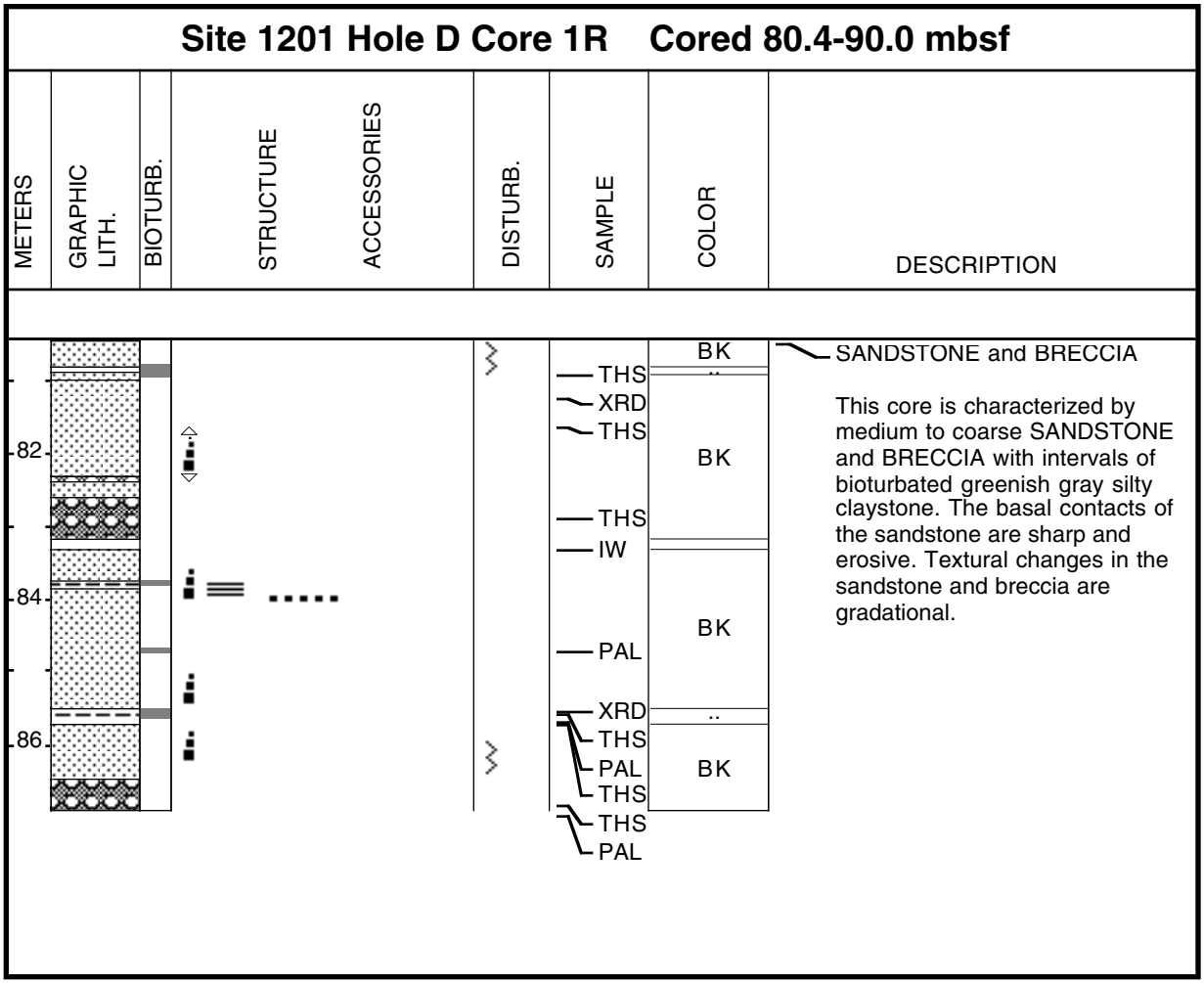
Core Photo


Site 1201 Hole C Core 5H Cored 35.1-44.6 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
36
38
40
42
44
SS
SS
SS
SS
SS
SS
PAL
vdk BR
dk BR
str BR
SILTY CLAY
This core consists of SILTY CLAY with clay-rich intervals and chert intervals. Clay-rich intervals are dark brown in color and most chert intervals are yellowish brown in color.

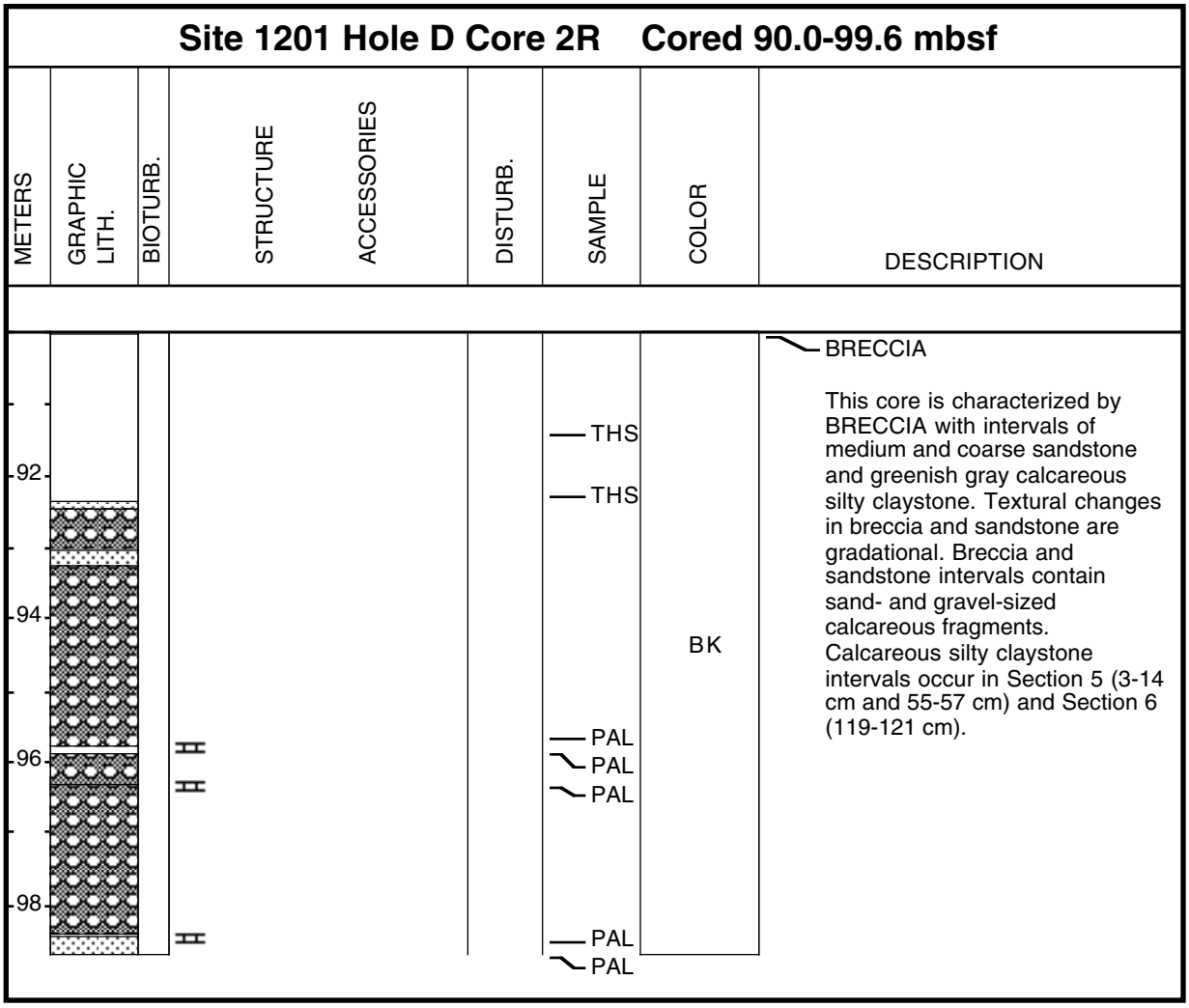
Core Photo


Site 1201 Hole C Core 6H Cored 44.6-48.1 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
46
48
SS
SS
SS
SS
SS
PAL
str BR
CHERT
This core is characterized by CHERT with moderate bioturbation. Sand-sized black manganese nodules are visible throughout. The entire core is firm with harder chert nodules protruding from the split section. A white mottled interval (92-97 cm) in Section 1 is calcareous, as are chert clasts in Sections 2 and 3 that have a calcareous precipitate on their surface.

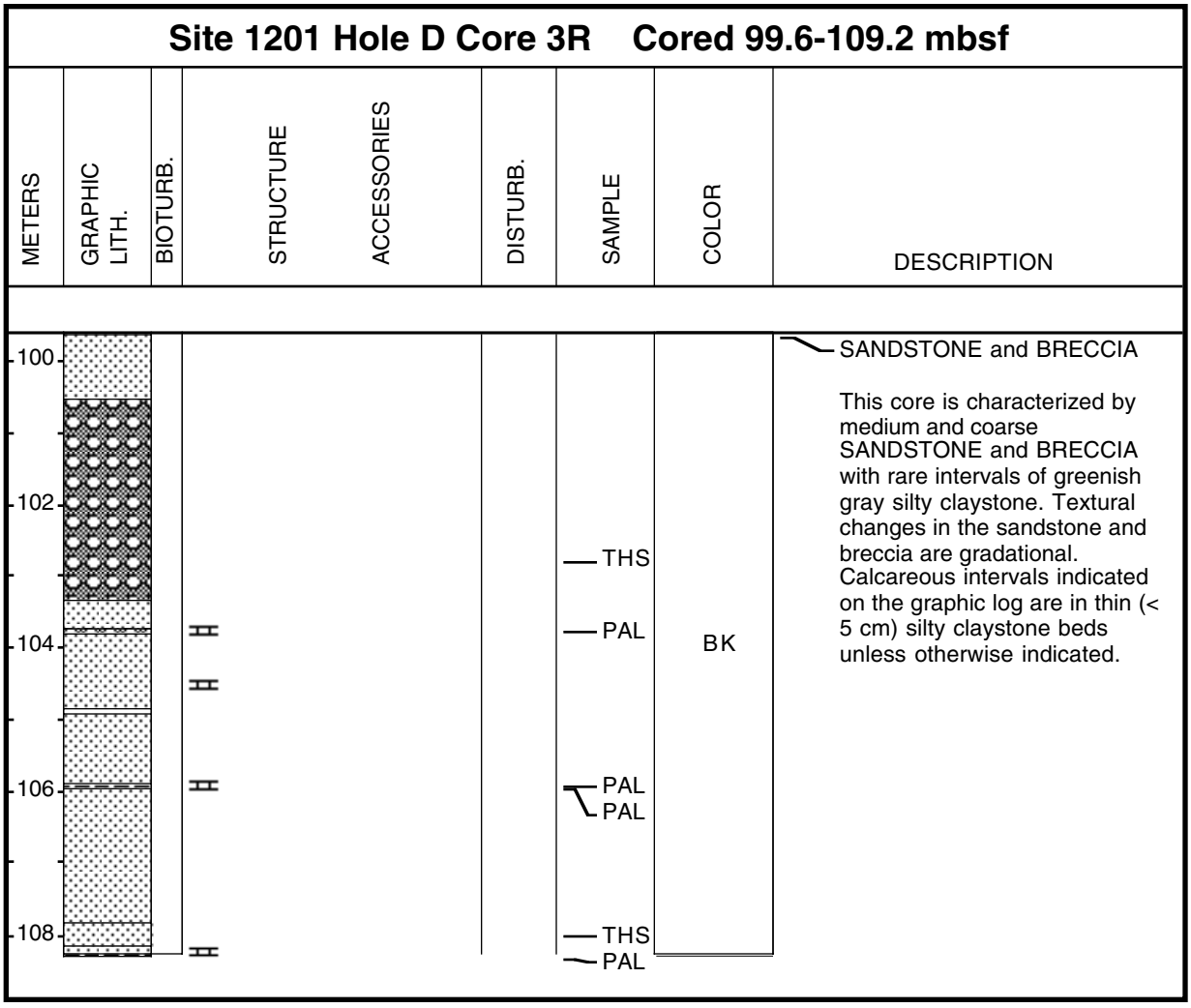
Core Photo


Site 1201 Hole D Core 1R Cored 80.4-90.0 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
82
84
86
THS
XRD
THS
THS
IW
PAL
XRD
THS
PAL
THS
THS
PAL
BK
BK
BK
BK
SANDSTONE and BRECCIA
This core is characterized by medium to coarse SANDSTONE and BRECCIA with intervals of bioturbated greenish gray silty claystone. The basal contacts of the sandstone are sharp and erosive. Textural changes in the sandstone and breccia are gradational.

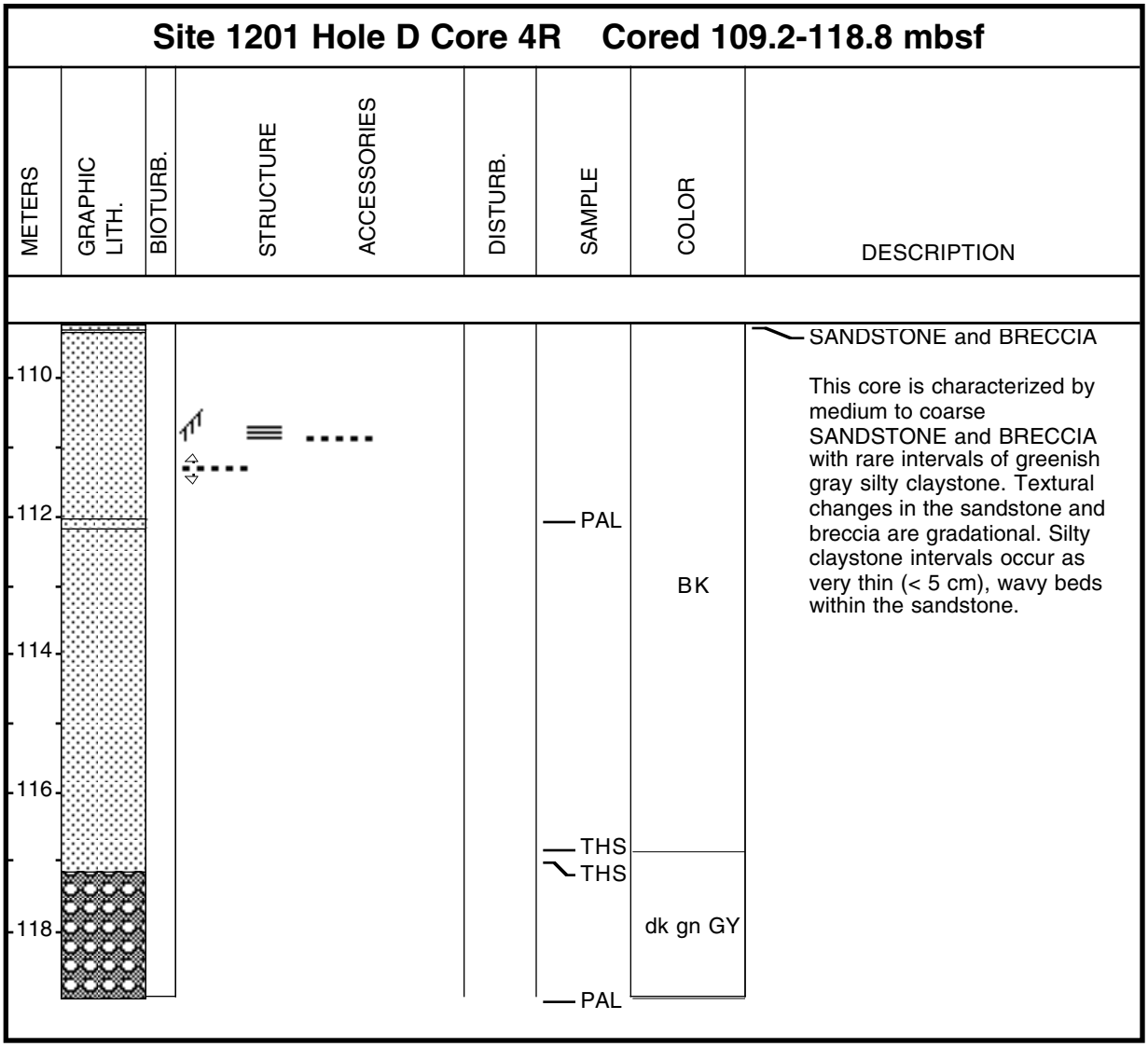
Core Photo


Site 1201 Hole D Core 2R Cored 90.0-99.6 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
92
94
96
98
THS
THS
PAL
PAL
PAL
PAL
PAL
BK
BRECCIA
This core is characterized by BRECCIA with intervals of medium and coarse sandstone and greenish gray calcareous silty claystone. Textural changes in breccia and sandstone are gradational. Breccia and sandstone intervals contain sand- and gravel-sized calcareous fragments. Calcareous silty claystone intervals occur in Section 5 (3-14 cm and 55-57 cm) and Section 6 (119-121 cm).

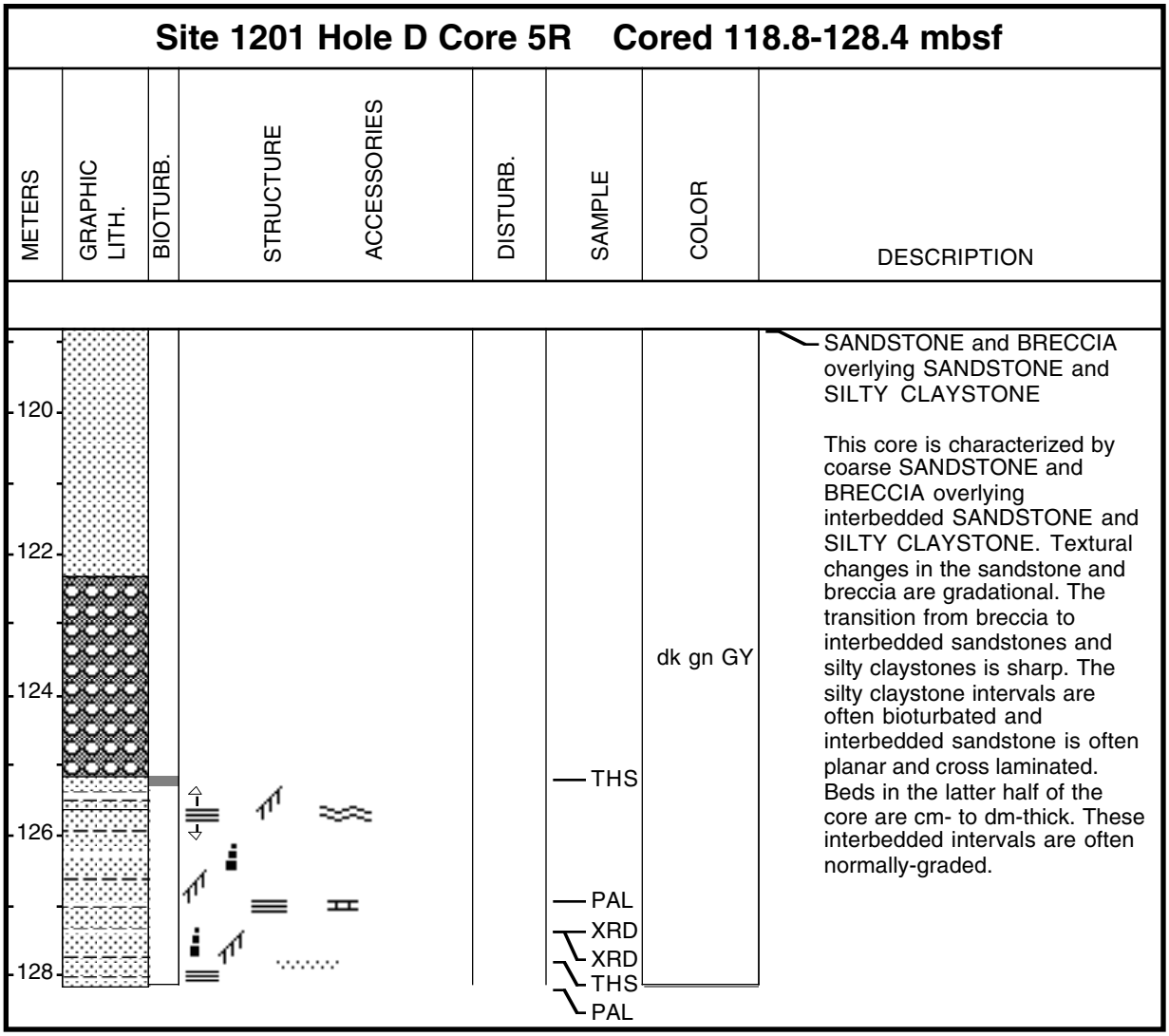
Core Photo


Site 1201 Hole D Core 3R Cored 99.6-109.2 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
100
102
104
106
108
THS
PAL
PAL
PAL
THS
PAL
BK
SANDSTONE and BRECCIA
This core is characterized by medium and coarse SANDSTONE and BRECCIA with rare intervals of greenish gray silty claystone. Textural changes in the sandstone and breccia are gradational. Calcareous intervals indicated on the graphic log are in thin (< 5 cm) silty claystone beds unless otherwise indicated.

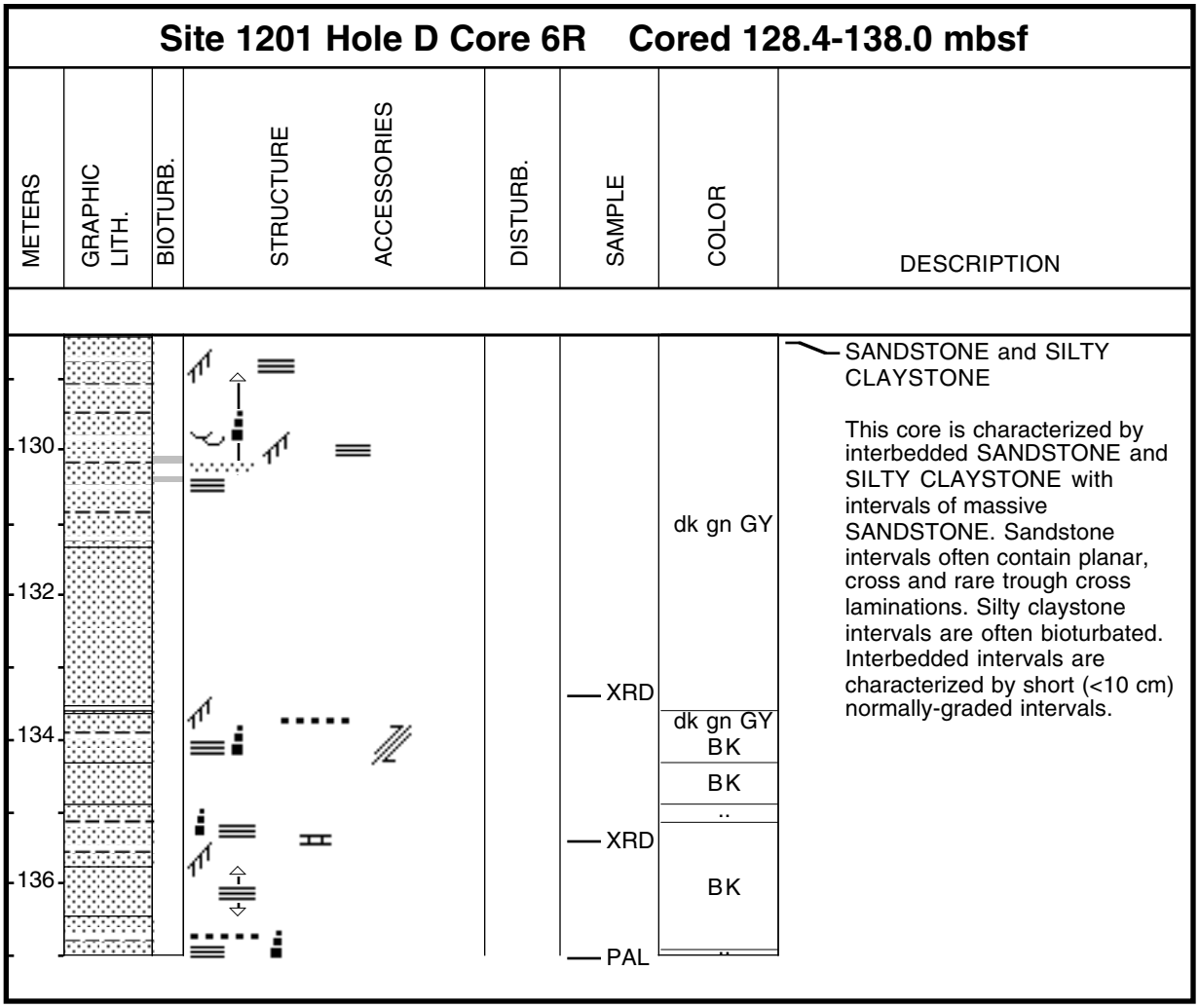
Core Photo


Site 1201 Hole D Core 4R Cored 109.2-118.8 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
110
112
114
116
118
PAL
THS
THS
PAL
BK
dk gn GY
SANDSTONE and BRECCIA
This core is characterized by medium to coarse SANDSTONE and BRECCIA with rare intervals of greenish gray silty claystone. Textural changes in the sandstone and breccia are gradational. Silty claystone intervals occur as very thin (< 5 cm), wavy beds within the sandstone.

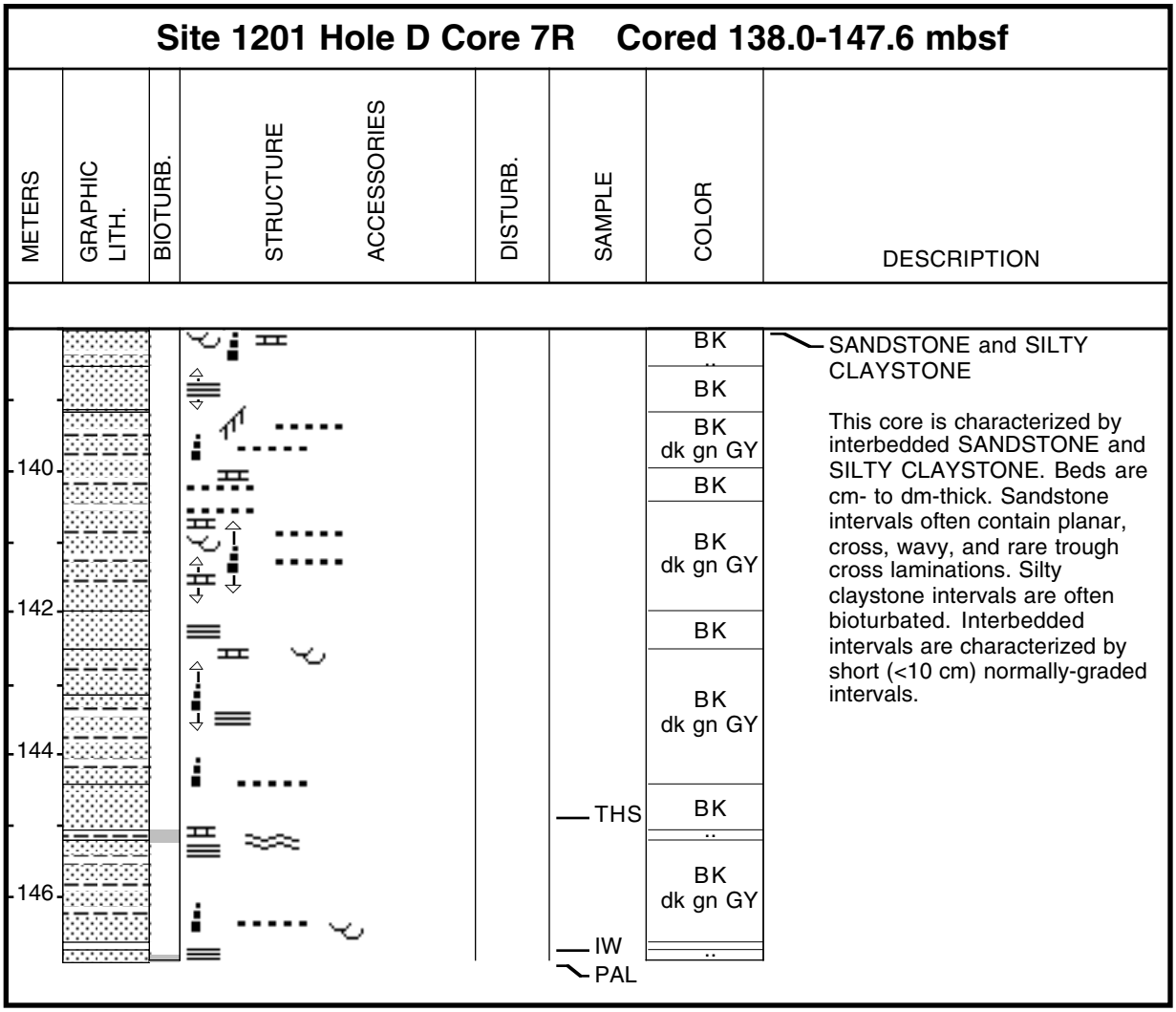
Core Photo


Site 1201 Hole D Core 5R Cored 118.8-128.4 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
120
122
124
126
128
THS
PAL
XRD
XRD
THS
PAL
dk gn GY
SANDSTONE and BRECCIA overlying SANDSTONE and SILTY CLAYSTONE
This core is characterized by coarse SANDSTONE and BRECCIA overlying interbedded SANDSTONE and SILTY CLAYSTONE. Textural changes in the sandstone and breccia are gradational. The transition from breccia to interbedded sandstones and silty claystones is sharp. The silty claystone intervals are often bioturbated and interbedded sandstone is often planar and cross laminated. Beds in the latter half of the core are cm- to dm-thick. These interbedded intervals are often normally-graded.

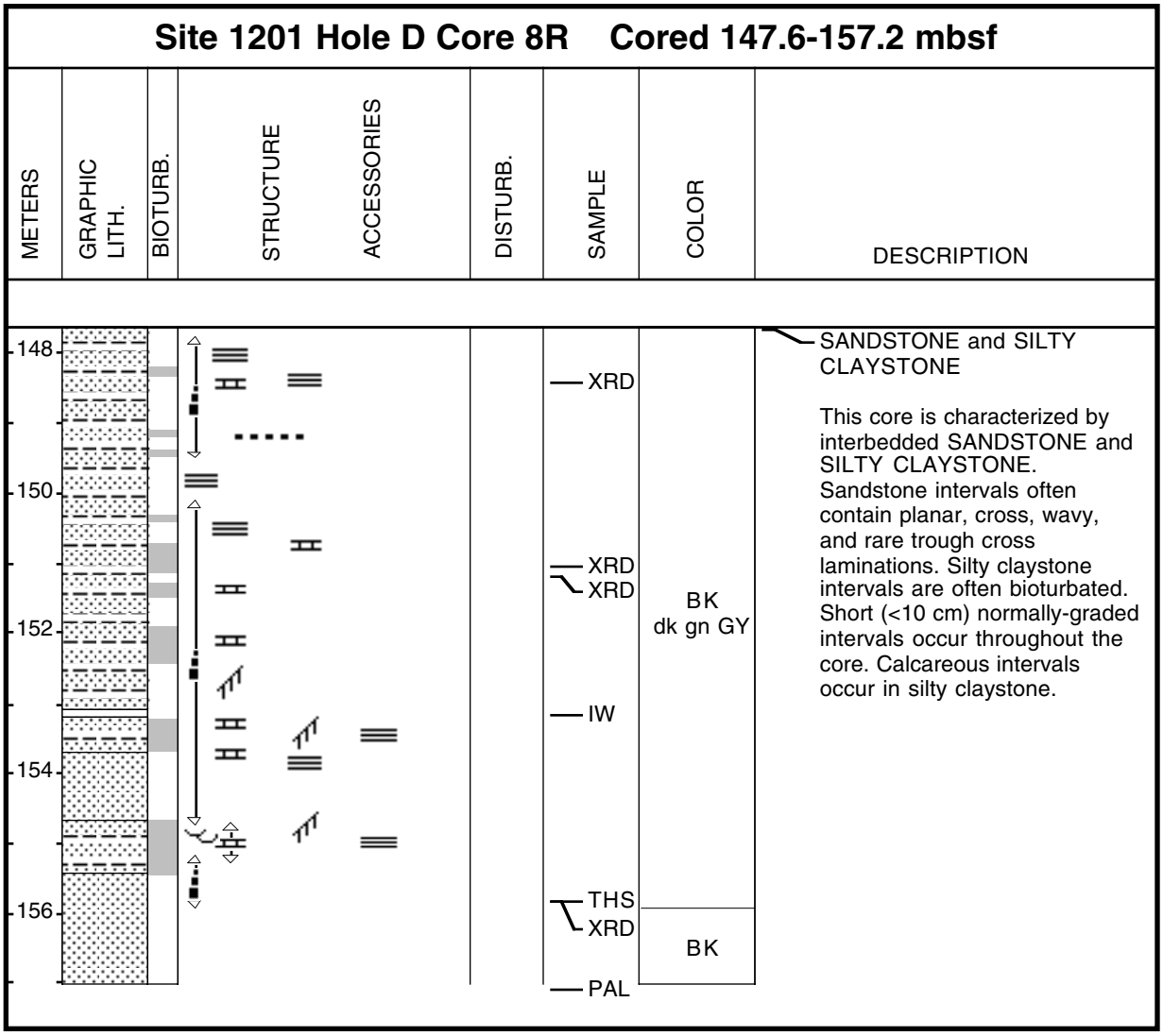
Core Photo


Site 1201 Hole D Core 6R Cored 128.4-138.0 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
130
132
134
136
XRD
XRD
PAL
dk gn GY
dk gn GY
BK
BK
BK
SANDSTONE and SILTY CLAYSTONE
This core is characterized by interbedded SANDSTONE and SILTY CLAYSTONE with intervals of massive SANDSTONE. Sandstone intervals often contain planar, cross and rare trough cross laminations. Silty claystone intervals are often bioturbated. Interbedded intervals are characterized by short (<10 cm) normally-graded intervals.

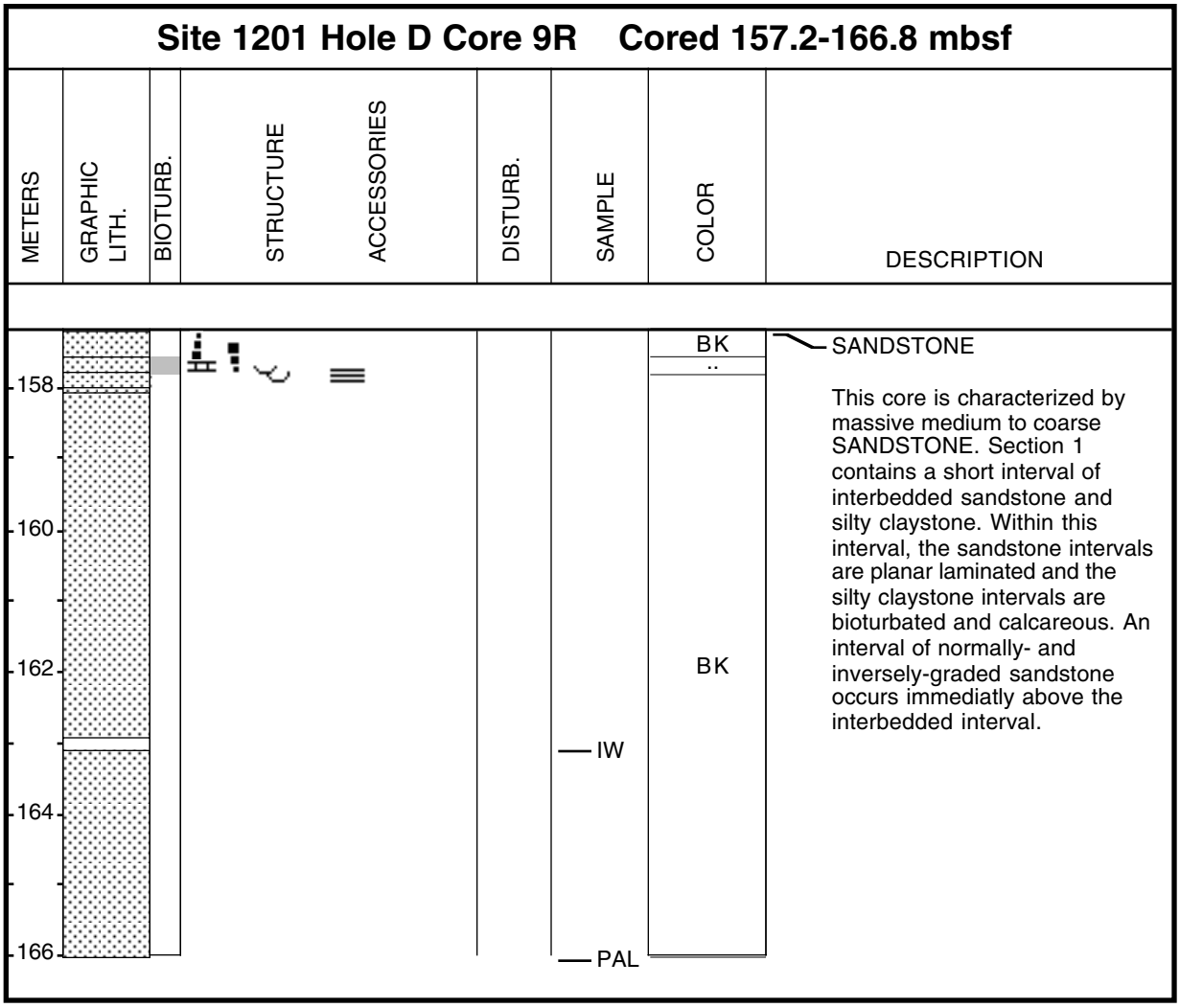
Core Photo


Site 1201 Hole D Core 7R Cored 138.0-147.6 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
140
142
144
146
THS
IW
PAL
BK
BK
BK
dk gn GY
BK
BK
dk gn GY
BK
BK
dk gn GY
BK
BK
dk gn GY
SANDSTONE and SILTY CLAYSTONE
This core is characterized by interbedded SANDSTONE and SILTY CLAYSTONE. Beds are cm- to dm-thick. Sandstone intervals often contain planar, cross, wavy, and rare trough cross laminations. Silty claystone intervals are often bioturbated. Interbedded intervals are characterized by short (<10 cm) normally-graded intervals.

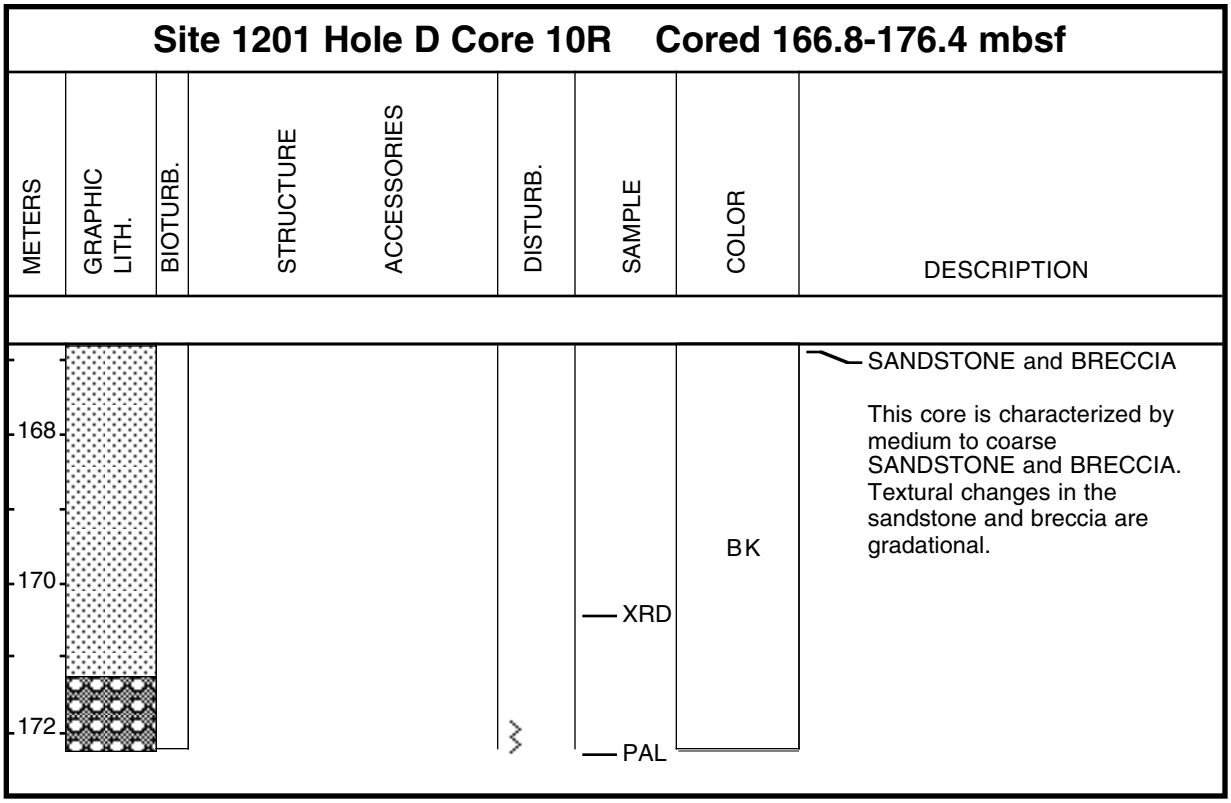
Core Photo


Site 1201 Hole D Core 8R Cored 147.6-157.2 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
148
150
152
154
156
XRD
XRD
XRD
IW
THS
XRD
PAL
BK
dk gn GY
BK
SANDSTONE and SILTY CLAYSTONE
This core is characterized by interbedded SANDSTONE and SILTY CLAYSTONE. Sandstone intervals often contain planar, cross, wavy, and rare trough cross laminations. Silty claystone intervals are often bioturbated. Short (<10 cm) normally-graded intervals occur throughout the core. Calcareous intervals occur in silty claystone.

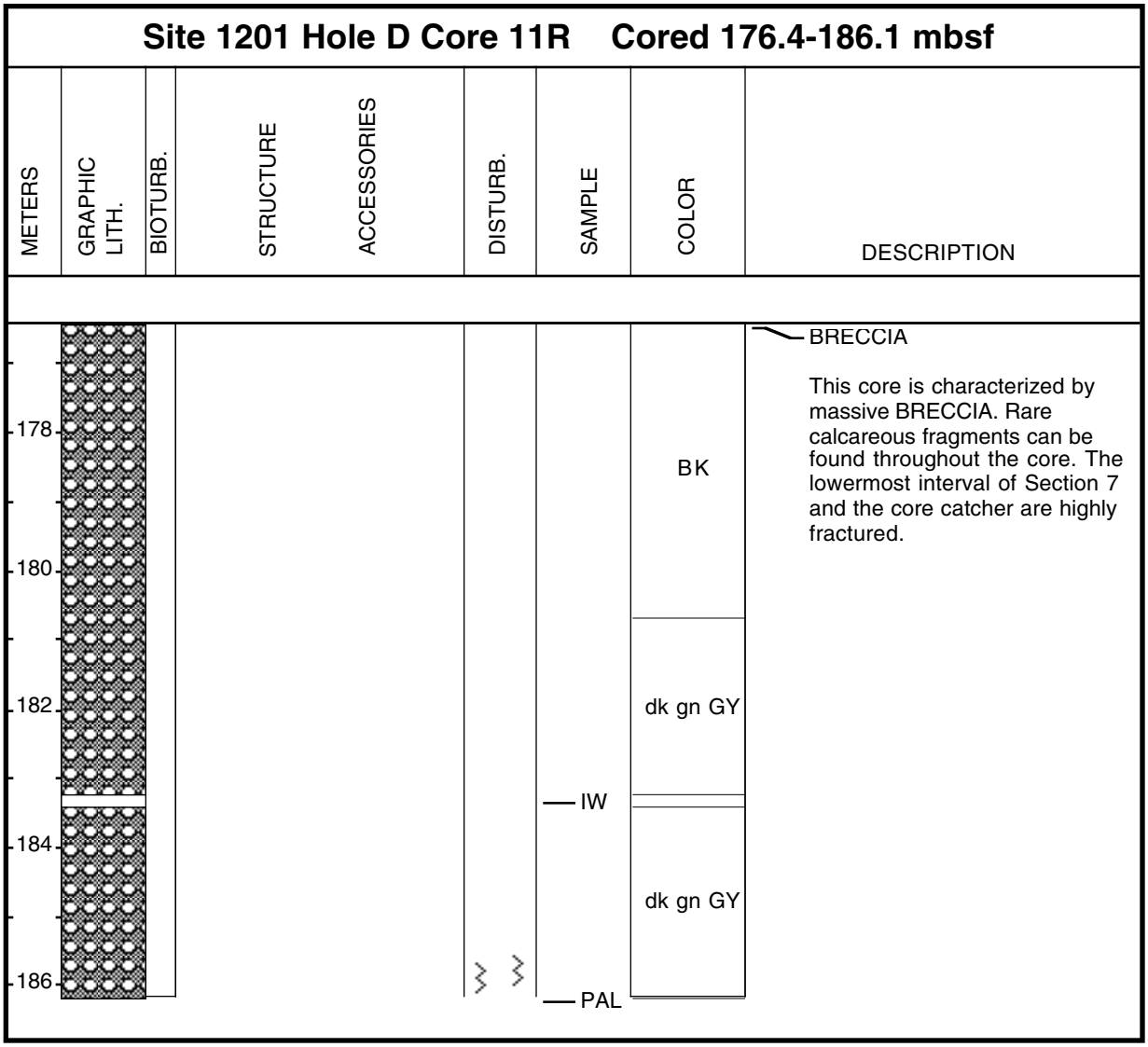
Core Photo


Site 1201 Hole D Core 9R Cored 157.2-166.8 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
158
160
162
164
166
BK
BK
IW
PAL
SANDSTONE
This core is characterized by massive medium to coarse SANDSTONE. Section 1 contains a short interval of interbedded sandstone and silty claystone. Within this interval, the sandstone intervals are planar laminated and the silty claystone intervals are bioturbated and calcareous. An interval of normally- and inversely-graded sandstone occurs immediatly above the interbedded interval.

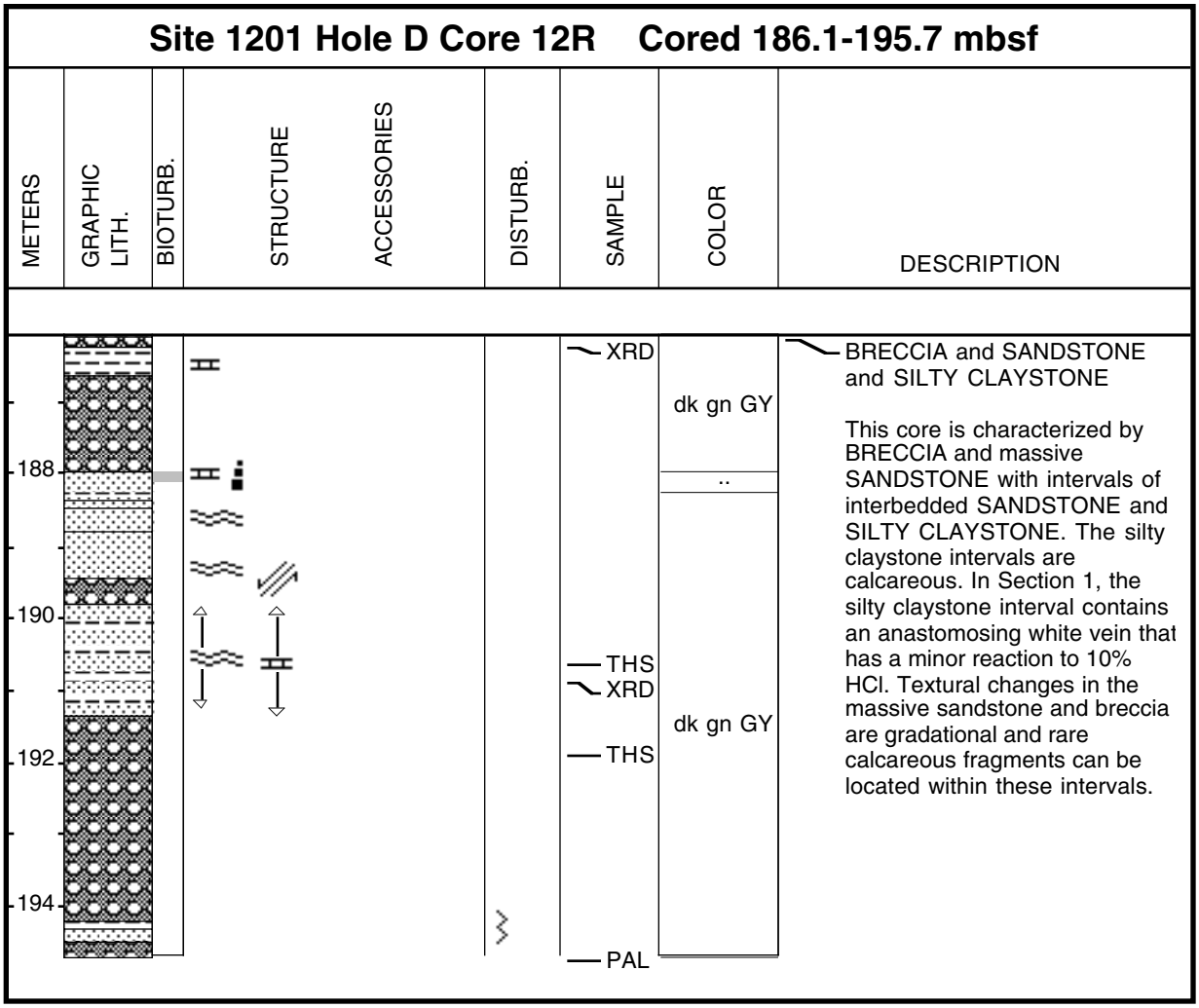
Core Photo


Site 1201 Hole D Core 10R Cored 166.8-176.4 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
168
170
172
XRD
PAL
BK
SANDSTONE and BRECCIA
This core is characterized by medium to coarse SANDSTONE and BRECCIA. Textural changes in the sandstone and breccia are gradational.

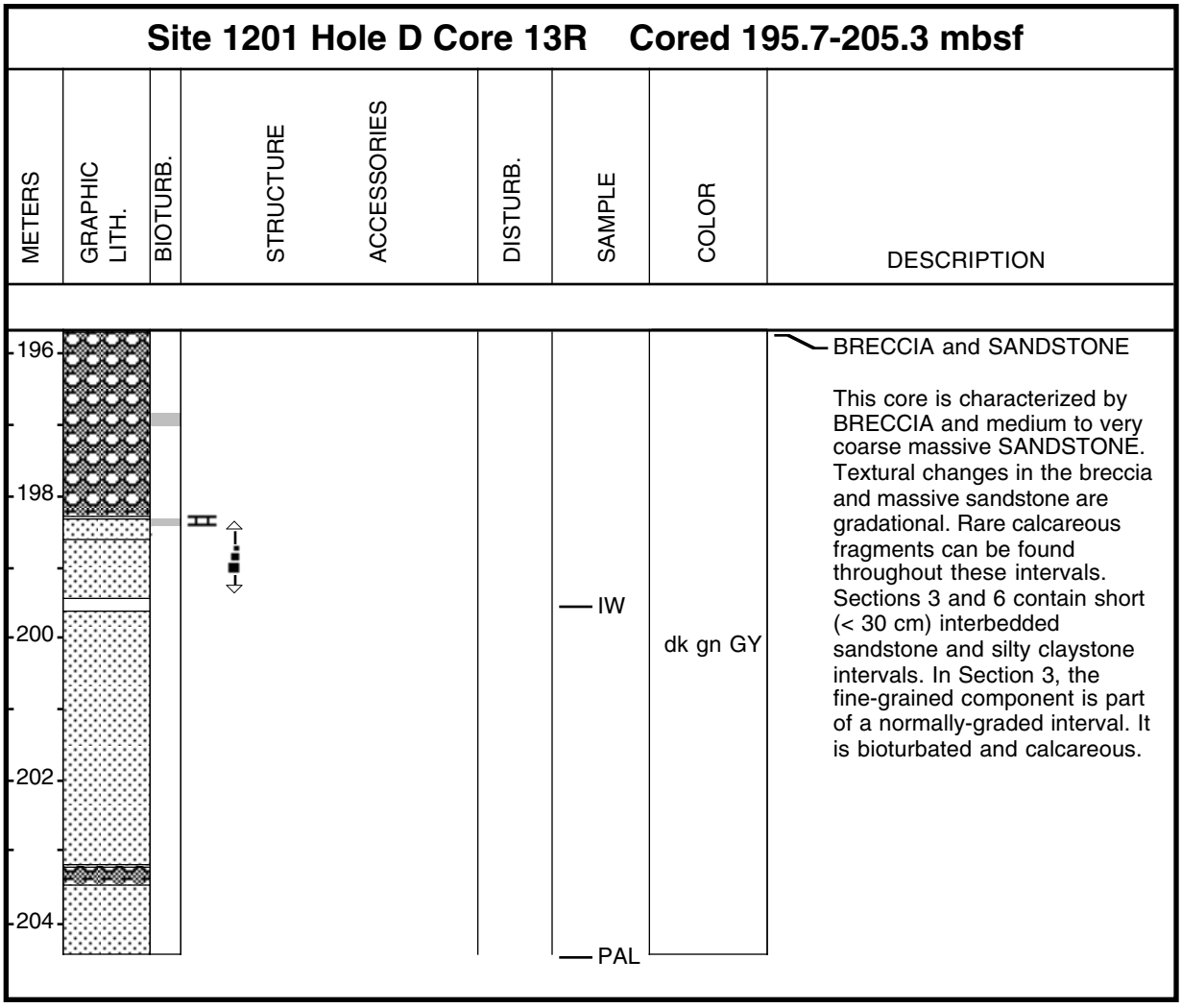
Core Photo


Site 1201 Hole D Core 11R Cored 176.4-186.1 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
178
180
182
184
186
BK
dk gn GY
dk gn GY
IW
PAL
BRECCIA
This core is characterized by massive BRECCIA. Rare calcareous fragments can be found throughout the core. The lowermost interval of Section 7 and the core catcher are highly fractured.

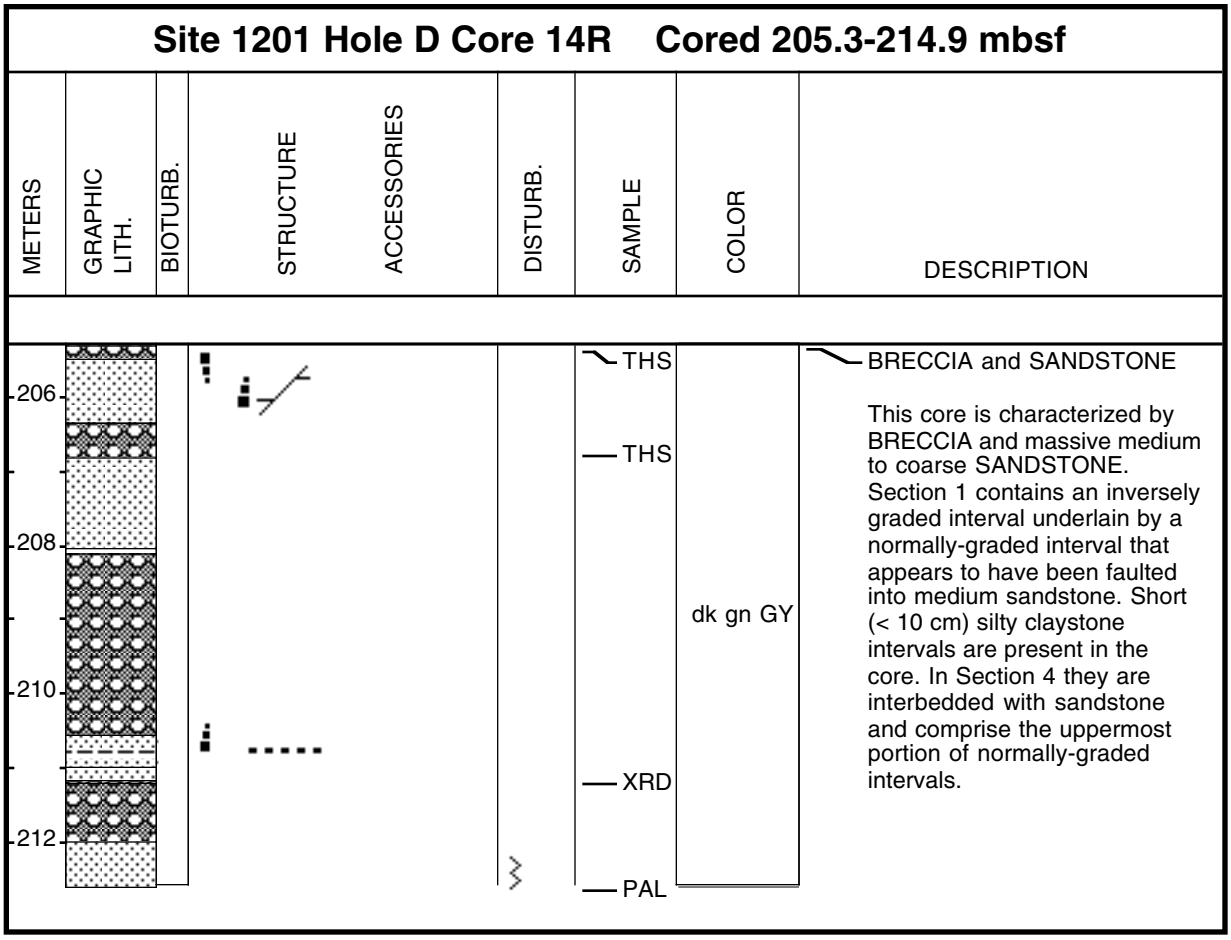
Core Photo


Site 1201 Hole D Core 12R Cored 186.1-195.7 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
188
190
192
194
XRD
THS
XRD
THS
PAL
dk gn GY
dk gn GY
BRECCIA and SANDSTONE and SILTY CLAYSTONE
This core is characterized by BRECCIA and massive SANDSTONE with intervals of interbedded SANDSTONE and SILTY CLAYSTONE. The silty claystone intervals are calcareous. In Section 1, the silty claystone interval contains an anastomosing white vein that has a minor reaction to 10% HCl. Textural changes in the massive sandstone and breccia are gradational and rare calcareous fragments can be located within these intervals.

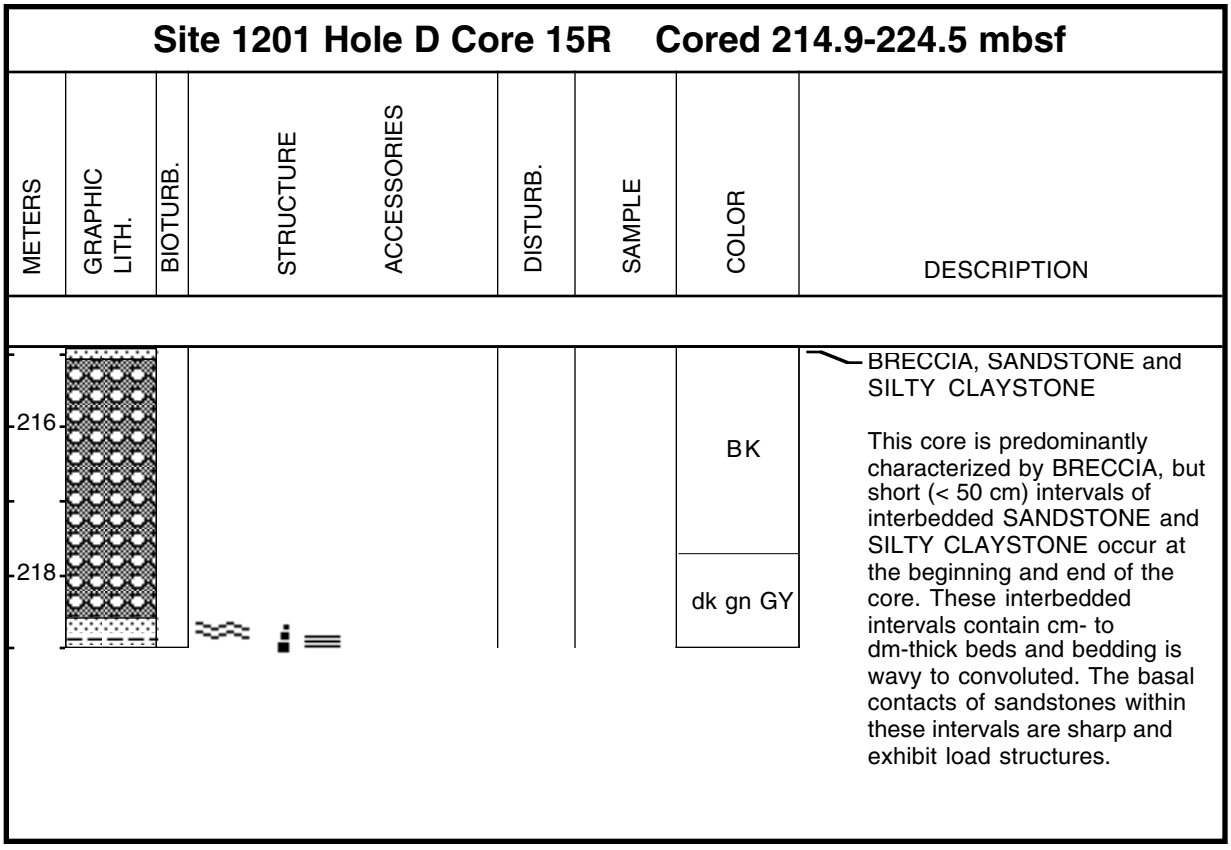
Core Photo


Site 1201 Hole D Core 13R Cored 195.7-205.3 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
196
198
200
202
204
H
IW
PAL
dk gn GY
BRECCIA and SANDSTONE
This core is characterized by BRECCIA and medium to very coarse massive SANDSTONE. Textural changes in the breccia and massive sandstone are gradational. Rare calcareous fragments can be found throughout these intervals. Sections 3 and 6 contain short (< 30 cm) interbedded sandstone and silty claystone intervals. In Section 3, the fine-grained component is part of a normally-graded interval. It is bioturbated and calcareous.

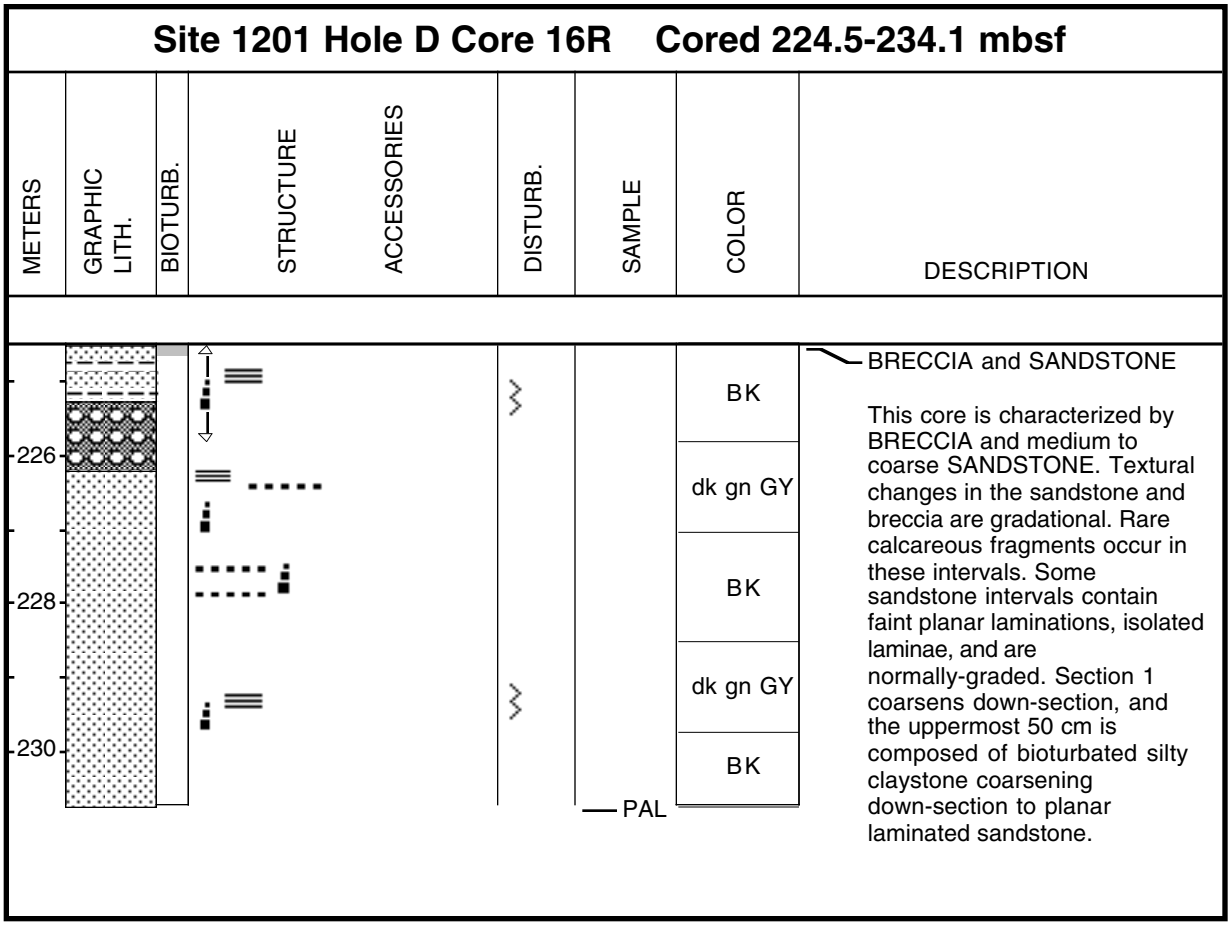
Core Photo


Site 1201 Hole D Core 14R Cored 205.3-214.9 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
206
208
210
212
THS
THS
XRD
PAL
dk gn GY
BRECCIA and SANDSTONE
This core is characterized by BRECCIA and massive medium to coarse SANDSTONE. Section 1 contains an inversely graded interval underlain by a normally-graded interval that appears to have been faulted into medium sandstone. Short (< 10 cm) silty claystone intervals are present in the core. In Section 4 they are interbedded with sandstone and comprise the uppermost portion of normally-graded intervals.

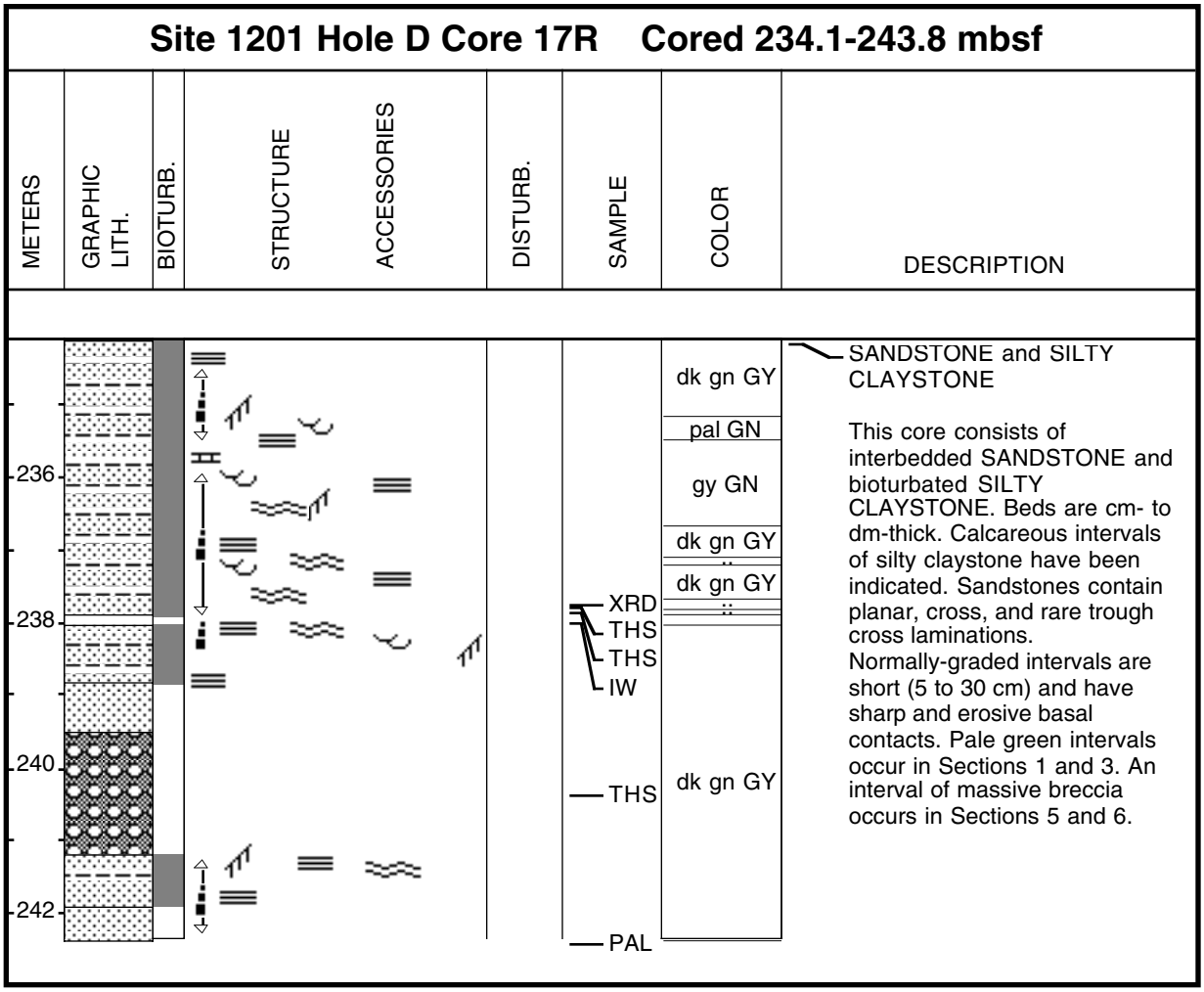
Core Photo


Site 1201 Hole D Core 15R Cored 214.9-224.5 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
216
218
BK
dk gn GY
BRECCIA, SANDSTONE and SILTY CLAYSTONE
This core is predominantly characterized by BRECCIA, but short (< 50 cm) intervals of interbedded SANDSTONE and SILTY CLAYSTONE occur at the beginning and end of the core. These interbedded intervals contain cm- to dm-thick beds and bedding is wavy to convoluted. The basal contacts of sandstones within these intervals are sharp and exhibit load structures.

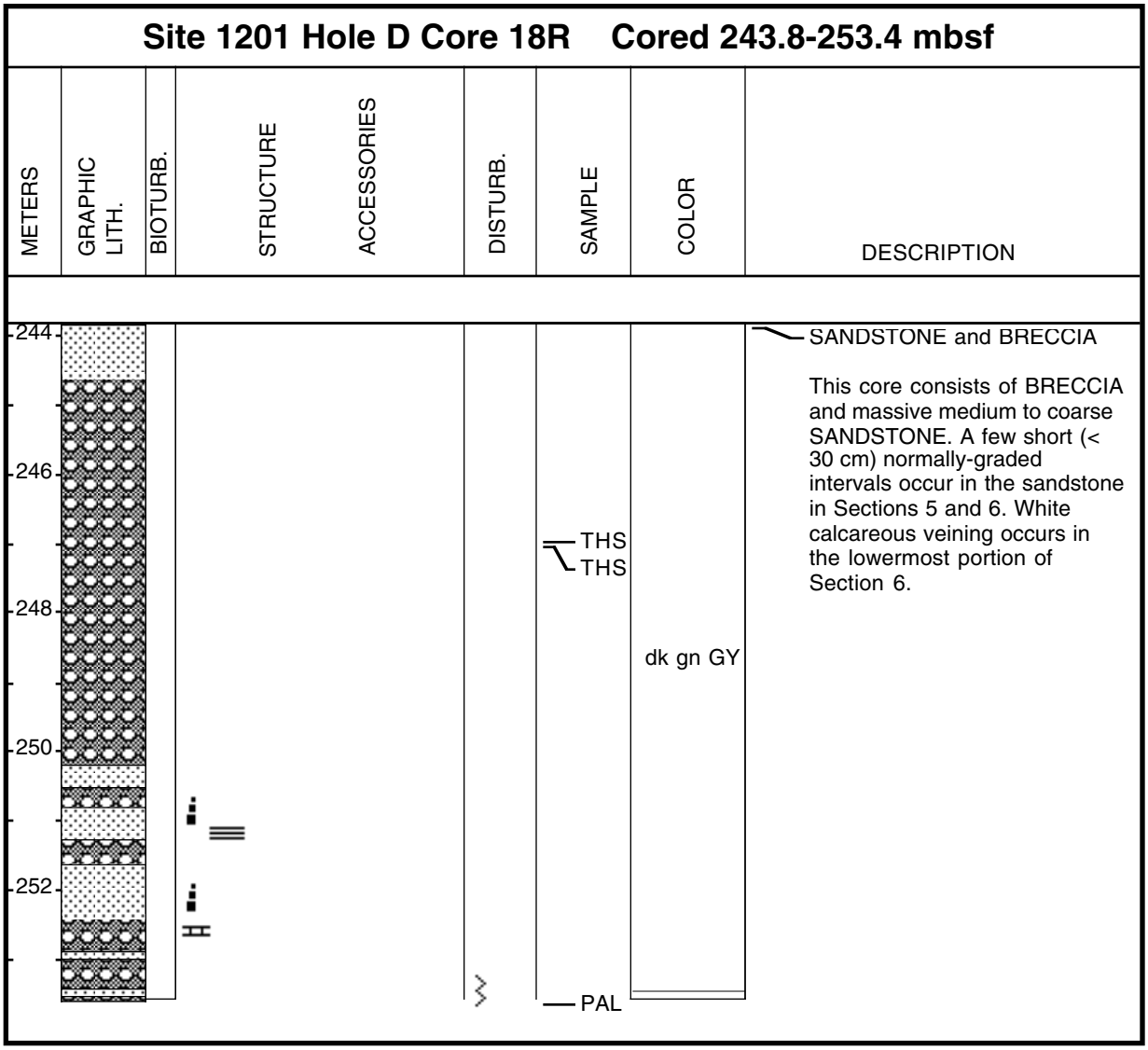
Core Photo


Site 1201 Hole D Core 16R Cored 224.5-234.1 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
226
228
230
PAL
BK
dk gn GY
BK
dk gn GY
BK
BRECCIA and SANDSTONE
This core is characterized by BRECCIA and medium to coarse SANDSTONE. Textural changes in the sandstone and breccia are gradational. Rare calcareous fragments occur in these intervals. Some sandstone intervals contain faint planar laminations, isolated laminae, and are normally-graded. Section 1 coarsens down-section, and the uppermost 50 cm is composed of bioturbated silty claystone coarsening down-section to planar laminated sandstone.

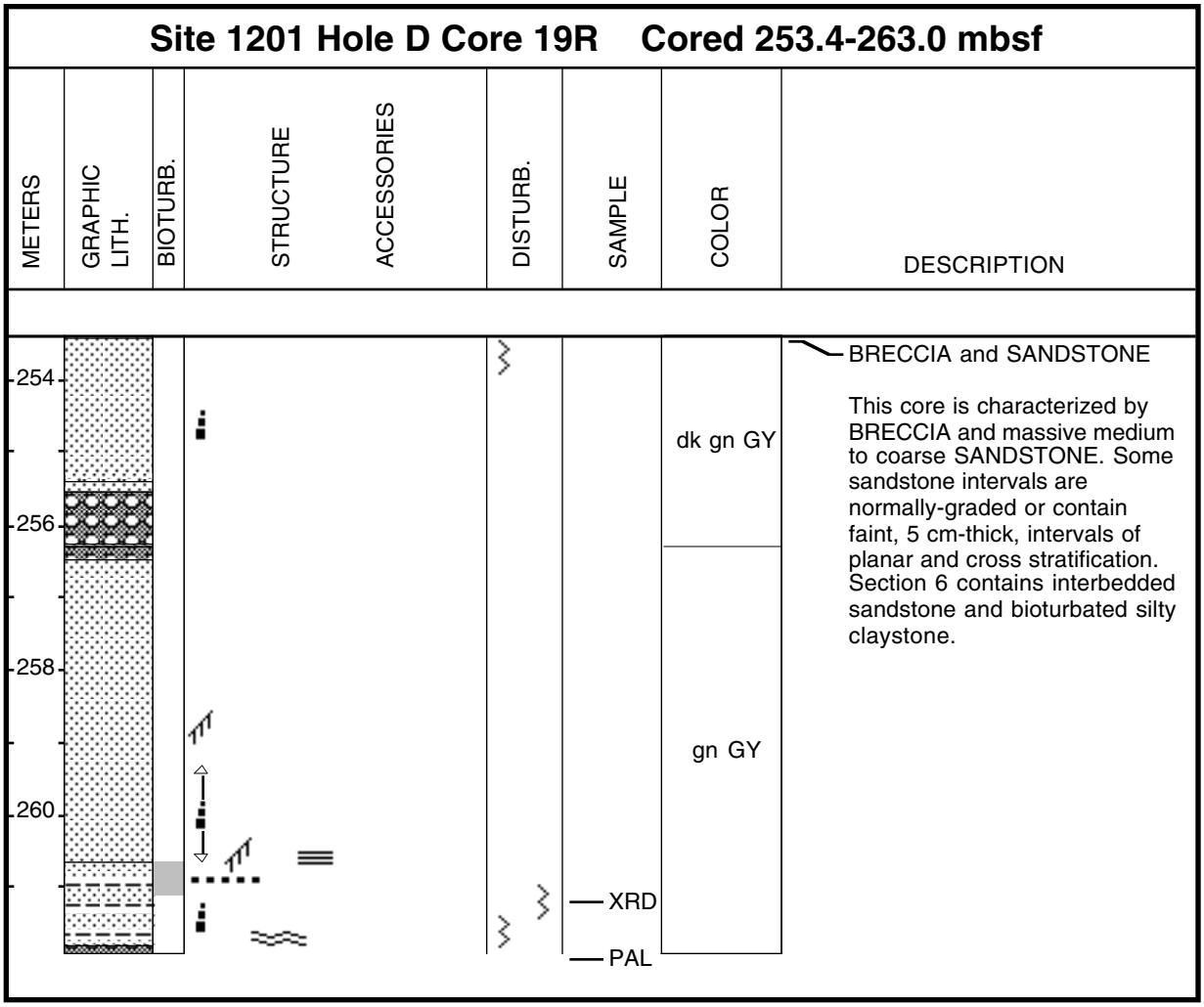
Core Photo


Site 1201 Hole D Core 17R Cored 234.1-243.8 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
236
238
240
242
XRD
THS
THS
IW
THS
PAL
dk gn GY
pal GN
gy GN
dk gn GY
dk gn GY
dk gn GY
SANDSTONE and SILTY CLAYSTONE
This core consists of interbedded SANDSTONE and bioturbated SILTY CLAYSTONE. Beds are cm- to dm-thick. Calcareous intervals of silty claystone have been indicated. Sandstones contain planar, cross, and rare trough cross laminations. Normally-graded intervals are short (5 to 30 cm) and have sharp and erosive basal contacts. Pale green intervals occur in Sections 1 and 3. An interval of massive breccia occurs in Sections 5 and 6.

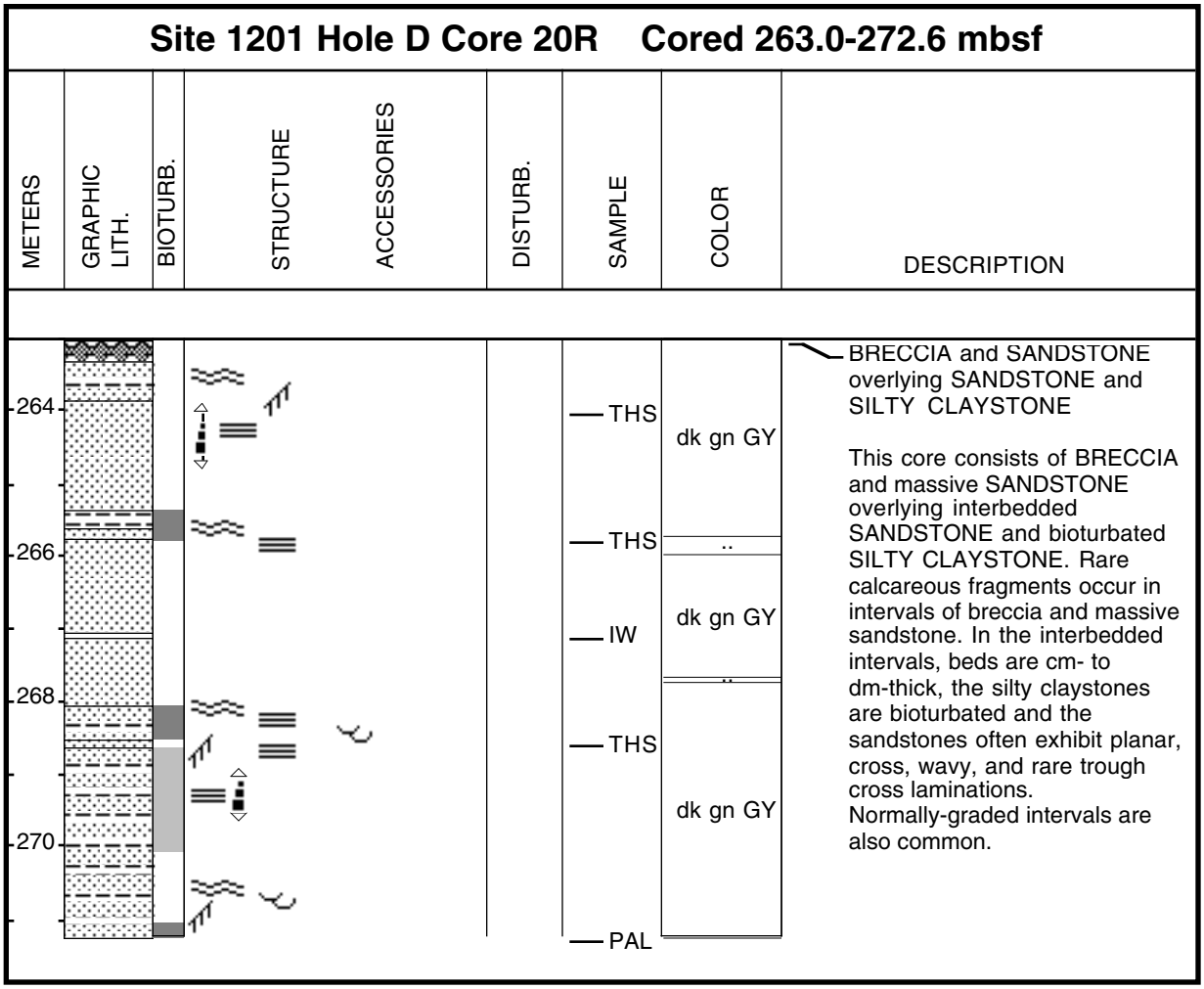
Core Photo


Site 1201 Hole D Core 18R Cored 243.8-253.4 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
244
246
248
250
252
THS
THS
PAL
dk gn GY
SANDSTONE and BRECCIA
This core consists of BRECCIA and massive medium to coarse SANDSTONE. A few short (< 30 cm) normally-graded intervals occur in the sandstone in Sections 5 and 6. White calcareous veining occurs in the lowermost portion of Section 6.

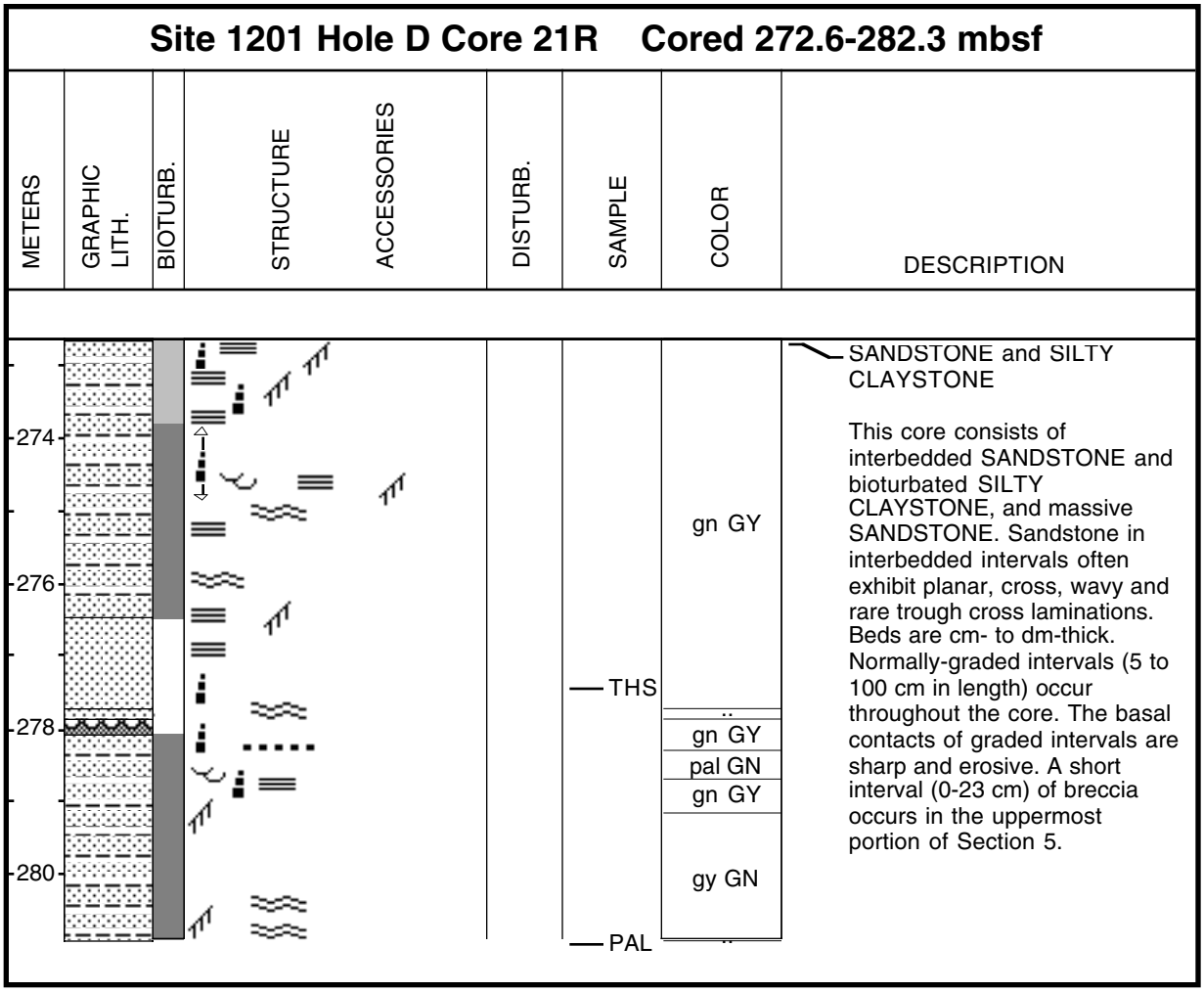
Core Photo


Site 1201 Hole D Core 19R Cored 253.4-263.0 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
254
256
258
260
dk gn GY
gn GY
XRD
PAL
BRECCIA and SANDSTONE
This core is characterized by BRECCIA and massive medium to coarse SANDSTONE. Some sandstone intervals are normally-graded or contain faint, 5 cm-thick, intervals of planar and cross stratification. Section 6 contains interbedded sandstone and bioturbated silty claystone.

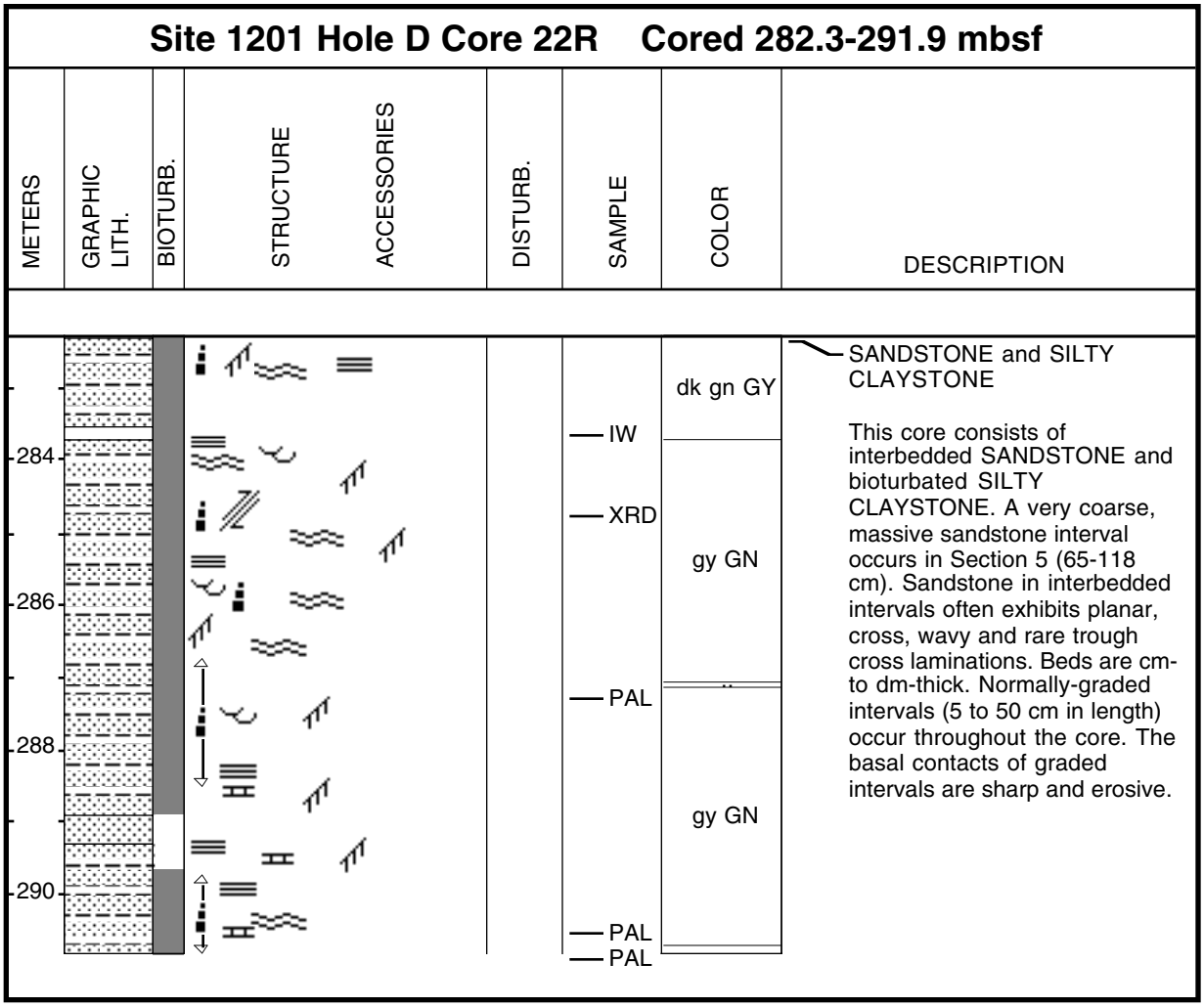
Core Photo


Site 1201 Hole D Core 20R Cored 263.0-272.6 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
264
266
268
270
THS
THS
IW
THS
PAL
dk gn GY
dk gn GY
dk gn GY
BRECCIA and SANDSTONE overlying SANDSTONE and SILTY CLAYSTONE
This core consists of BRECCIA and massive SANDSTONE overlying interbedded SANDSTONE and bioturbated SILTY CLAYSTONE. Rare calcareous fragments occur in intervals of breccia and massive sandstone. In the interbedded intervals, beds are cm- to dm-thick, the silty claystones are bioturbated and the sandstones often exhibit planar, cross, wavy, and rare trough cross laminations. Normally-graded intervals are also common.

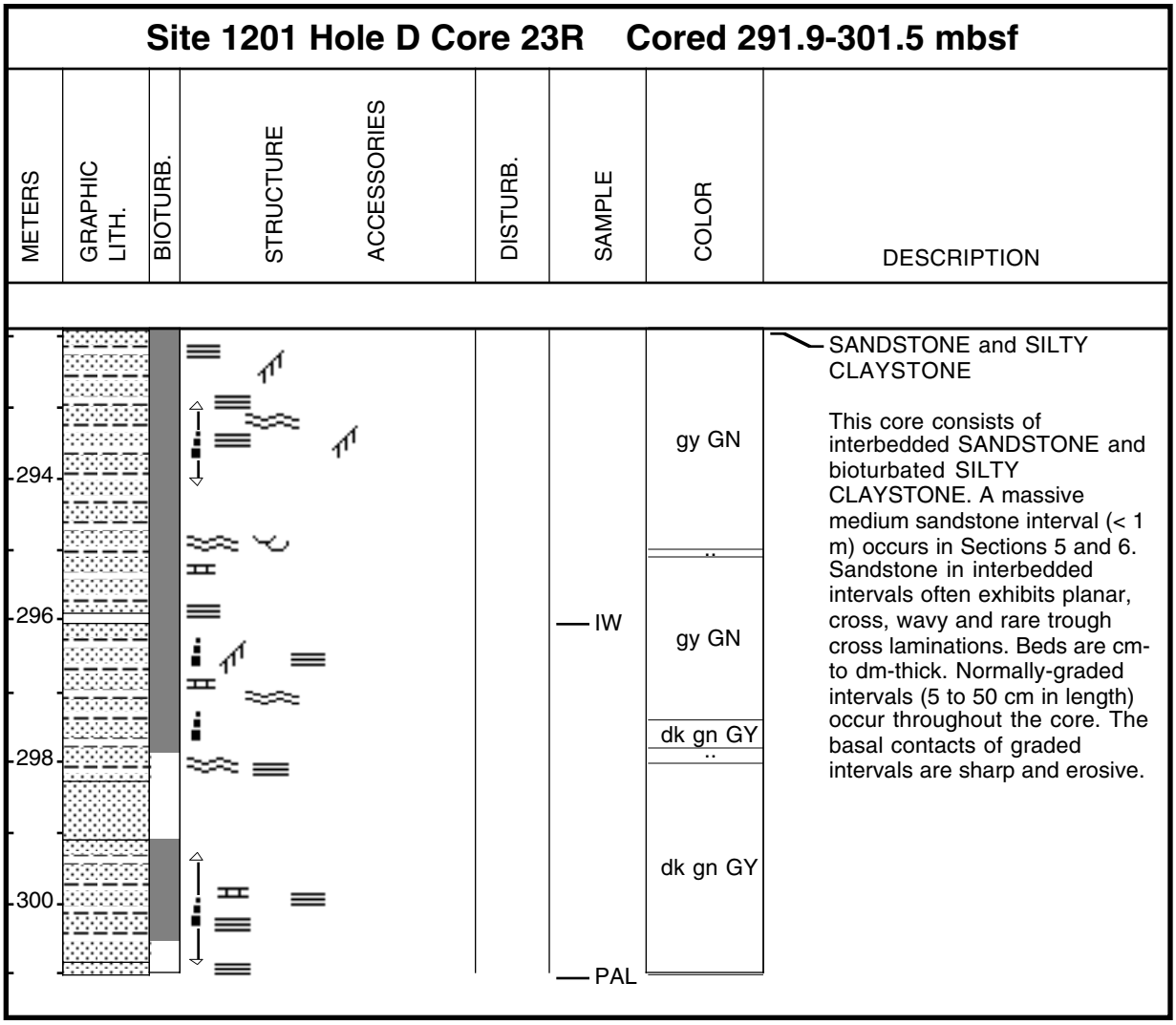
Core Photo


Site 1201 Hole D Core 21R Cored 272.6-282.3 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
274
276
278
280
THS
PAL
gn GY
gn GY
pal GN
gn GY
gy GN
SANDSTONE and SILTY CLAYSTONE
This core consists of interbedded SANDSTONE and bioturbated SILTY CLAYSTONE, and massive SANDSTONE. Sandstone in interbedded intervals often exhibit planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 100 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive. A short interval (0-23 cm) of breccia occurs in the uppermost portion of Section 5.

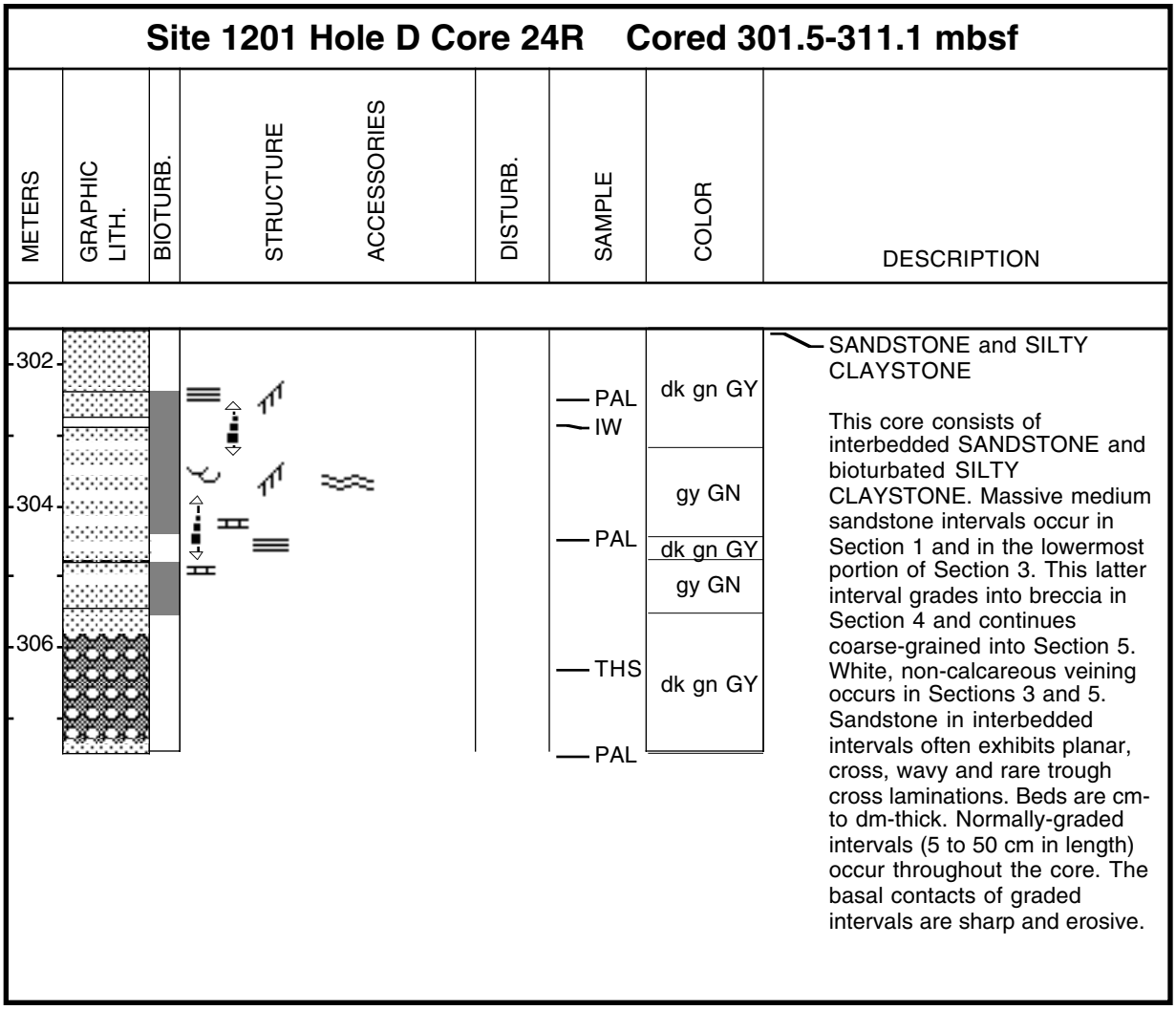
Core Photo


Site 1201 Hole D Core 22R Cored 282.3-291.9 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
284
286
288
290
IW
XRD
PAL
PAL
PAL
dk gn GY
gy GN
gy GN
SANDSTONE and SILTY CLAYSTONE
This core consists of interbedded SANDSTONE and bioturbated SILTY CLAYSTONE. A very coarse, massive sandstone interval occurs in Section 5 (65-118 cm). Sandstone in interbedded intervals often exhibits planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 50 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive.

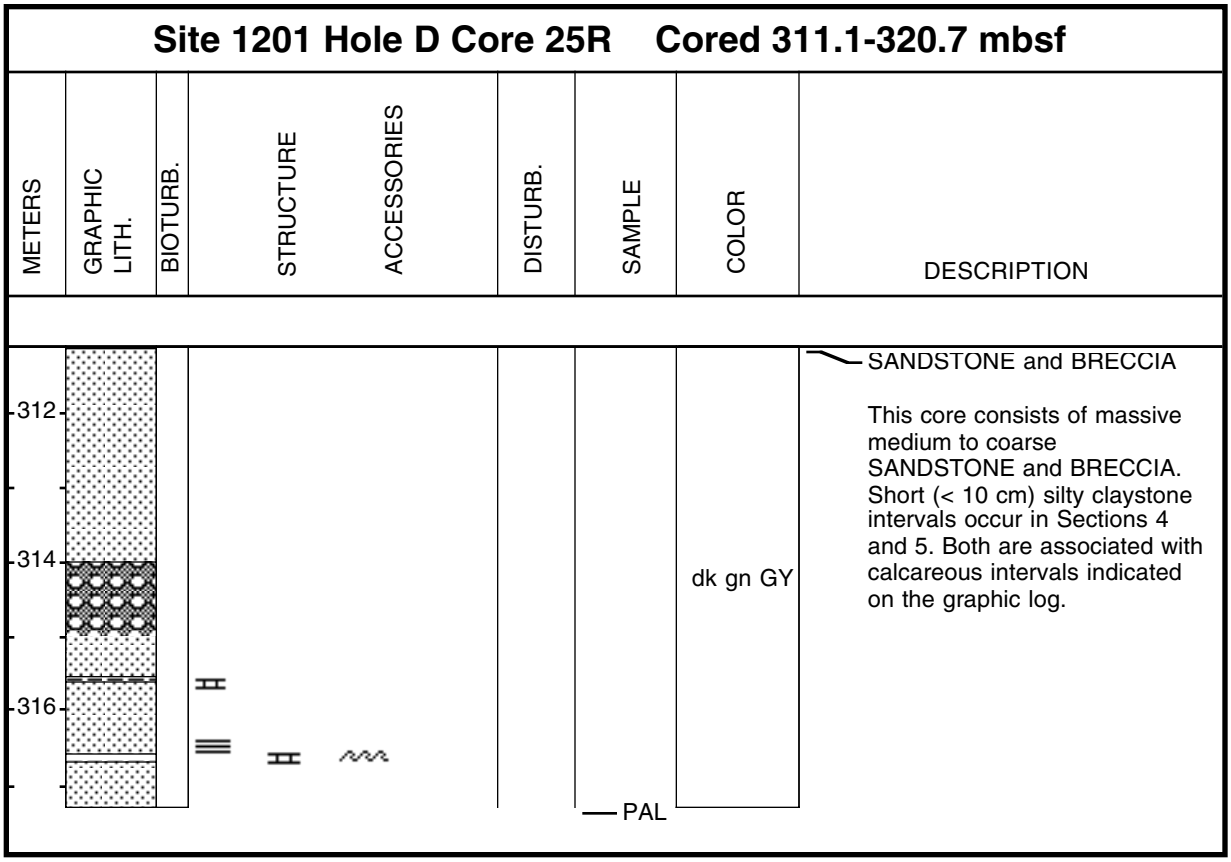
Core Photo


Site 1201 Hole D Core 23R Cored 291.9-301.5 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
294
296
298
300
IW
PAL
gy GN
gy GN
dk gn GY
dk gn GY
SANDSTONE and SILTY CLAYSTONE
This core consists of interbedded SANDSTONE and bioturbated SILTY CLAYSTONE. A massive medium sandstone interval (< 1 m) occurs in Sections 5 and 6. Sandstone in interbedded intervals often exhibits planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 50 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive.

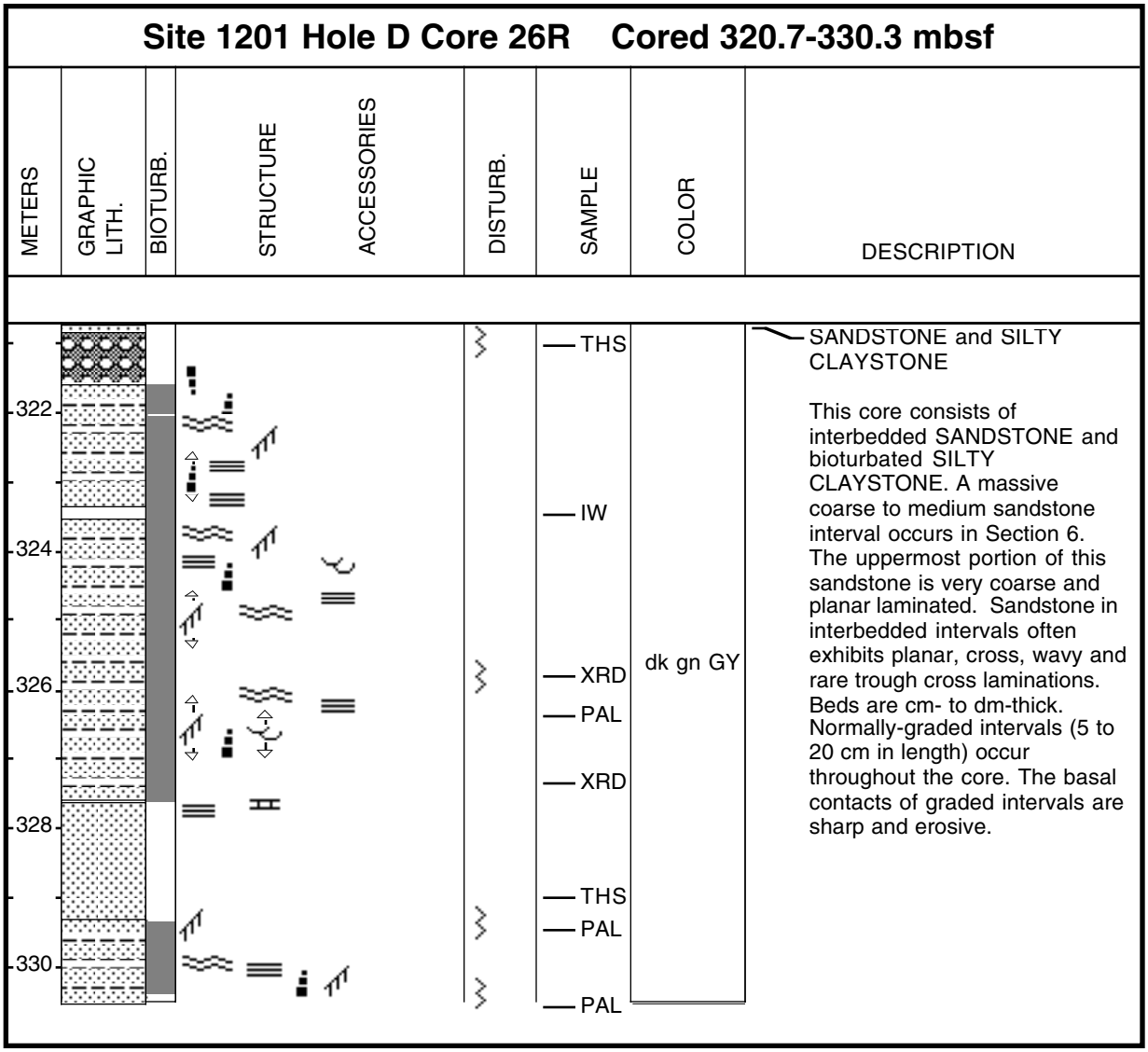
Core Photo


Site 1201 Hole D Core 24R Cored 301.5-311.1 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
302
304
306
PAL
IW
PAL
THS
PAL
dk gn GY
gy GN
dk gn GY
gy GN
dk gn GY
SANDSTONE and SILTY CLAYSTONE
This core consists of interbedded SANDSTONE and bioturbated SILTY CLAYSTONE. Massive medium sandstone intervals occur in Section 1 and in the lowermost portion of Section 3. This latter interval grades into breccia in Section 4 and continues coarse-grained into Section 5. White, non-calcareous veining occurs in Sections 3 and 5. Sandstone in interbedded intervals often exhibits planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 50 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive.

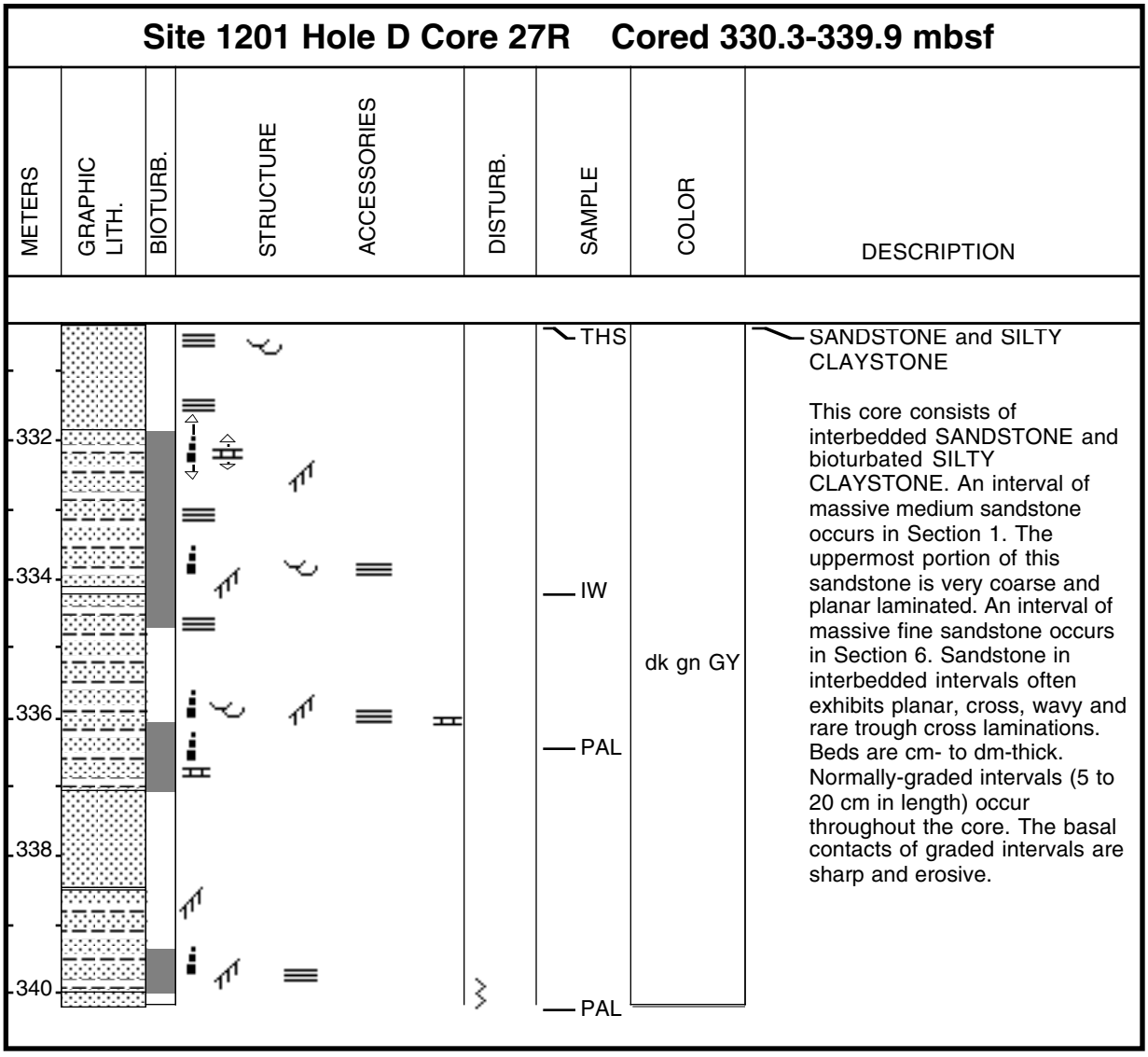
Core Photo


Site 1201 Hole D Core 25R Cored 311.1-320.7 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
312
314
316
PAL
dk gn GY
SANDSTONE and BRECCIA
This core consists of massive medium to coarse SANDSTONE and BRECCIA. Short (< 10 cm) silty claystone intervals occur in Sections 4 and 5. Both are associated with calcareous intervals indicated on the graphic log.

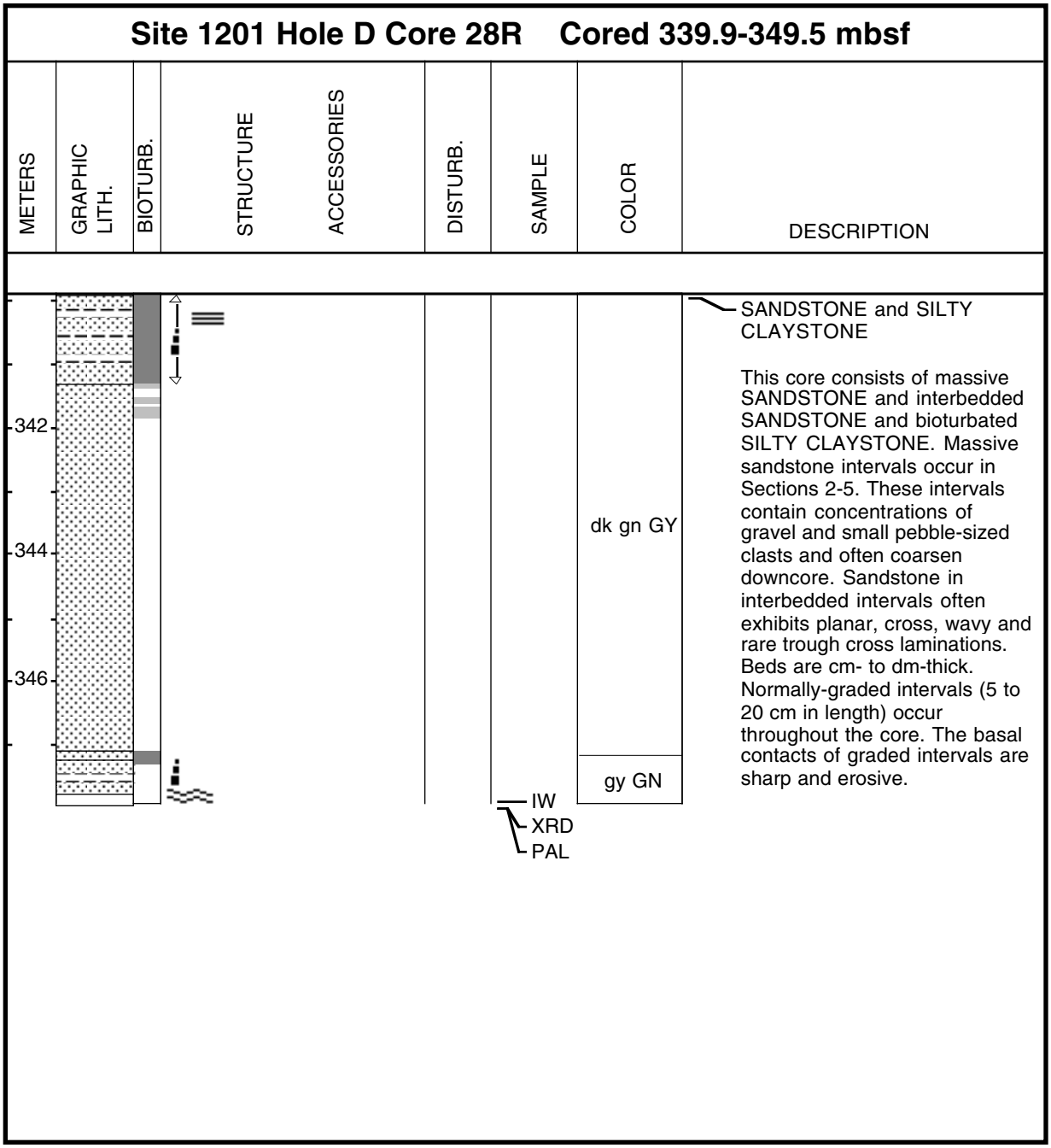
Core Photo


Site 1201 Hole D Core 26R Cored 320.7-330.3 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
322
324
326
328
330
THS
IW
XRD
PAL
XRD
THS
PAL
PAL
dk gn GY
SANDSTONE and SILTY CLAYSTONE
This core consists of interbedded SANDSTONE and bioturbated SILTY CLAYSTONE. A massive coarse to medium sandstone interval occurs in Section 6. The uppermost portion of this sandstone is very coarse and planar laminated. Sandstone in interbedded intervals often exhibits planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 20 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive.

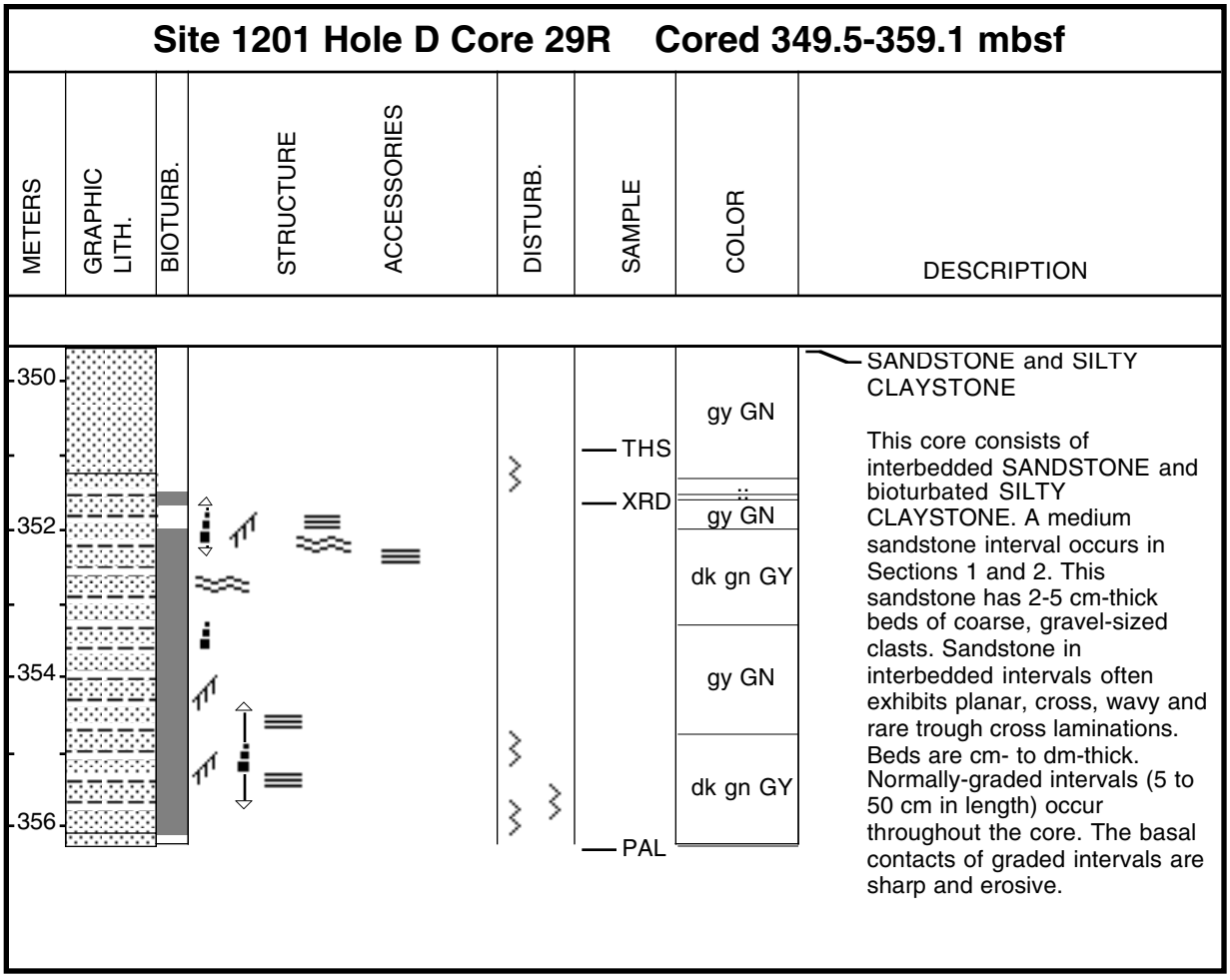
Core Photo


Site 1201 Hole D Core 27R Cored 330.3-339.9 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
332
334
336
338
340
THS
IW
PAL
PAL
dk gn GY
SANDSTONE and SILTY CLAYSTONE
This core consists of interbedded SANDSTONE and bioturbated SILTY CLAYSTONE. An interval of massive medium sandstone occurs in Section 1. The uppermost portion of this sandstone is very coarse and planar laminated. An interval of massive fine sandstone occurs in Section 6. Sandstone in interbedded intervals often exhibits planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 20 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive.

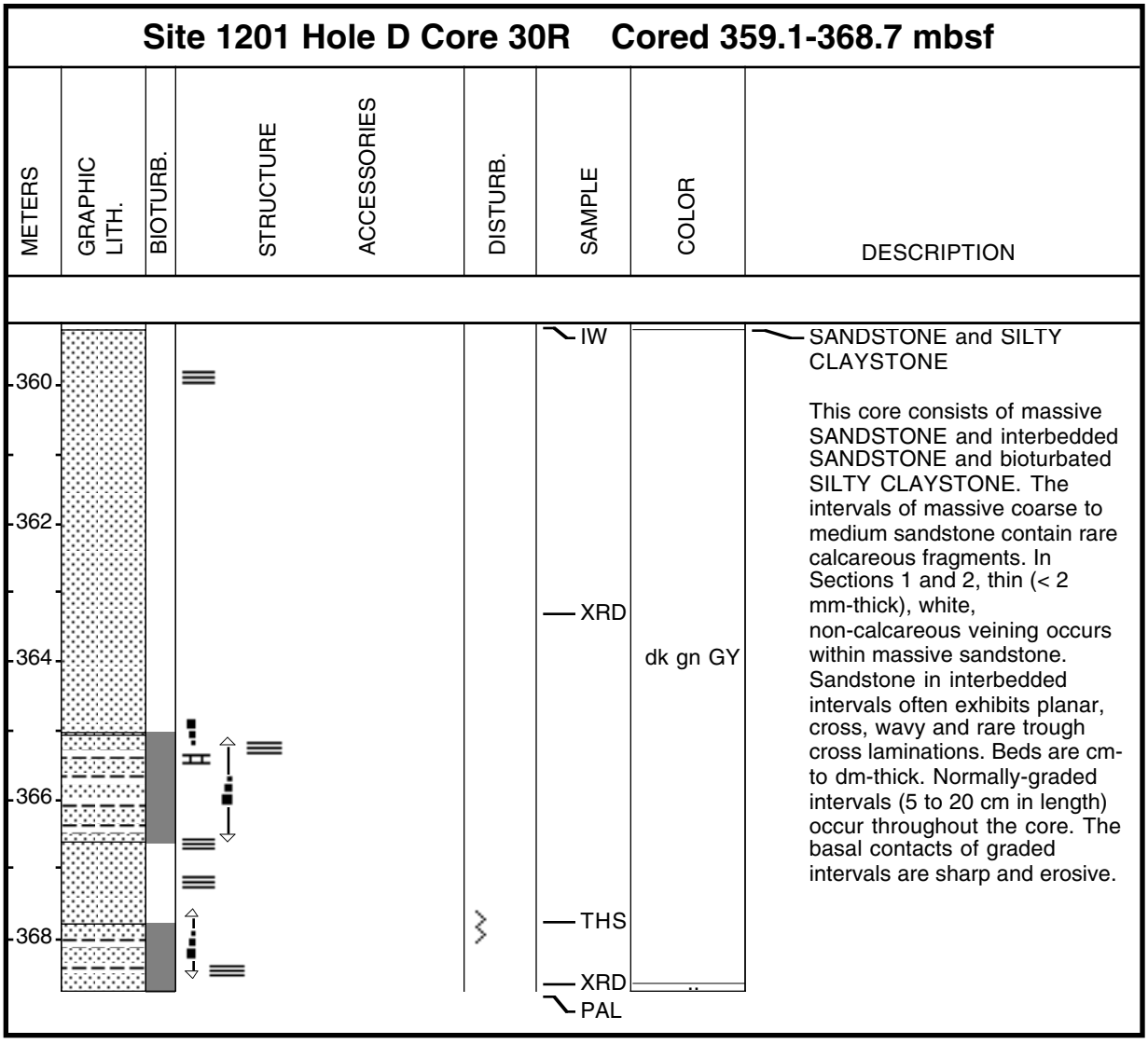
Core Photo


Site 1201 Hole D Core 28R Cored 339.9-349.5 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
342
344
346
dk gn GY
gy GN
IW
XRD
PAL
SANDSTONE and SILTY CLAYSTONE
This core consists of massive SANDSTONE and interbedded SANDSTONE and bioturbated SILTY CLAYSTONE. Massive sandstone intervals occur in Sections 2-5. These intervals contain concentrations of gravel and small pebble-sized clasts and often coarsen downcore. Sandstone in interbedded intervals often exhibits planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 20 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive.

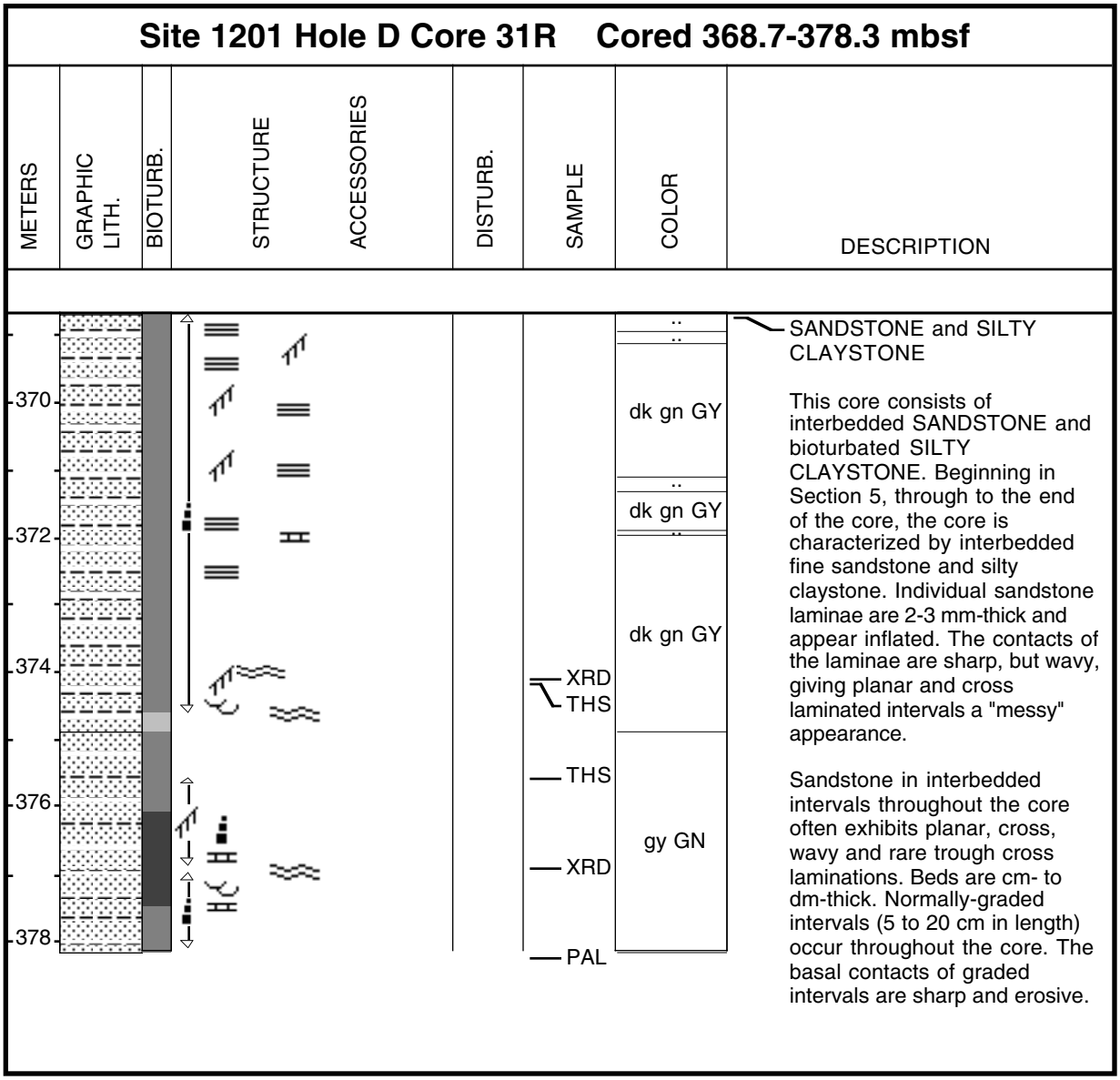
Core Photo


Site 1201 Hole D Core 29R Cored 349.5-359.1 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
350
352
354
356
THS
XRD
PAL
gy GN
gy GN
dk gn GY
gy GN
dk gn GY
SANDSTONE and SILTY CLAYSTONE
This core consists of interbedded SANDSTONE and bioturbated SILTY CLAYSTONE. A medium sandstone interval occurs in Sections 1 and 2. This sandstone has 2-5 cm-thick beds of coarse, gravel-sized clasts. Sandstone in interbedded intervals often exhibits planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 50 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive.

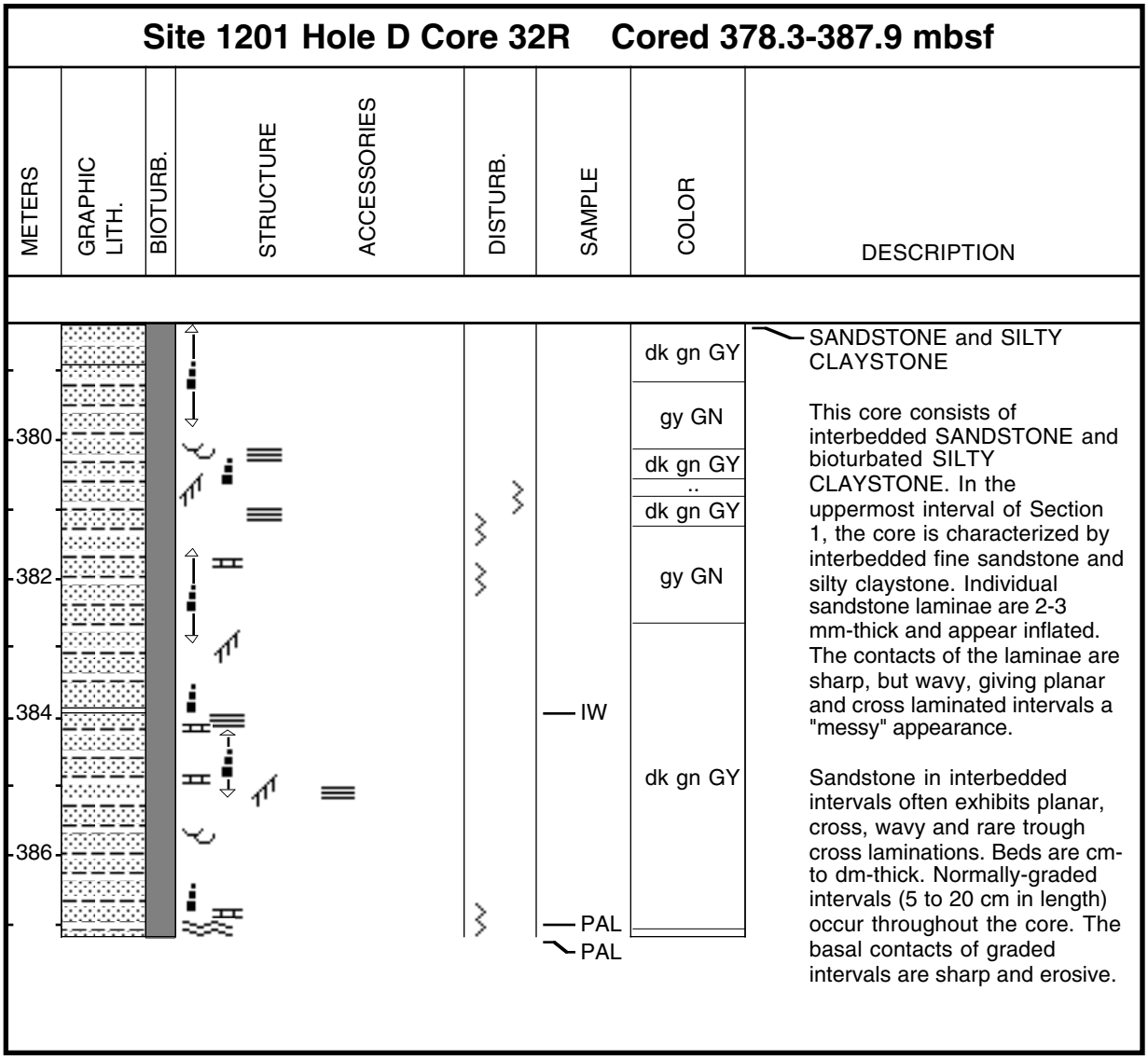
Core Photo


Site 1201 Hole D Core 30R Cored 359.1-368.7 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
360
362
364
366
368
IW
XRD
THS
XRD
PAL
dk gn GY
SANDSTONE and SILTY CLAYSTONE
This core consists of massive SANDSTONE and interbedded SANDSTONE and bioturbated SILTY CLAYSTONE. The intervals of massive coarse to medium sandstone contain rare calcareous fragments. In Sections 1 and 2, thin (< 2 mm-thick), white, non-calcareous veining occurs within massive sandstone. Sandstone in interbedded intervals often exhibits planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 20 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive.

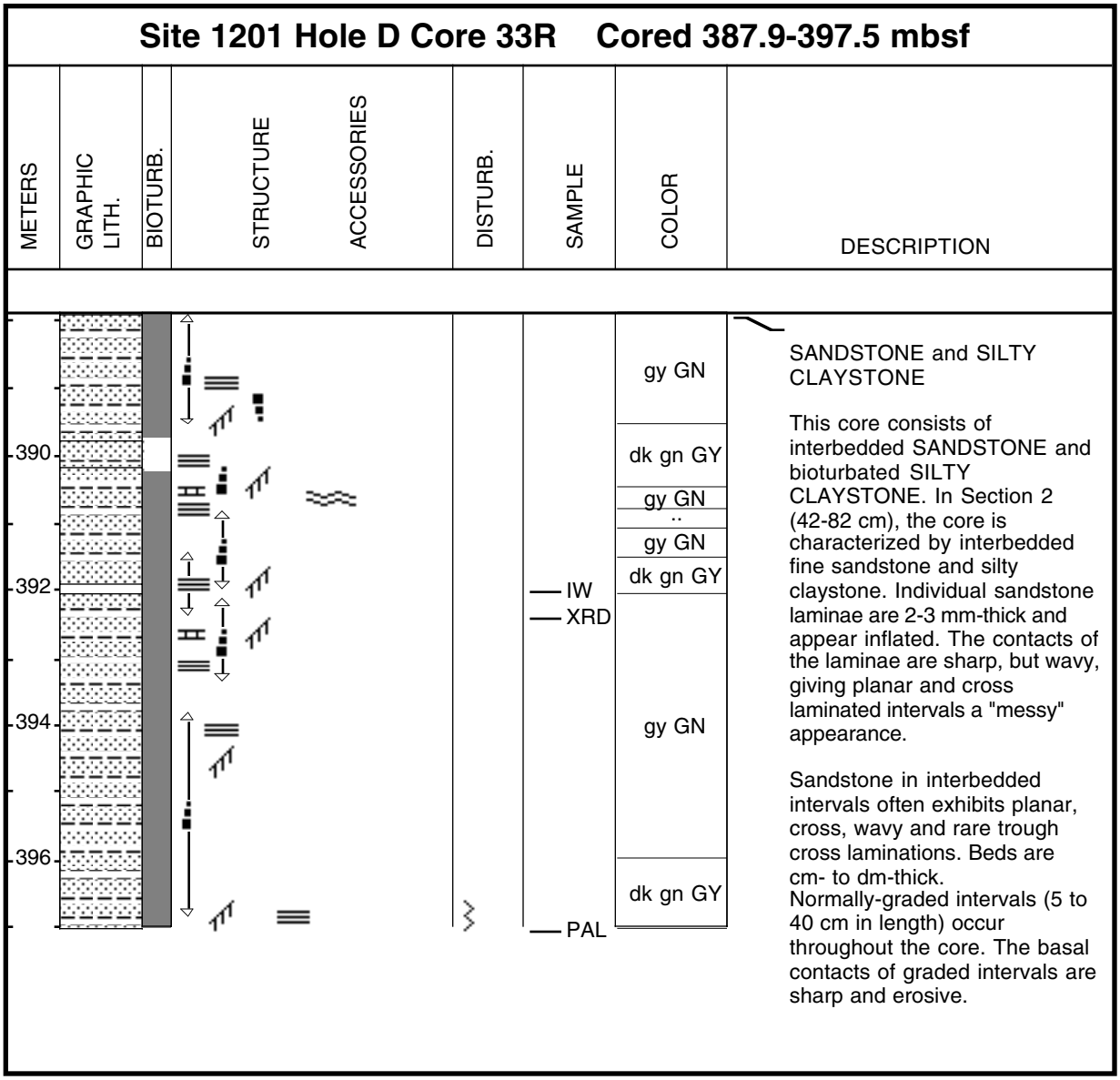
Core Photo


Site 1201 Hole D Core 31R Cored 368.7-378.3 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
370
372
374
376
378
XRD
THS
THS
XRD
PAL
dk gn GY
dk gn GY
dk gn GY
gy GN
SANDSTONE and SILTY CLAYSTONE
This core consists of interbedded SANDSTONE and bioturbated SILTY CLAYSTONE. Beginning in Section 5, through to the end of the core, the core is characterized by interbedded fine sandstone and silty claystone. Individual sandstone laminae are 2-3 mm-thick and appear inflated. The contacts of the laminae are sharp, but wavy, giving planar and cross laminated intervals a "messy" appearance.
Sandstone in interbedded intervals throughout the core often exhibits planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 20 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive.

Core Photo

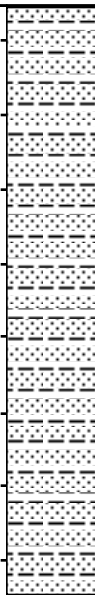
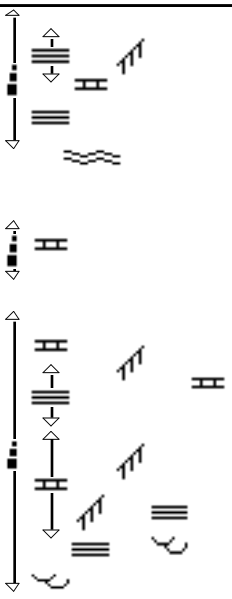

Site 1201 Hole D Core 32R Cored 378.3-387.9 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
380
382
384
386
IW
PAL
PAL
dk gn GY
gy GN
dk gn GY
dk gn GY
gy GN
dk gn GY
SANDSTONE and SILTY CLAYSTONE
This core consists of interbedded SANDSTONE and bioturbated SILTY CLAYSTONE. In the uppermost interval of Section 1, the core is characterized by interbedded fine sandstone and silty claystone. Individual sandstone laminae are 2-3 mm-thick and appear inflated. The contacts of the laminae are sharp, but wavy, giving planar and cross laminated intervals a "messy" appearance.
Sandstone in interbedded intervals often exhibits planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 20 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive.

Core Photo

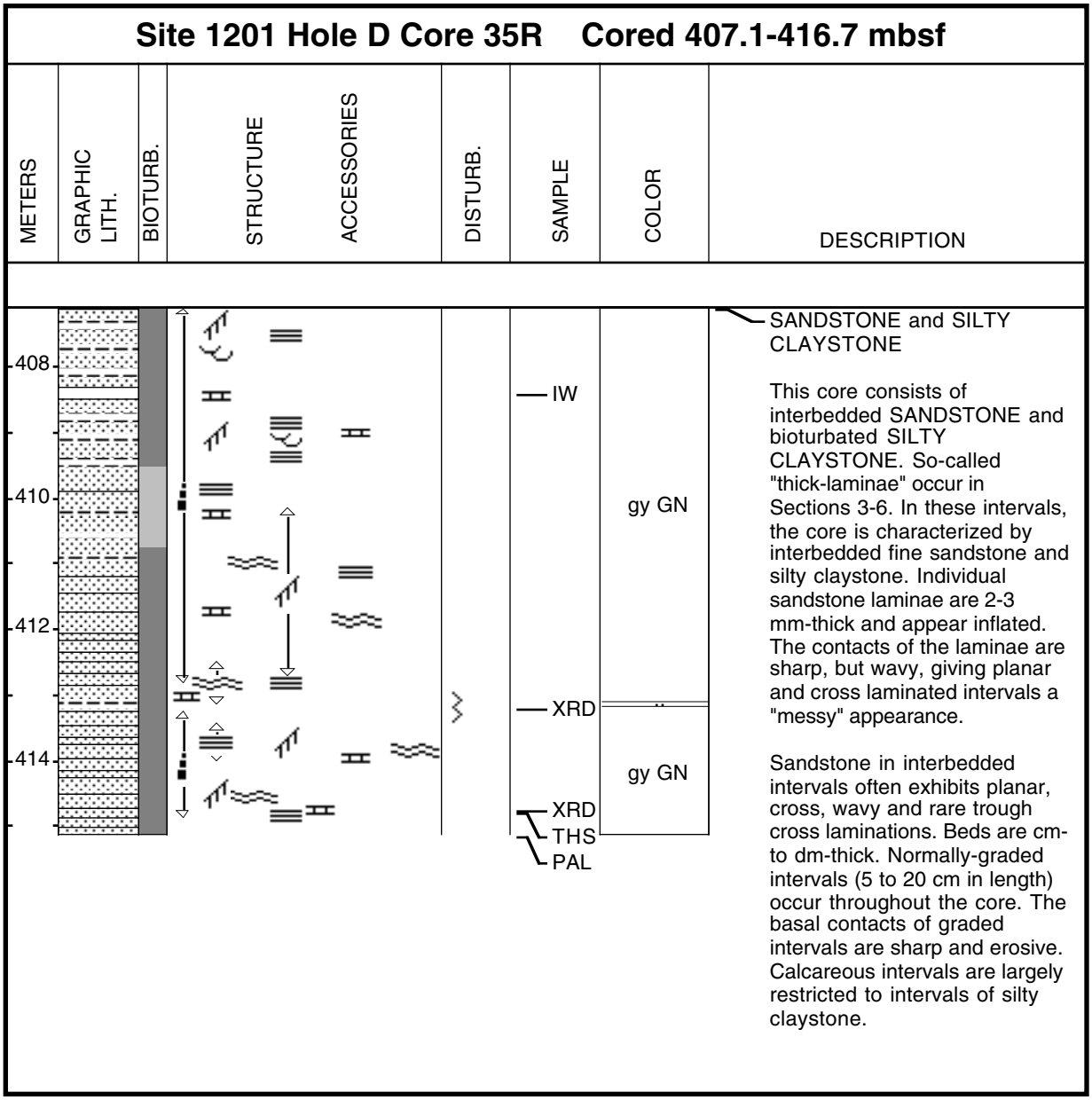

Site 1201 Hole D Core 33R Cored 387.9-397.5 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
390
392
394
396
IW
XRD
PAL
gy GN
dk gn GY
gy GN
gy GN
dk gn GY
gy GN
dk gn GY
SANDSTONE and SILTY CLAYSTONE
This core consists of interbedded SANDSTONE and bioturbated SILTY CLAYSTONE. In Section 2 (42-82 cm), the core is characterized by interbedded fine sandstone and silty claystone. Individual sandstone laminae are 2-3 mm-thick and appear inflated. The contacts of the laminae are sharp, but wavy, giving planar and cross laminated intervals a "messy" appearance.
Sandstone in interbedded intervals often exhibits planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 40 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive.

Core Photo

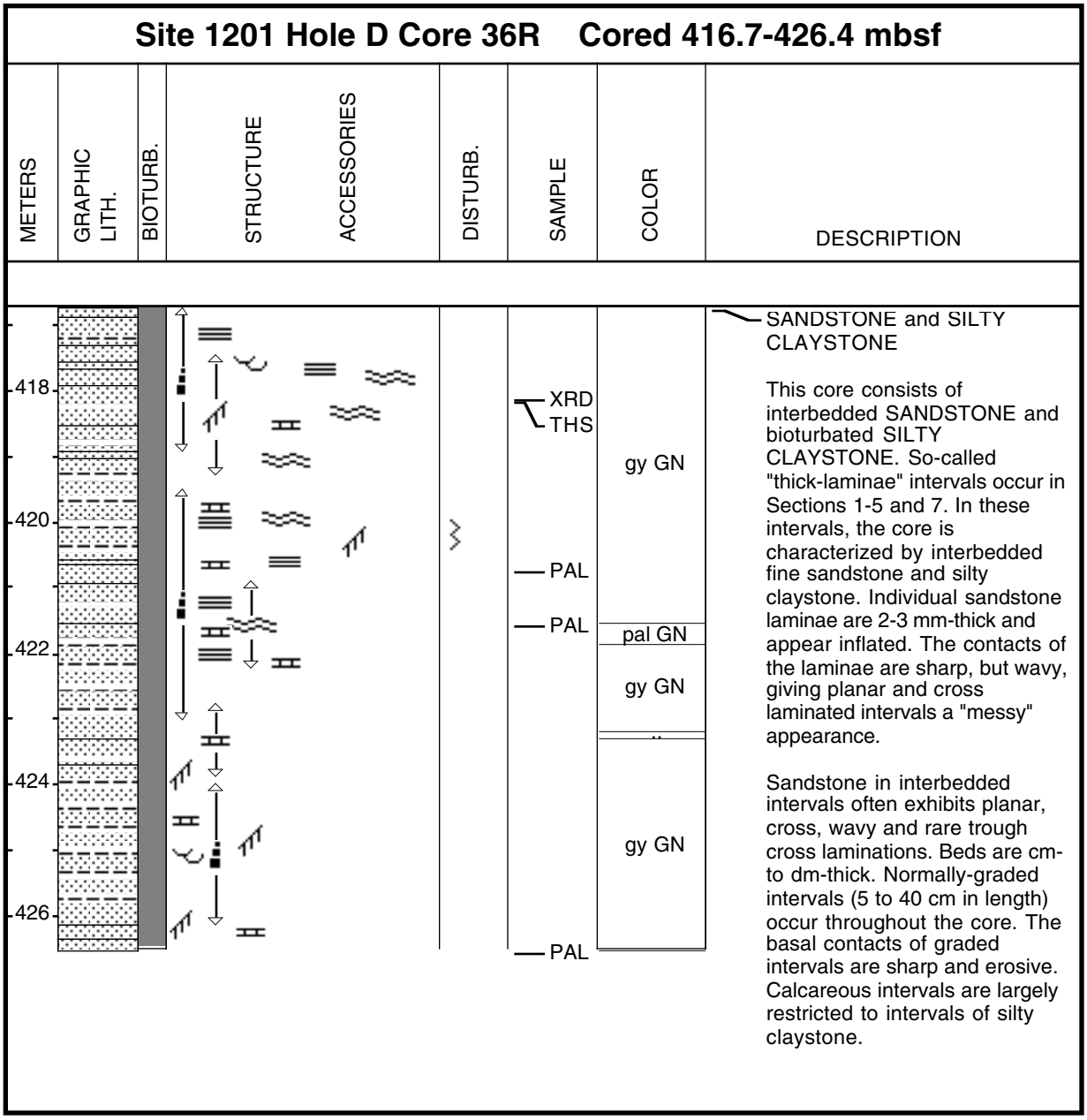
Site 1201 Hole D Core 34R Cored 397.5-407.1 mbsf

METERS	GRAPHIC LITH.	BIOTURB.	STRUCTURE	ACCESSORIES	DISTURB.	SAMPLE	COLOR	DESCRIPTION
398 400 402 404						PAL	dk gn GY	SANDSTONE and SILTY CLAYSTONE This core consists of interbedded SANDSTONE and bioturbated SILTY CLAYSTONE. Sandstone in interbedded intervals often exhibits planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 50 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive. Calcareous intervals indicated are largely restricted to intervals of silty claystone.

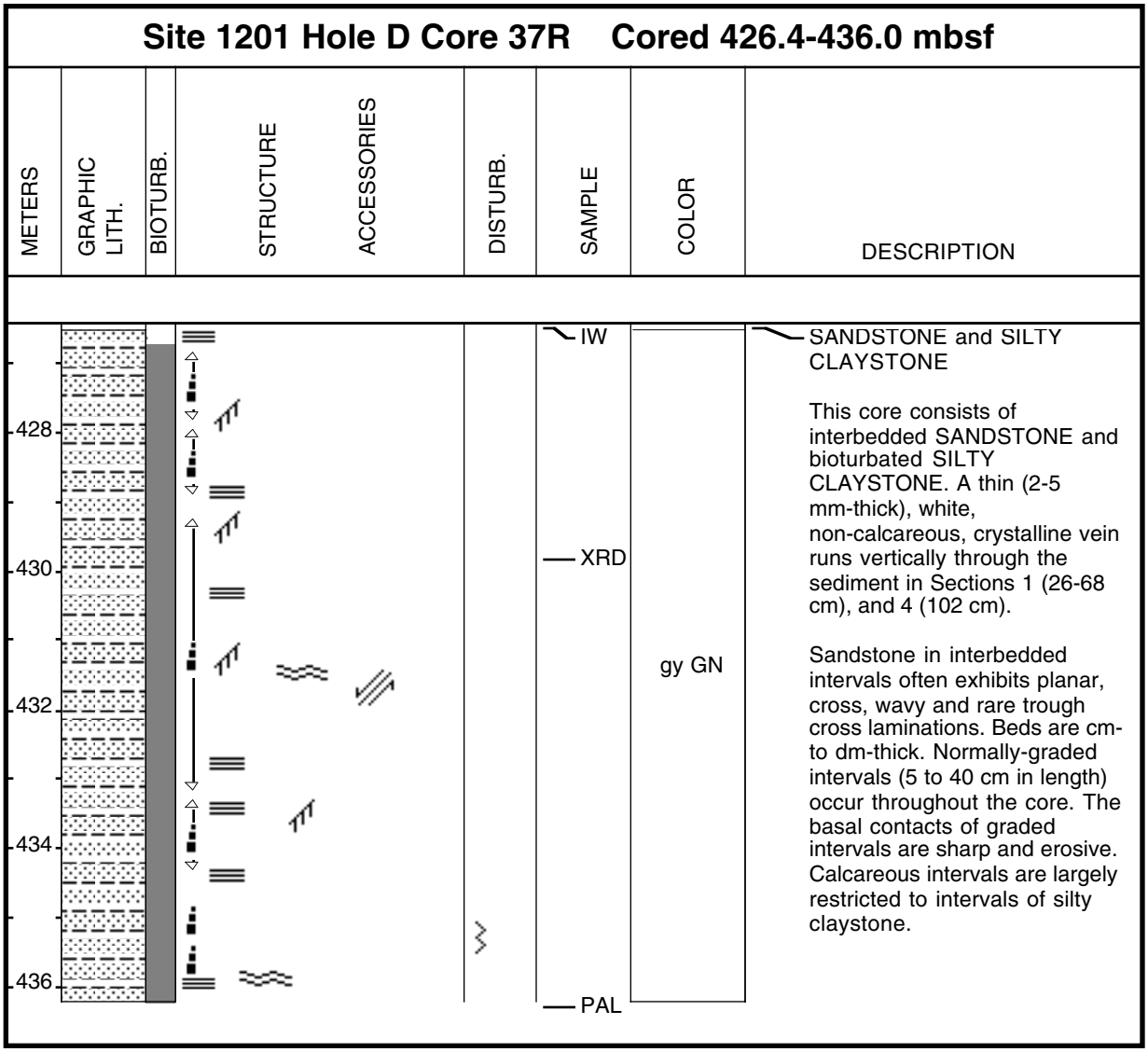
Core Photo


Site 1201 Hole D Core 35R Cored 407.1-416.7 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
408
410
412
414
IW
XRD
XRD
THS
PAL
gy GN
gy GN
SANDSTONE and SILTY CLAYSTONE
This core consists of interbedded SANDSTONE and bioturbated SILTY CLAYSTONE. So-called "thick-laminae" occur in Sections 3-6. In these intervals, the core is characterized by interbedded fine sandstone and silty claystone. Individual sandstone laminae are 2-3 mm-thick and appear inflated. The contacts of the laminae are sharp, but wavy, giving planar and cross laminated intervals a "messy" appearance.
Sandstone in interbedded intervals often exhibits planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 20 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive. Calcareous intervals are largely restricted to intervals of silty claystone.

Core Photo

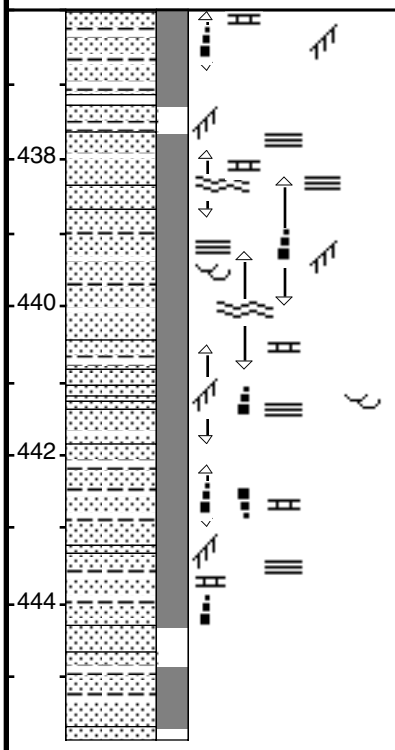

Site 1201 Hole D Core 36R Cored 416.7-426.4 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
418
420
422
424
426
XRD
THS
PAL
PAL
PAL
gy GN
pal GN
gy GN
gy GN
SANDSTONE and SILTY CLAYSTONE
This core consists of interbedded SANDSTONE and bioturbated SILTY CLAYSTONE. So-called "thick-laminae" intervals occur in Sections 1-5 and 7. In these intervals, the core is characterized by interbedded fine sandstone and silty claystone. Individual sandstone laminae are 2-3 mm-thick and appear inflated. The contacts of the laminae are sharp, but wavy, giving planar and cross laminated intervals a "messy" appearance.
Sandstone in interbedded intervals often exhibits planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 40 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive. Calcareous intervals are largely restricted to intervals of silty claystone.

Core Photo


Site 1201 Hole D Core 37R Cored 426.4-436.0 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
428
430
432
434
436
IW
XRD
PAL
gy GN
SANDSTONE and SILTY CLAYSTONE
This core consists of interbedded SANDSTONE and bioturbated SILTY CLAYSTONE. A thin (2-5 mm-thick), white, non-calcareous, crystalline vein runs vertically through the sediment in Sections 1 (26-68 cm), and 4 (102 cm).
Sandstone in interbedded intervals often exhibits planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 40 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive. Calcareous intervals are largely restricted to intervals of silty claystone.

Core Photo

Site 1201 Hole D Core 38R Cored 436.0-445.7 mbsf



DISTURB. | SAMPLE | COLOR

PAL
XRD
THS
IW
PAL
PAL
PAL

gy GN

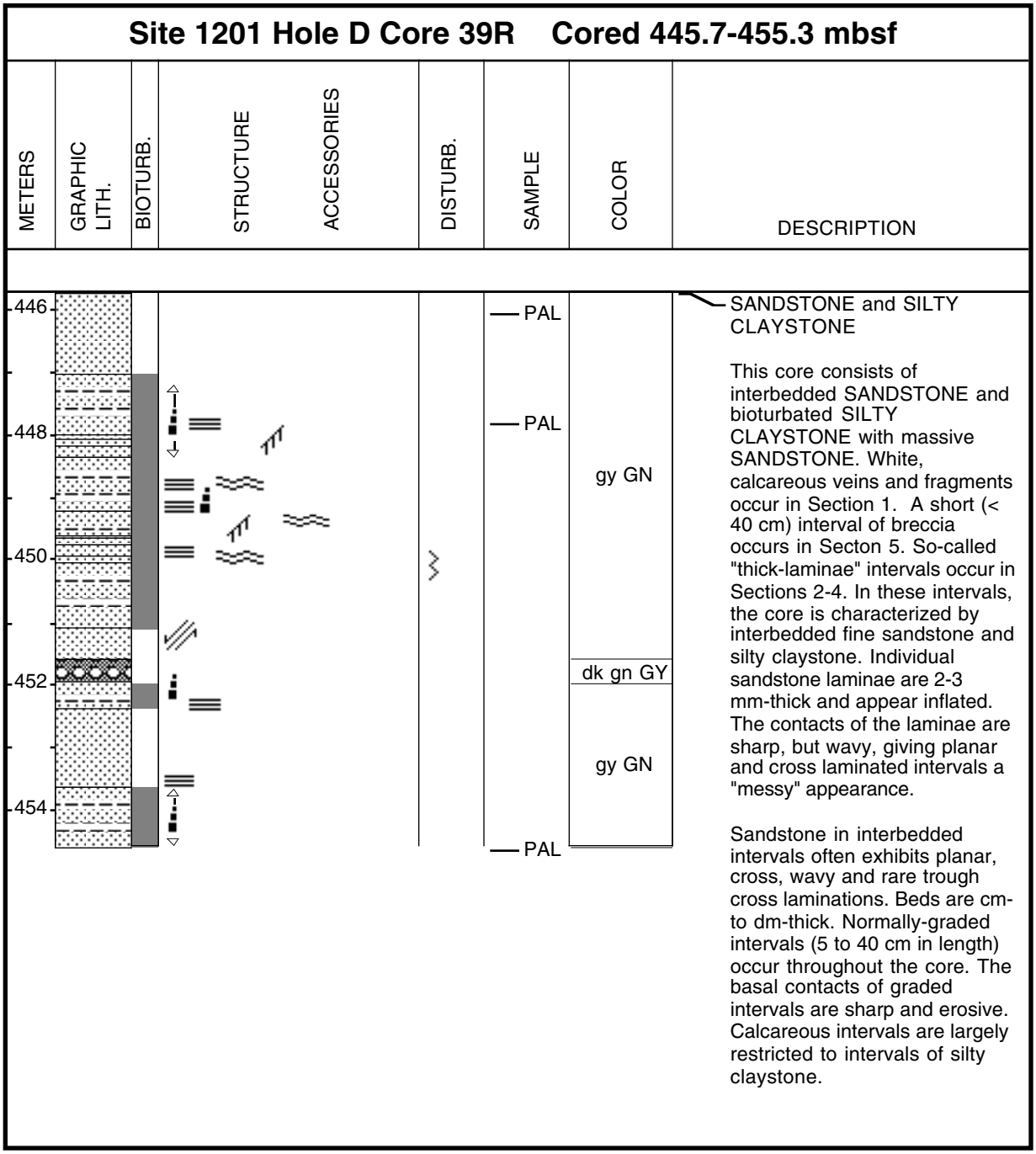
DESCRIPTION

SANDSTONE and SILTY CLAYSTONE

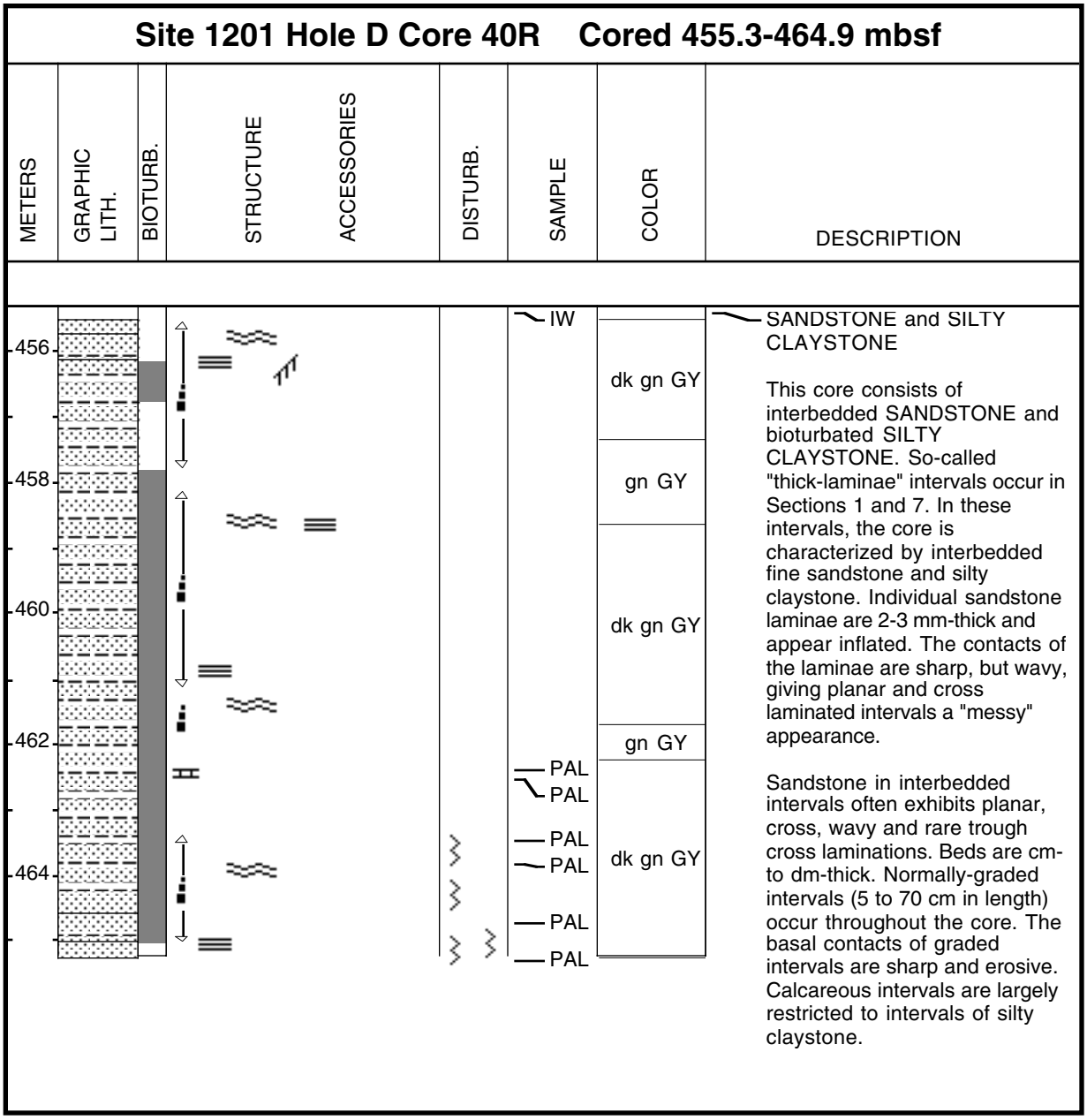
This core consists of interbedded SANDSTONE and bioturbated SILTY CLAYSTONE. White-colored intervals and veining occur in the uppermost portion of Section 1. So-called "thick-laminae" intervals occur in Sections 2-6. In these intervals, the core is characterized by interbedded fine sandstone and silty claystone. Individual sandstone laminae are 2-3 mm-thick and appear inflated. The contacts of the laminae are sharp, but wavy, giving planar and cross laminated intervals a "messy" appearance.

Sandstone in interbedded intervals often exhibits planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 40 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive. Calcareous intervals are largely restricted to intervals of silty claystone.

Core Photo

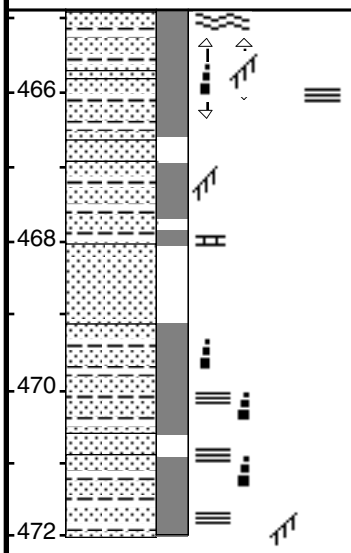

Site 1201 Hole D Core 39R Cored 445.7-455.3 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
446
448
450
452
454
PAL
PAL
PAL
gy GN
dk gn GY
gy GN
SANDSTONE and SILTY CLAYSTONE
This core consists of interbedded SANDSTONE and bioturbated SILTY CLAYSTONE with massive SANDSTONE. White, calcareous veins and fragments occur in Section 1. A short (< 40 cm) interval of breccia occurs in Secton 5. So-called "thick-laminae" intervals occur in Sections 2-4. In these intervals, the core is characterized by interbedded fine sandstone and silty claystone. Individual sandstone laminae are 2-3 mm-thick and appear inflated. The contacts of the laminae are sharp, but wavy, giving planar and cross laminated intervals a "messy" appearance.
Sandstone in interbedded intervals often exhibits planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 40 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive. Calcareous intervals are largely restricted to intervals of silty claystone.

Core Photo


Site 1201 Hole D Core 40R Cored 455.3-464.9 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
456
458
460
462
464
IW
PAL
PAL
PAL
PAL
PAL
PAL
dk gn GY
gn GY
dk gn GY
gn GY
dk gn GY
SANDSTONE and SILTY CLAYSTONE
This core consists of interbedded SANDSTONE and bioturbated SILTY CLAYSTONE. So-called "thick-laminae" intervals occur in Sections 1 and 7. In these intervals, the core is characterized by interbedded fine sandstone and silty claystone. Individual sandstone laminae are 2-3 mm-thick and appear inflated. The contacts of the laminae are sharp, but wavy, giving planar and cross laminated intervals a "messy" appearance.
Sandstone in interbedded intervals often exhibits planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 70 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive. Calcareous intervals are largely restricted to intervals of silty claystone.

Core Photo

Site 1201 Hole D Core 41R Cored 464.9-474.5 mbsf

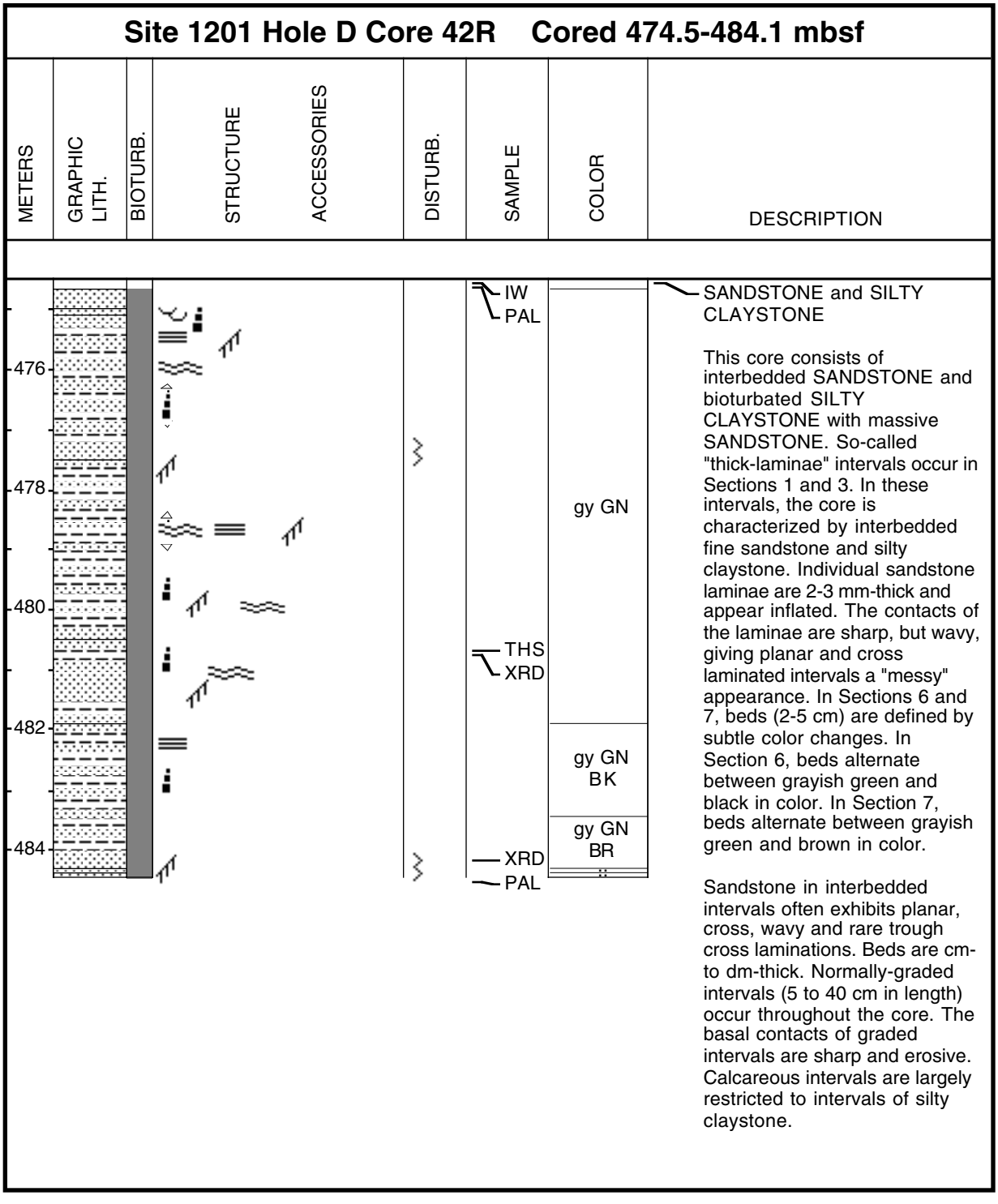


SANDSTONE and SILTY CLAYSTONE

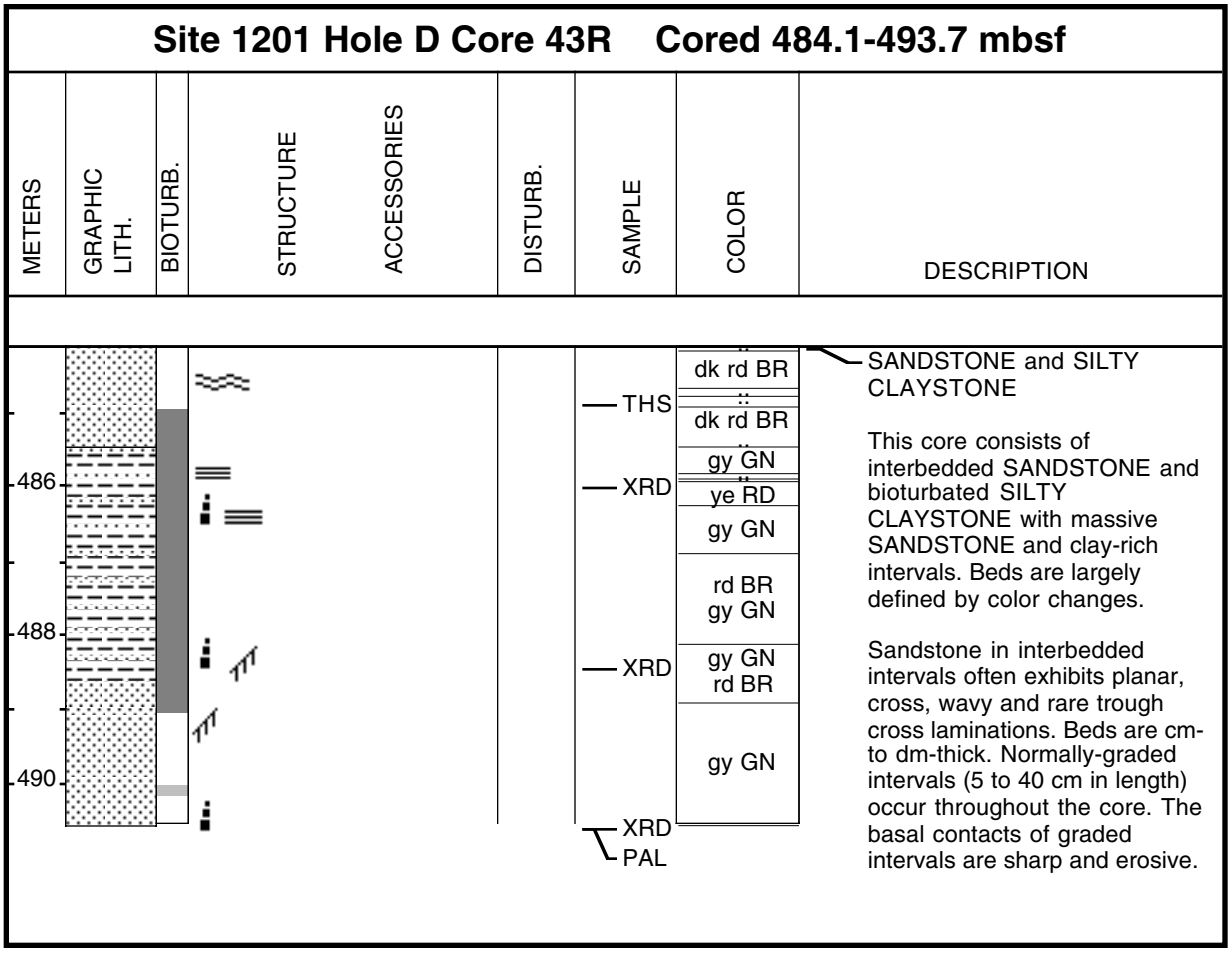
This core consists of interbedded SANDSTONE and bioturbated SILTY CLAYSTONE with massive SANDSTONE. Massive sandstone occurs in Sections 3 and 5. So-called "thick-laminae" occur in Section 1 (80-92 cm). In this interval, the core is characterized by interbedded fine sandstone and silty claystone. Individual sandstone laminae are 2-3 mm-thick and appear inflated. The contacts of the laminae are sharp, but wavy, giving planar and cross laminated intervals a "messy" appearance.

Sandstone in interbedded intervals often exhibits planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 40 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive. Calcareous intervals are largely restricted to intervals of silty claystone.

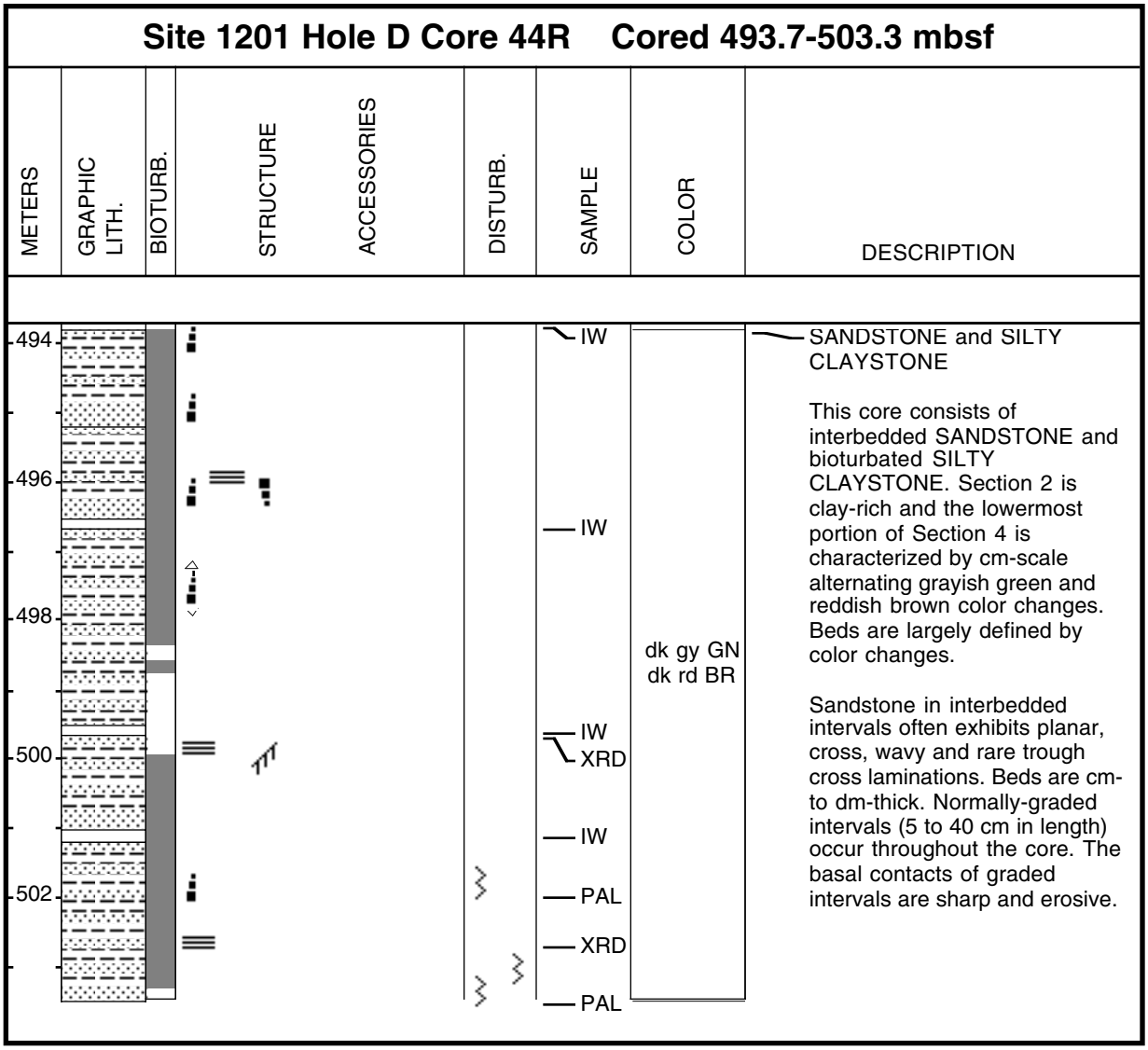
Core Photo


Site 1201 Hole D Core 42R Cored 474.5-484.1 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
476
478
480
482
484
IW
PAL
THS
XRD
XRD
PAL
gy GN
gy GN BK
gy GN BR
SANDSTONE and SILTY CLAYSTONE
This core consists of interbedded SANDSTONE and bioturbated SILTY CLAYSTONE with massive SANDSTONE. So-called "thick-laminae" intervals occur in Sections 1 and 3. In these intervals, the core is characterized by interbedded fine sandstone and silty claystone. Individual sandstone laminae are 2-3 mm-thick and appear inflated. The contacts of the laminae are sharp, but wavy, giving planar and cross laminated intervals a "messy" appearance. In Sections 6 and 7, beds (2-5 cm) are defined by subtle color changes. In Section 6, beds alternate between grayish green and black in color. In Section 7, beds alternate between grayish green and brown in color.
Sandstone in interbedded intervals often exhibits planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 40 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive. Calcareous intervals are largely restricted to intervals of silty claystone.

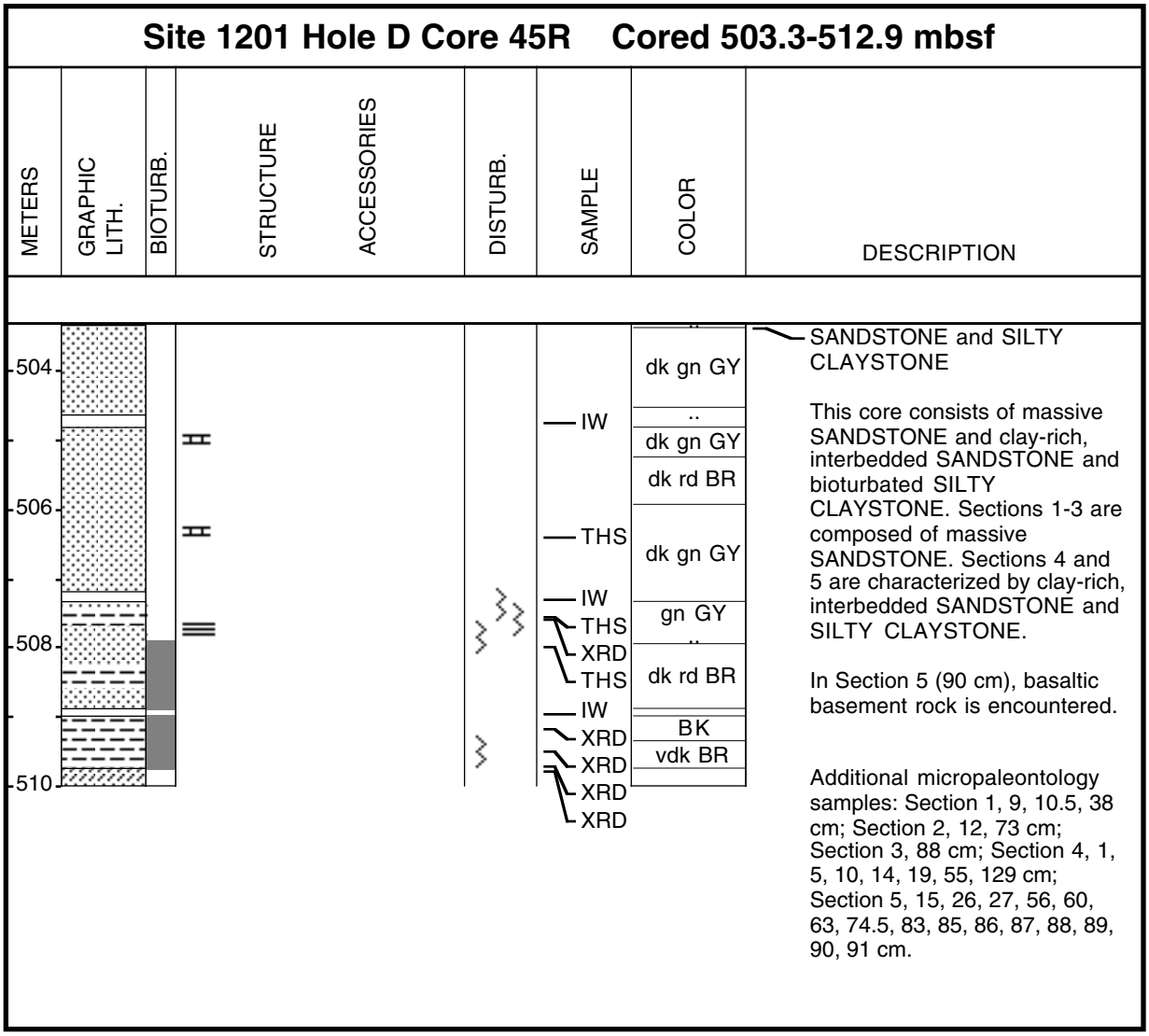
Core Photo


Site 1201 Hole D Core 43R Cored 484.1-493.7 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
486
488
490
THS
XRD
XRD
XRD
PAL
dk rd BR
dk rd BR
gy GN
ye RD
gy GN
rd BR
gy GN
gy GN
rd BR
gy GN
SANDSTONE and SILTY CLAYSTONE
This core consists of interbedded SANDSTONE and bioturbated SILTY CLAYSTONE with massive SANDSTONE and clay-rich intervals. Beds are largely defined by color changes.
Sandstone in interbedded intervals often exhibits planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 40 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive.

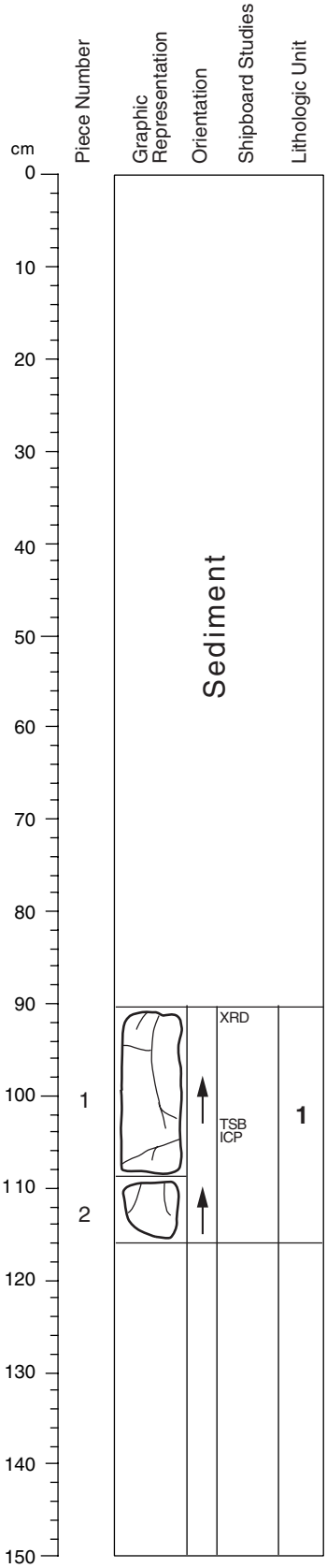
Core Photo


Site 1201 Hole D Core 44R Cored 493.7-503.3 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
494
496
498
500
502
IW
IW
IW
XRD
IW
PAL
XRD
PAL
dk gy GN
dk rd BR
SANDSTONE and SILTY CLAYSTONE
This core consists of interbedded SANDSTONE and bioturbated SILTY CLAYSTONE. Section 2 is clay-rich and the lowermost portion of Section 4 is characterized by cm-scale alternating grayish green and reddish brown color changes. Beds are largely defined by color changes.
Sandstone in interbedded intervals often exhibits planar, cross, wavy and rare trough cross laminations. Beds are cm- to dm-thick. Normally-graded intervals (5 to 40 cm in length) occur throughout the core. The basal contacts of graded intervals are sharp and erosive.

Core Photo


Site 1201 Hole D Core 45R Cored 503.3-512.9 mbsf
METERS
GRAPHIC LITH.
BIOTURB.
STRUCTURE
ACCESSORIES
DISTURB.
SAMPLE
COLOR
DESCRIPTION
504
506
508
510
IW
THS
IW
THS
XRD
THS
IW
XRD
XRD
XRD
XRD
dk gn GY
dk gn GY
dk rd BR
dk gn GY
gn GY
dk rd BR
BK
vdk BR
SANDSTONE and SILTY CLAYSTONE
This core consists of massive SANDSTONE and clay-rich, interbedded SANDSTONE and bioturbated SILTY CLAYSTONE. Sections 1-3 are composed of massive SANDSTONE. Sections 4 and 5 are characterized by clay-rich, interbedded SANDSTONE and SILTY CLAYSTONE.
In Section 5 (90 cm), basaltic basement rock is encountered.
Additional micropaleontology samples: Section 1, 9, 10.5, 38 cm; Section 2, 12, 73 cm; Section 3, 88 cm; Section 4, 1, 5, 10, 14, 19, 55, 129 cm; Section 5, 15, 26, 27, 56, 60, 63, 74.5, 83, 85, 86, 87, 88, 89, 90, 91 cm.

Core Photo



195-1201D-45R-5 (Section top: 508.86 mbsf)

Interval 0-91 cm is sediment.

ROCK NAME: Highly altered sparsely phyric basalt

UNIT: 1

Pieces: 1 and 2

Interval: 91-115 cm

CONTACTS: The contact to the overlying sedimentary sequence is located at 91 cm.

PHENOCRYSTS: Plagioclase (2%) observed in thin section.

GROUNDMASS: Fine-grained, spherulitic texture.

CAVITIES: Scattered, up to 5 mm irregular vesicles and former vesicles, now filled with secondary minerals, are seen throughout the pieces.

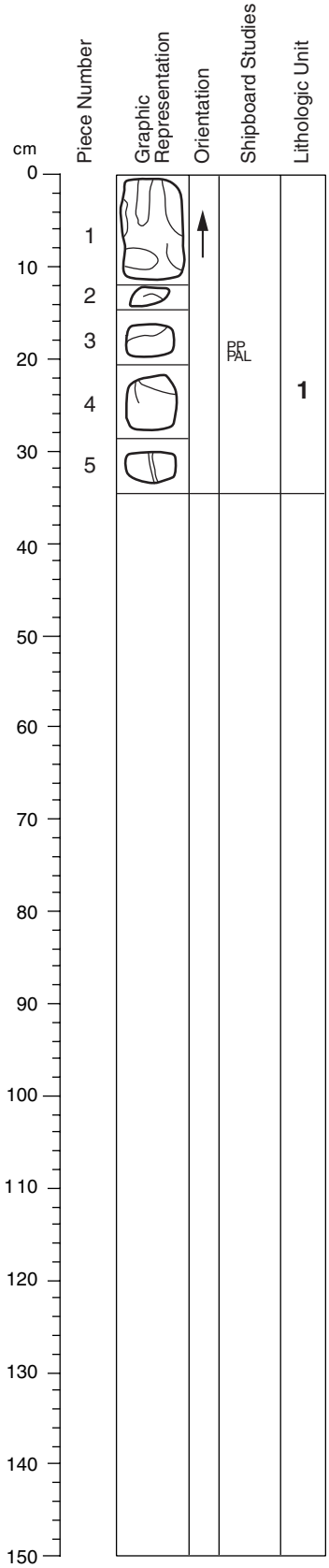
COLOR: Light gray (5Y 6/1).

STRUCTURE: Pillow lava(?). No pillow rims observed.

ALTERATION: Extensive: plagioclase is replaced by zeolites, alkali feldspars and/or carbonate. Olivine is replaced by iron hydroxides and zeolites. The glass matrix has devitrified to clay minerals and zeolites. Light brown halos occur around veins.

VEINS/FRACTURES: The core is cut by several veins variable in color from reddish to greenish to white. Reddish veins consist of sedimentary material with bioclasts(?). The white veins consist of carbonate introduced at a later stage.

Core Photo



195-1201D-45R-CC (Section top: 510.01 mbsf)

ROCK NAME: Very highly altered aphyric basalt

UNIT: 1

Pieces: 1-5

Interval: 0-35 cm

CONTACTS: None.

PHENOCRYSTS: No thin section is available, and none identified in core.

GROUNDMASS: Fine-grained.

CAVITIES: Scattered irregular vesicles up to 1 mm and some amygdules.

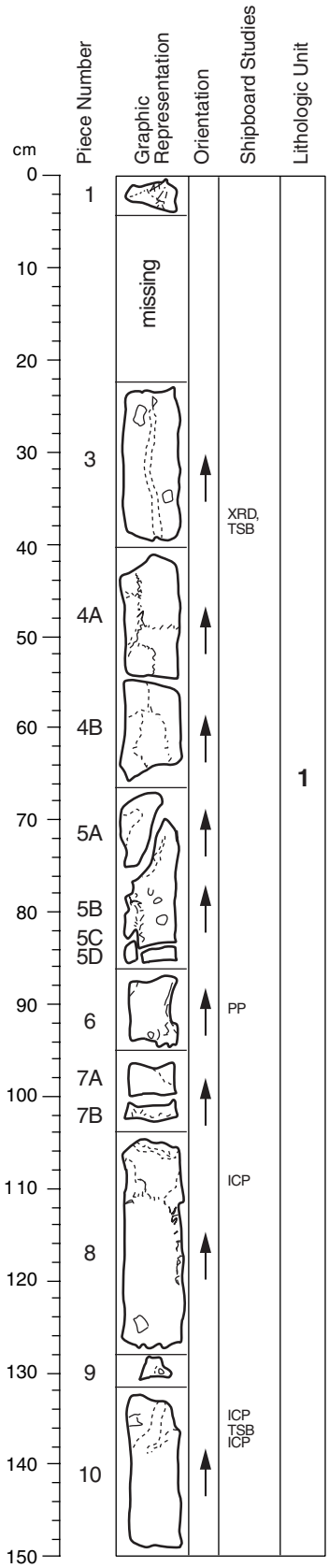
COLOR: Gray (N6) with patches of lighter colored material.

STRUCTURE: Pillow lava(?). No pillow rims observed.

ALTERATION: Extensive.

VEINS/FRACTURES: Several reddish brown veins crosscut the core. Piece 1 is cut by a very fine vein of a yellow crystalline mineral.

Core Photo



195-1201D-46R-1 (Section top: 512.90 mbsf)

ROCK NAME: Highly altered aphyric basalt

UNIT: 1

Pieces: 1-10

Interval: 0-150 cm

CONTACTS: None.

PHENOCRYSTS: None.

GROUNDMASS: Fine-grained and vesicular with subophitic texture observed in thin section.

CAVITIES: Highly vesicular in Piece 5. Remaining pieces have scattered vesicles, some of which are filled with secondary minerals, most commonly zeolites.

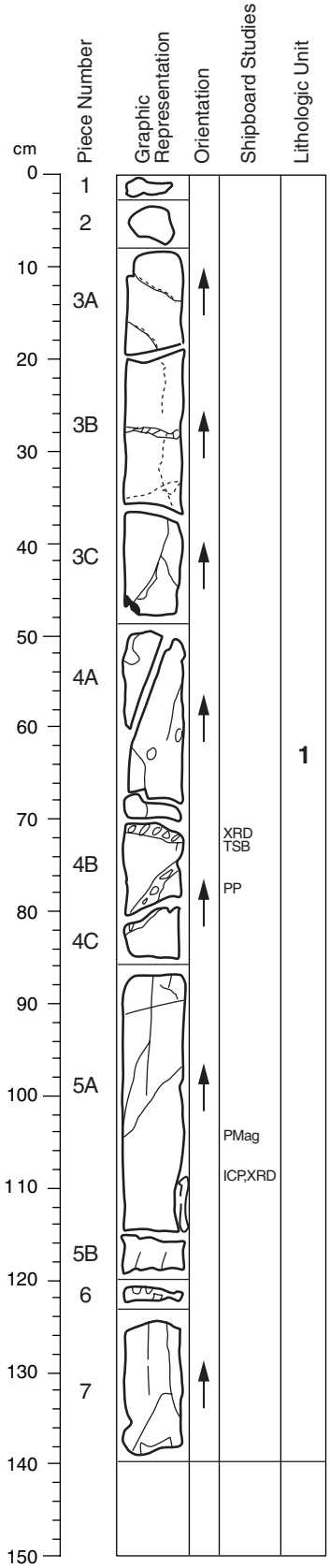
COLOR: Bluish gray (5B 5/1) with some patches of lighter colored material in Pieces 3, 5, 8, and 10.

STRUCTURE: Pillow lava. Piece 6 is a basaltic fragment which may show a poorly preserved pillow margin rim.

ALTERATION: Extensive. Plagioclase and olivine have primarily been replaced by zeolites and carbonate, and clay minerals replace original glassy matrix. The veins often have dark red linings and light brown alteration halos consisting of iron hydroxides (dark red) and clay minerals. Patches of lighter colored material may be caused by a higher degree of alteration.

VEINS/FRACTURES: Commonly fractured. Fractures are filled with reddish brown sedimentary material and in some places (e.g. Pieces 3 to 6) small, green, angular fragments of altered glass are also included. Some veins have late stage precipitation of carbonate.

Core Photo



195-1201D-46R-2 (Section top: 514.40 mbsf)

ROCK NAME: Highly altered sparsely plagioclase phyric basalt

UNIT: 1

Pieces: 1-7

Interval: 0-140 cm

CONTACTS: None.

PHENOCRYSTS: Plagioclase (2%) observed in thin section.

GROUNDMASS: Fine-grained, spherulitic texture observed in thin section.

CAVITIES: Vesicular throughout section, with some places dominated by coalesced vesicles. Some vesicles have been filled by secondary minerals, most commonly zeolites.

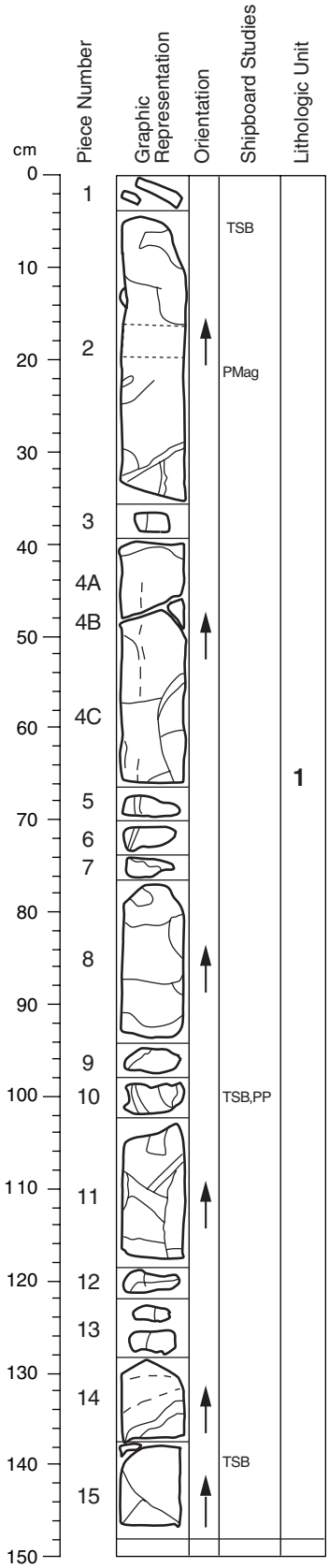
COLOR: Bluish gray (5B 5/1) with patches of lighter colored material in Pieces 2 to 4, and 7.

STRUCTURE: Pillow lava. Piece 6 may show hyaloclastite in a vein or a poorly preserved pillow margin rim.

ALTERATION: Extensive. Plagioclase is replaced by carbonate and zeolites, olivine is replaced by zeolites, iron oxyhydroxide, and clay minerals. The glassy matrix is replaced by zeolites and clay minerals. Reddish brown alteration halos around veins are common. Patches of lighter colored material are caused by a variation in the degree of alteration.

VEINS/FRACTURES: Fractures are common. Veins are filled with reddish brown material. In Piece 4, a 10-mm-wide vein has abundant fragments of green altered glass from the pillow margin rim embedded in the brownish material. Some veins have a late stage of carbonate precipitation.

Core Photo



195-1201D-46R-3 (Section top: 515.80 mbsf)

ROCK NAME: Very highly altered aphyric basalt

UNIT: 1

Pieces: 1-15

Interval: 0-148 cm

CONTACTS: None.

PHENOCRYSTS: None.

GROUNDMASS: Fine-grained. Hyalopilitic and spherulitic textures are common in thin section.

CAVITIES: Vesicles (up to 5 mm) are common throughout the section. Amygdules are filled by zeolites. Coalescing gas cavities form radiating patterns upsection in Piece 2.

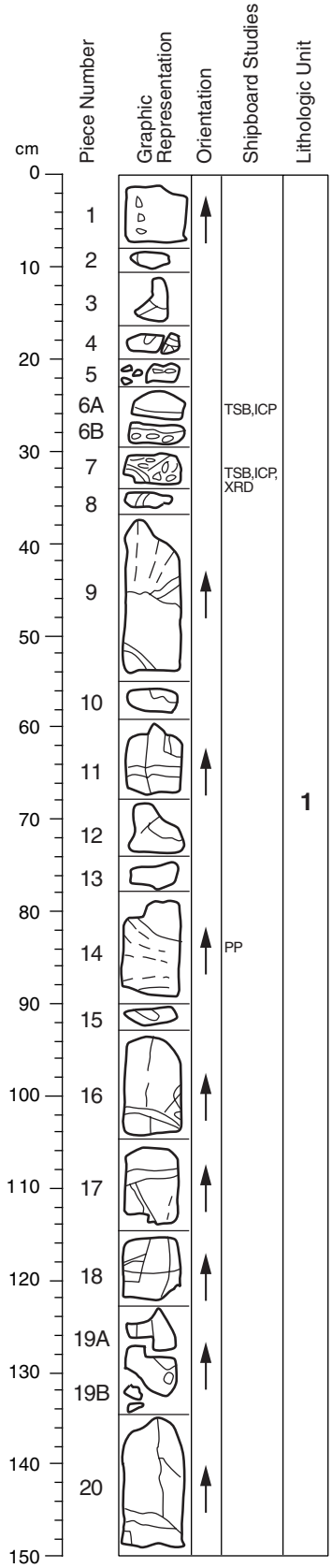
COLOR: Bluish gray (5B 6/1-5B 5/1). Several pieces (e.g., Pieces 2, 7, 8, 10, and 11) have lighter colored zones. Alteration halos have a reddish tint.

STRUCTURE: Pillow lava. Pieces 2 and 10 are probably clasts close to pillow margins.

ALTERATION: Extensive alteration. Glass matrix is devitrified to clay minerals showing spherulitic texture. Plagioclase is completely replaced by zeolites in some places, and olivine may be replaced by zeolites and iron oxyhydroxide. Alteration halos around veins are common.

VEINS/FRACTURES: Fractures are reddish brown and less than 3 mm in width. Larger fractures have included angular, greenish, brecciated fragments, perhaps originating from the glassy pillow rims. Some veins (e.g., in Pieces 14 and 15) have late stage precipitation of carbonate.

Core Photo



195-1201D-46R-4 (Section top: 517.26 mbsf)

ROCK NAME: Highly altered aphyric basalt

UNIT: 1

Pieces: 1-20

Interval: 0-150 cm

CONTACTS: None.

PHENOCRYSTS: None.

GROUNDMASS: Fine-grained. Textures observed in thin section are spherulitic and vesicular.

CAVITIES: Irregular shaped vesicles are scattered throughout the section. Amygdules are often filled by zeolites and clay minerals observed in thin section.

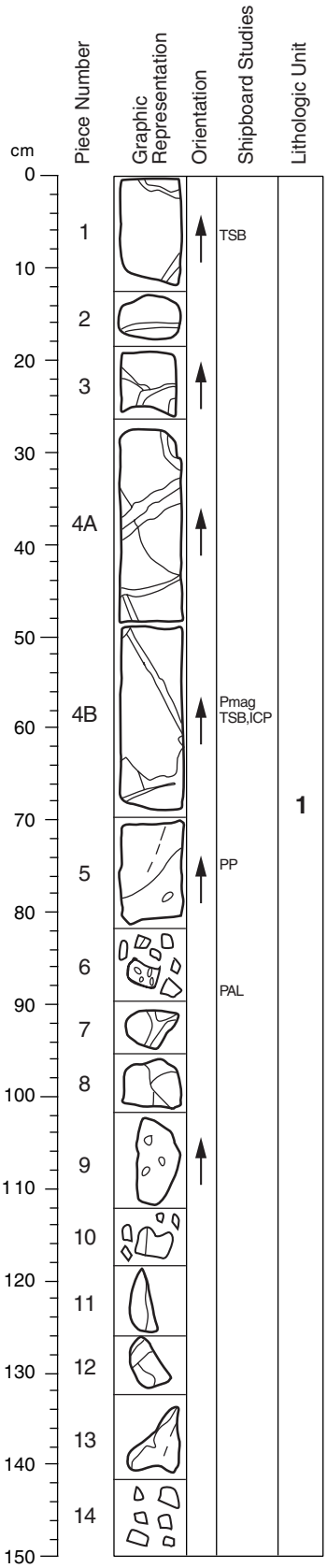
COLOR: Bluish gray (5B 6/1). Light greenish gray (5GY 7/1) patches occur in Pieces 14, 15, and 18.

STRUCTURE: Pillow lava. Pillow margin rims occur on Pieces 4 to 7, 12, and 16.

ALTERATION: Extensive. Plagioclase is replaced by zeolites and alkali feldspar(?), olivine is replaced by zeolites, clay minerals and iron oxyhydroxide. The glassy matrix is replaced by clay minerals(?), and zeolites(?). Lighter colored patches are due to a higher degree of alteration.

VEINS/FRACTURES: The majority of pieces are veined commonly with a brownish material and some veins exhibit dark red margins. Wider veins have small, angular, green fragments of pillow rim material(?). Some veins have late stage precipitation of carbonate.

Core Photo



195-1201D-46R-5 (Section top: 518.76 mbsf)

ROCK NAME: Very highly altered aphyric basalt

UNIT: 1

Pieces: 1-14

Interval: 0-150

CONTACTS: None.

PHENOCRYSTS: None.

GROUNDMASS: Fine-grained. Spherulitic and intersertal textures were observed in thin section.

CAVITIES: Vesicles are most common in the lower part of the section beneath 70 cm. Amygdules observed in thin section are filled by zeolites and clay minerals.

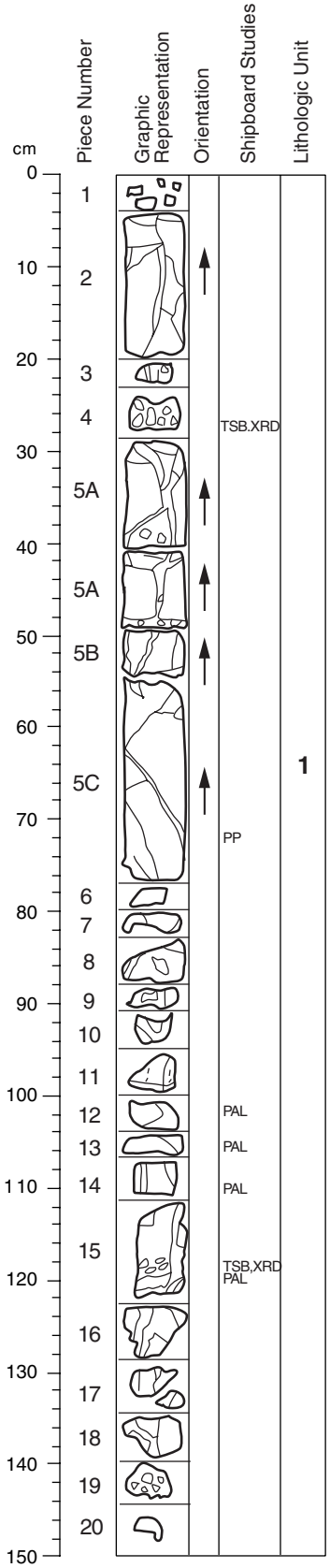
COLOR: Bluish gray (5B 5/1) in the top of the section grading to lighter bluish gray (5B 6/1) in the bottom part. Pieces 1 and 7 have patches of lighter colored material.

STRUCTURE: Pillow lava. Pieces in Piece 6 may be fragments from a pillow margin rim, where green, angular fragments of altered glass are embedded in a fine-grained reddish brown matrix of interpillow sediment.

ALTERATION: Extensive. Plagioclase is replaced by zeolites, carbonate and alkali feldspar(?). Olivine is replaced by clay minerals(?), and iron oxyhydroxide. The glassy groundmass has devitrified to zeolites(?) and clay minerals(?). Pieces 3 to 4B have brownish iron oxyhydroxide halos around veins.

VEINS/FRACTURES: Common. Veins consist of fine-grained brownish material. In Pieces 1 to 4B the veins have dark red margins and lighter colored halos.

Core Photo



195-1201D-47R-1 (Section top: 522.1 mbsf)

ROCK NAME: Highly altered aphyric basalt

UNIT: 1

Pieces: 1-20

Interval: 0-150 cm

CONTACTS: None.

PHENOCRYSTS: No thin sections from the basaltic intervals have been made. No phenocrysts have been observed in the core section.

GROUNDMASS: Fine-grained.

CAVITIES: Vesicles are scattered throughout the core. Pieces 8 to 11, and 18 are located near pillow margins and all exhibit more abundant vesicles.

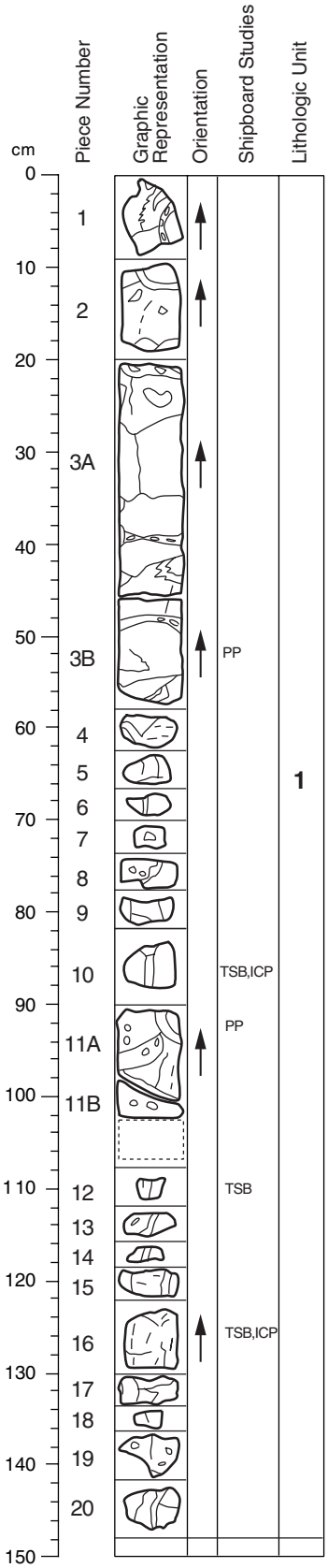
COLOR: The color of the basalt is generally bluish gray (5B 5/1) but varies slightly. Piece 1 contains fragments of brown (10YR 4/3) sedimentary material that resembles material found above the basalt-sediment contact and may be infill or sediment trapped among pillows, but unaffected by their cooling. Pieces 12 to 15 have yellowish brown (10YR 5/4) interpillow sediments with dark red margins against dark green volcanic glass of the pillow rims. The sedimentary material resembles the material seen in fractures and veins in the pillows.

STRUCTURE: Pillow lava. Pieces 4, 6, and 19 consist of hyaloclastite with large, green to brown, angular fragments embedded in a reddish sedimentary matrix. Pieces 12 to 15 are sedimentary and hyaloclastite fragments. Pieces 7, 8, and 11 have chilled margins.

ALTERATION: Extensive. Pieces at pillow margins seem to be more altered. Pieces 8 to 10, 17, and 19 have patches of lighter colored material presumably due to a higher degree of alteration.

VEINS/FRACTURES: The pieces are highly fractured and fractures and veins are filled by brownish material with red rims in some places. Some wider fractures contain angular fragments of altered pillow rim glass.

Core Photo



195-1201D-47R-2 (Section top: 523.60 mbsf)

ROCK NAME: Highly altered sparsely-moderately plagioclase-olivine phyric basalt

UNIT: 1

Pieces: 1 to 20

Interval: 0-148 cm

CONTACTS: None.

PHENOCRYSTS: Phenocrysts of olivine (<1%) and plagioclase (2%) have been observed in thin section.

GROUNDMASS: Fine-grained. Hyalopilitic and amygdaloidal textures have been observed in thin section.

CAVITIES: Vesicles are common throughout the section, variable from round to irregular in shape. The thin sections exhibit amygduloidal textures. Amygdules are commonly filled by zeolites, and clay minerals(?).

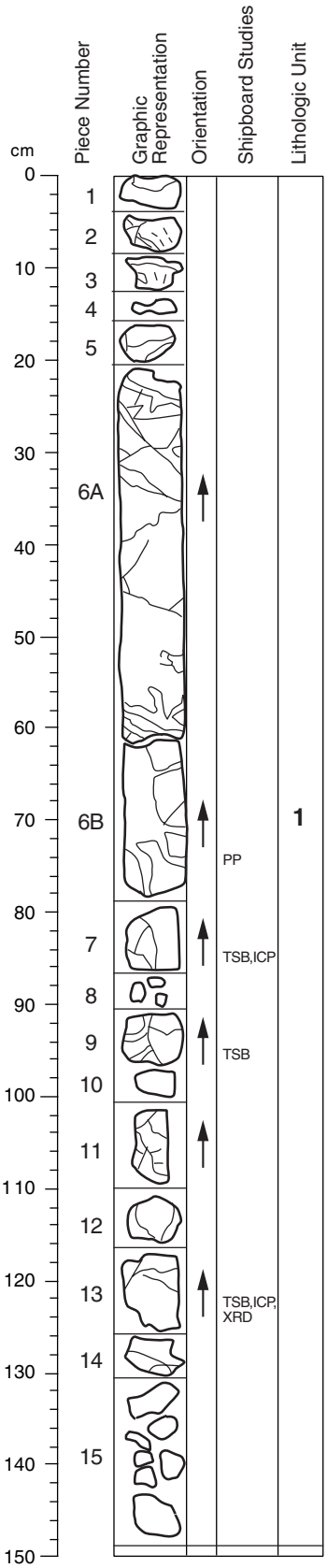
COLOR: Mostly bluish gray (5B 6/1 to 5B 5/1), some areas are slightly lighter colored.

STRUCTURE: Pillow lava. Pieces 4 and 5 have pillow margin rims.

ALTERATION: Extensive. Plagioclase has been replaced by carbonate, zeolites, alkali feldspar(?), and clay minerals(?). Olivine has been replaced by zeolites(?), clay minerals(?) and iron oxyhydroxides. Glass has been replaced by clay minerals(?), and opaque minerals(?). Alteration halos around veins are common leaving a brownish trace to the basaltic groundmass. Piece 1 is highly altered to a very fine-grained, clay-like matrix observed in hand specimen. Areas of lighter color are caused by a higher degree of alteration.

VEINS/FRACTURES: Highly fractured. Veins and fractures have been filled by a brownish sedimentary material. In some places there are late stage precipitation of carbonates in the veins. Wider fractures or veins (e.g., Pieces 1, 3, 10, and 17) contain angular, green fragments of hyaloclastite embedded in the sedimentary material.

Core Photo



195-1201D-47R-3 (Section top: 525.08 mbsf)

ROCK NAME: Completely altered sparsely plagioclase phyric basalt

UNIT: 1

Pieces: 1-15

Interval: 0-149 cm

CONTACTS: None.

PHENOCRYSTS: Plagioclase (up to 3%) and olivine (<1%) observed in thin section.

GROUNDMASS: Fine-grained. Textures observed in thin section are intersertal and felty.

CAVITIES: Vesicles are scattered throughout the section. Amygdules are filled by white secondary minerals. Carbonate and zeolites have been determined by thin section identification.

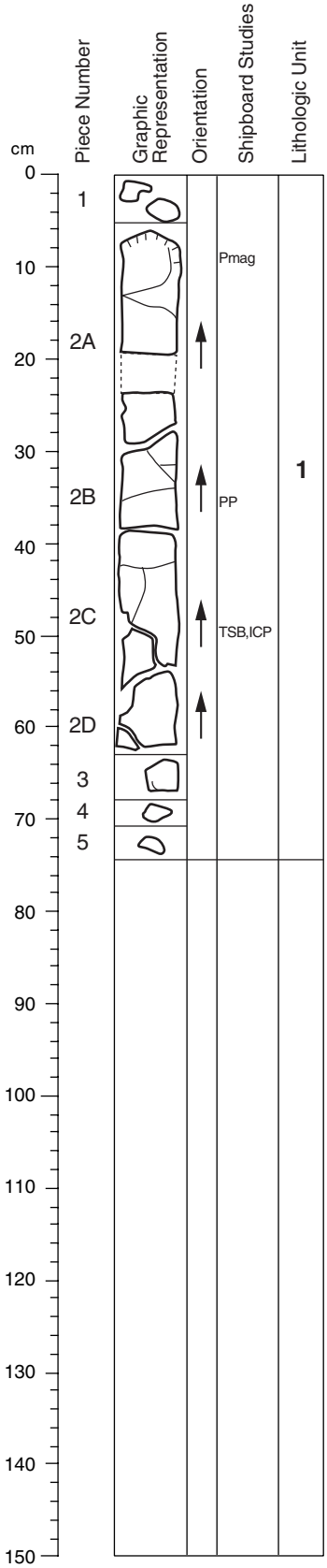
COLOR: Basalts are bluish gray (5B 6/1). Interpillow sedimentary material is brownish yellow to yellowish brown (10YR 6/6 to 10YR 5/4).

STRUCTURE: Pillow lava and pillow breccia. Pillow lava rims are preserved on Pieces 1 to 4, 8, and 11. In Pieces 5 and 6 fragments of basalt are brecciated and cemented along with darker brown sedimentary material.

ALTERATION: Extensive. In places basalt is almost completely altered. Olivine is altered to green clay minerals(?) and iron oxyhydroxides, or carbonate. The plagioclase is replaced most commonly by clay minerals(?) and zeolites, and rarely by alkali feldspar in addition to one or more of the above minerals. The alteration products of glass include clay minerals(?) and sometimes carbonate.

VEINS/FRACTURES: The section is highly fractured. Veins consist of a brownish sedimentary material, and some have dark red rims and lighter brown alteration halos. Vein and fracture material are both overprinted by a late stage precipitation of carbonate. Pieces 10 and 12 have no veins.

Core Photo



195-1201D-48R-1 (Section top: 531.70 mbsf)

ROCK NAME: Highly altered sparsely plagioclase phyric basalt

UNIT: 1

Pieces: 1-5

Interval: 0-74 cm

CONTACTS: None.

PHENOCRYSTS: Plagioclase (1%).

GROUNDMASS: Fine-grained. The texture in thin section is felty and branching, suggesting that the basalt cooled quickly but was not quenched as in previous sections, where the groundmass is more dominated by devitrified glass.

CAVITIES: Only few vesicles observed in hand specimen.

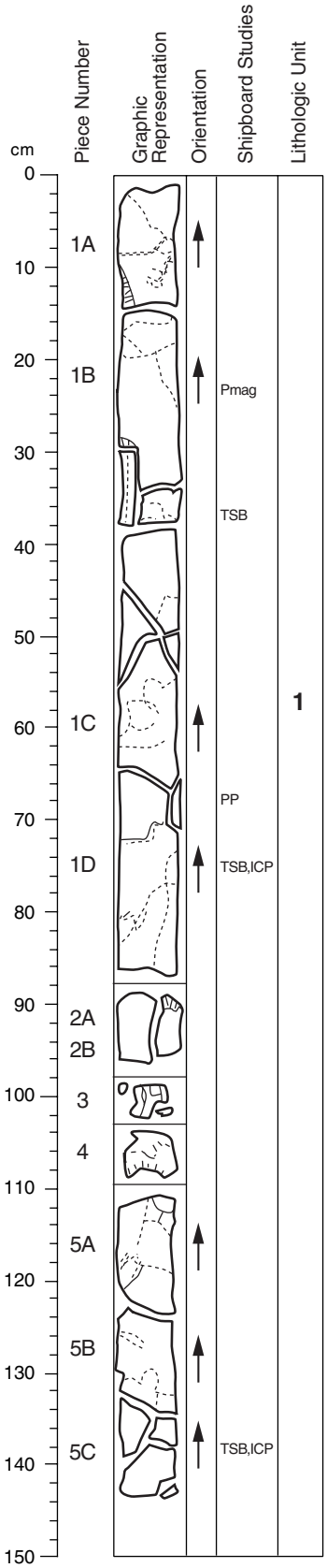
COLOR: Bluish gray (5B 6/1). Large alteration halos around veins are gray (5Y 6/1).

STRUCTURE: Pillow lava. Piece 1 is altered glassy pillow rim or hyaloclastite. The bottom edge of Piece 2 has a glassy rim. Piece 5 is interpillow sedimentary material, with a dark red margin and small, green, angular fragments, presumably altered glass.

ALTERATION: Extensive. Plagioclase has been partially replaced by clay minerals(?), zeolites, and sometimes alkali feldspar. Olivine has been replaced completely by carbonate, clay minerals(?) and iron oxyhydroxides. Glass has devitrified to clay minerals(?). The thin veins in Piece 2 have late stage precipitated carbonate.

VEINS/FRACTURES: Veins in Piece 2 are very thin and have large, lighter brown, alteration halos. Pieces 3 and 4 have no veins or fractures.

Core Photo



195-1201D-48R-2 (Section top: 532.44 mbsf)

ROCK NAME: Very highly altered sparsely plagioclase phyric basalt

UNIT: 1

Pieces: 1-5

Interval: 0-150 cm

CONTACTS: None.

PHENOCRYSTS: Plagioclase (2%) observed in thin section was too small to be detected visually. In hand specimen, few completely altered olivine phenocrysts were observed scattered throughout the section.

GROUNDMASS: Fine-grained with mainly intersertal, subophitic, and branching textures observed in thin section.

CAVITIES: Most frequent in the lower part of the section, but generally not abundant.

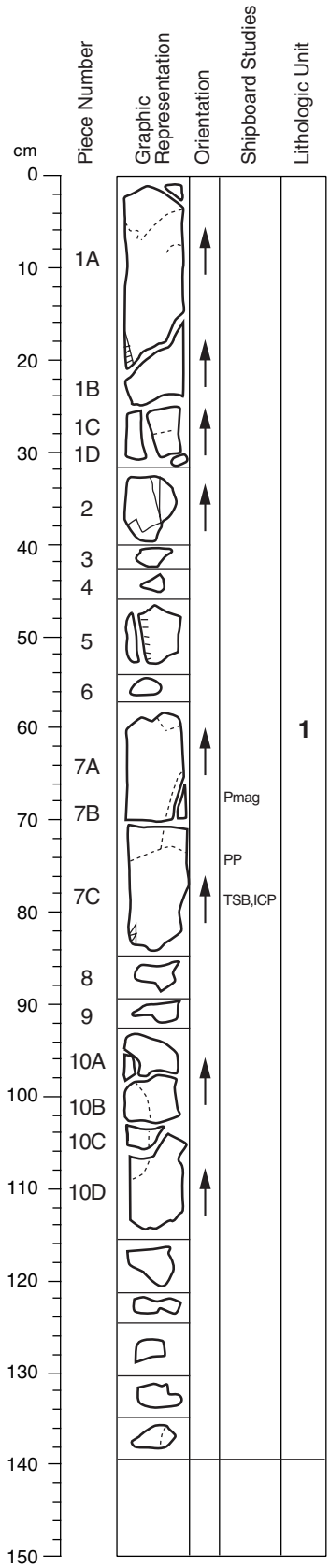
COLOR: Bluish gray (5B 6/1).

STRUCTURE: Pillow lava. Piece 1 has evidence of pillow rim material and chilled margin at the top of the piece. Piece 3 is a hyaloclastite. Piece 4 also has a remnant of a pillow margin rim.

ALTERATION: Extensive. Plagioclase has been replaced partially by clay minerals(?), zeolites(?), and alkali feldspar(?). Olivine has been replaced by green clay minerals, carbonate and iron oxyhydroxides. The glass matrix has devitrified to clay minerals(?) and zeolites(?). Wide alteration halos around veins are common.

VEINS/FRACTURES: Veins in Piece 1 are thin (<1 mm) in the central part, and tend to get wider near the bottom of the piece. Piece 3 is cut by veins containing a brown material and dark green angular fragments of volcanic glass, probably derived from hyaloclastite. The width of the veins is more variable in Piece 5, ranging from <1 mm to 10 mm. Veins are filled by a yellowish brown material and often have dark red rims. Some thin veins in Piece 5 are completely dark red. Late stage precipitation of carbonate in the veins is common.

Core Photo



195-1201D-48R-3 (Section top: 533.94 mbsf)

ROCK NAME: Highly altered moderately plagioclase-olivine phyric basalt

UNIT: 1

Pieces: 1-15

Interval: 0-140 cm

CONTACTS: None.

PHENOCRYSTS: Plagioclase is partially preserved. Olivine is completely altered as observed in thin section totaling 3%.

GROUNDMASS: Fine-grained. Textures observed in thin section are spherulitic, branching, intersertal and hyalopilitic.

CAVITIES: Scattered throughout section, but very small. Some are filled by a white non-calcareous secondary mineral, presumably zeolites, but this is not confirmed in the thin section.

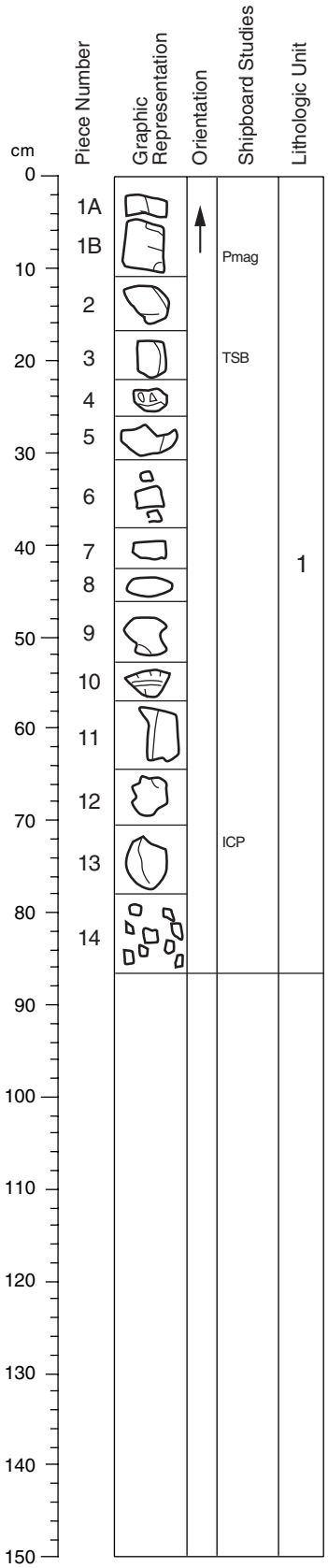
COLOR: Bluish gray (5B 6/1).

STRUCTURE: Pillow lava. Pillow rims are observed on Pieces 1, 2, 7, 8, and 10.

ALTERATION: Extensive. Plagioclase is replaced by clay minerals(?). Olivine is replaced by clay minerals(?), zeolites(?), and carbonate. Glass is devitrified to clay minerals(?), and zeolites(?). The fine veins have wide (up to 20 mm) diffuse alteration halos.

VEINS/FRACTURES: Generally very thin veins (<<1 mm). Some veins have late stage precipitation of carbonate. Veins in Piece 2 are 2 mm wide and consists of a dark brown material. Piece 5 is presumably a fragment, 10 mm wide, of brown, fine-grained, vein material.

Core Photo



195-1201D-48R-4 (Section top: 535.34 mbsf)

ROCK NAME: Highly altered sparsely plagioclase phyric basalt

UNIT: 1

Pieces: 1-14

Interval: 0-87 cm

CONTACTS: None.

PHENOCRYSTS: Few, generally altered plagioclase phenocrysts (1%) observed in thin section. In hand specimen few altered olivine phenocrysts were observed.

GROUNDMASS: Fine-grained. Textures observed in thin section are spherulitic and intersertal.

CAVITIES: Few filled with secondary minerals including carbonate observed in hand specimen and clay minerals observed in thin section.

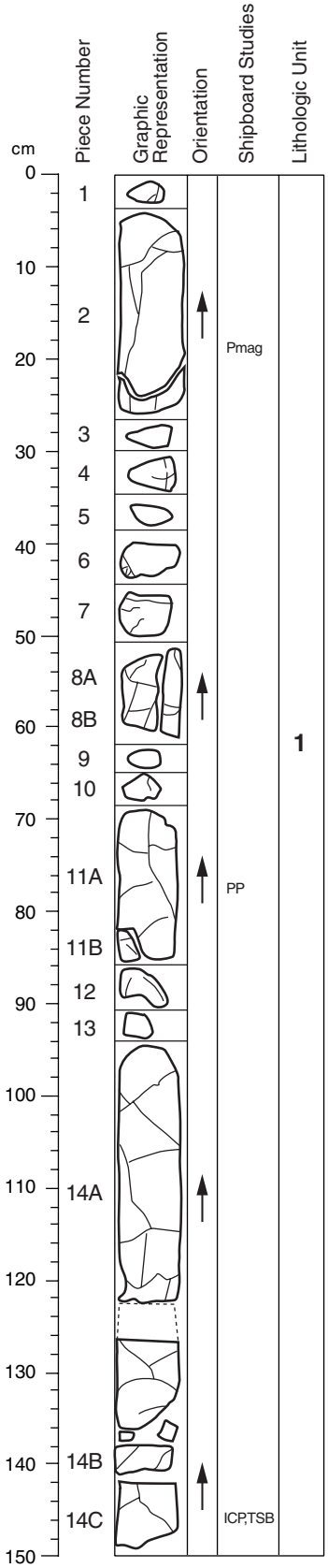
COLOR: Bluish gray (5B 6/1).

STRUCTURE: Pillow lava. Pieces 1 to 3, 5, 6, and fragments in Piece 14 have pillow rims preserved. Piece 2 has an exceptionally well preserved, 10-mm-wide, glass pillow rim. Piece 4 is a hyaloclastite made up of angular, green, glassy fragments lying in a brown, very fine-grained matrix.

ALTERATION: Extensive. Plagioclase has been replaced by clay minerals(?) and in few specimens also iron oxyhydroxides. Olivine has been replaced by iron oxyhydroxides and clay minerals(?). Glass has been replaced by clay minerals(?).

VEINS/FRACTURES: Only few veins, most pieces are without veins. Veins in Piece 10 are filled by a brown material and have dark red rims.

Core Photo



195-1201D-49R-1 (Section top: 541.30 mbsf)

ROCK NAME: Very highly altered sparsely plagioclase phyric basalt

UNIT: 1

Pieces: 1-14

Interval: 0-150 cm

CONTACTS: None.

PHENOCRYSTS: Altered plagioclase (1%) and olivine (<1%) phenocrysts are present in thin section.

GROUNDMASS: Fine-grained. Textures in thin section are branching and intersertal.

CAVITIES: Scattered and not visually abundant. In thin section vesicles are filled with carbonate and zeolites are rimmed by clay minerals.

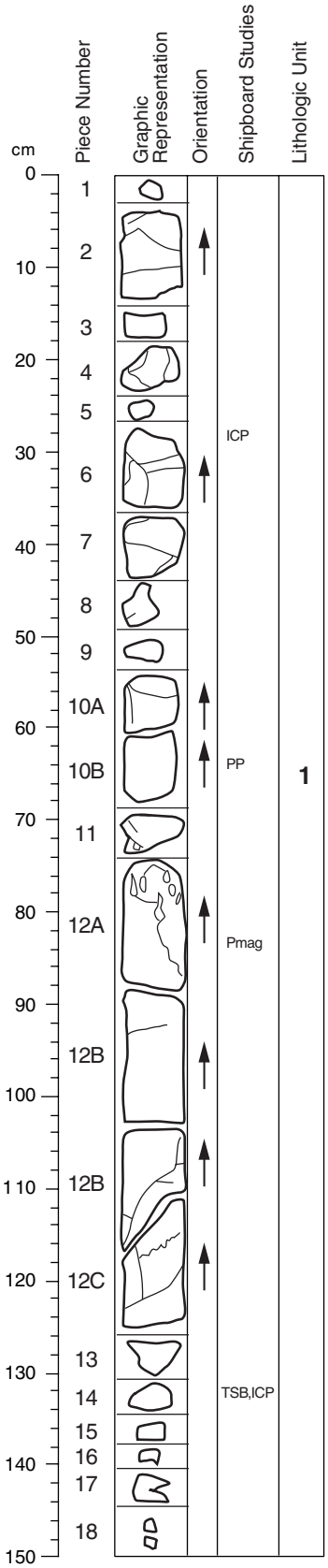
COLOR: Bluish gray (5B 6/1).

STRUCTURE: Pillow lava. Piece 8 has a preserved pillow rim, and Piece 6 may have a poorly preserved pillow margin.

ALTERATION: Extensive. Plagioclase has been replaced by clay minerals(?). Olivine has been replaced by clay minerals(?), iron oxyhydroxides, and carbonate. Alteration halos around veins are most pronounced along the thin veins, where they are up to 30 mm wide, whereas they are not developed around wider veins.

VEINS/FRACTURES: Thin veins (<1 mm) are observed in Pieces 2, 8, and 14, some of which have late stage precipitated carbonate. Piece 11 has a wider (2 mm) vein of a brownish material, which includes patches of precipitated carbonate. Piece 14 shows a fracture pattern resembling that which arises from thermal contraction, with carbonate precipitated in fractures.

Core Photo



195-1201D-49R-2 (Section top: 542.80 mbsf)

ROCK NAME: Very highly altered sparsely plagioclase phyric basalt

UNIT: 1

Pieces: 1-18

Interval: 0-150 cm

CONTACTS: None.

PHENOCRYSTS: Plagioclase phenocrysts (1%) are observed in thin section. Few scattered, completely altered olivine phenocrysts are visible in hand specimen.

GROUNDMASS: Fine-grained. The textures observed in thin section are branching, intersertal, and spherulitic.

CAVITIES: Very small, hardly noticeable in hand specimen. In thin section amygdules filled by carbonate are observed.

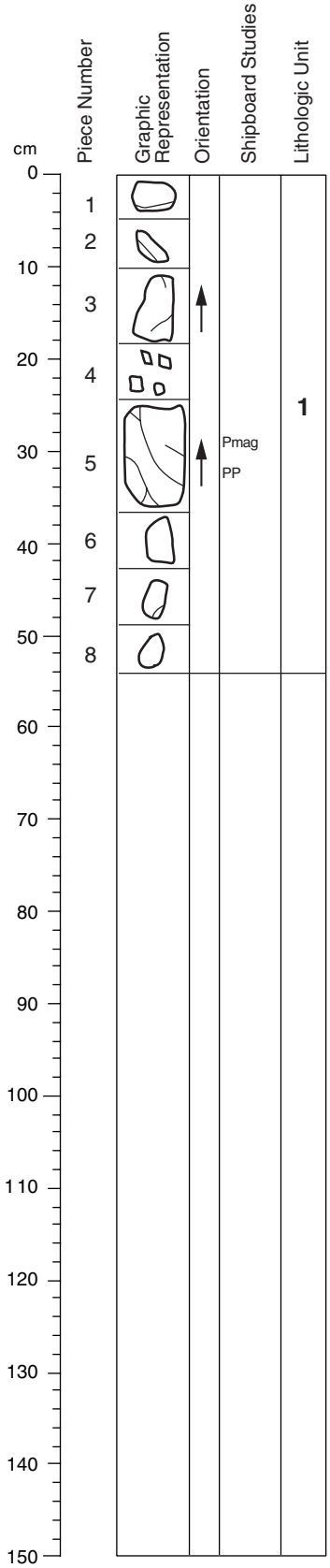
COLOR: Bluish gray (5B 6/1). Gray (5Y 6/1) in alteration halos around veins.

STRUCTURE: Pillow lava. Piece 7 has a remnant of altered, glassy pillow margin rim.

ALTERATION: Extensive. Plagioclase has been replaced by clay minerals(?), and larger grains also by carbonate. Olivine has been replaced by clay minerals(?) and carbonate. The glassy groundmass has been replaced by clay minerals(?). Wide alteration halos are present around the fine veins and fractures are common.

VEINS/FRACTURES: Fractures and veins are generally thin throughout section (<1 mm). Some are filled by brownish material and some have late stage precipitation of carbonate. Pieces 11 and 12 have blebs of carbonate.

Core Photo



195-1201D-49R-3 (Section top: 544.30 mbsf)

ROCK NAME: Highly altered aphyric basalt

UNIT: 1

Pieces: 1-8

Interval: 0-54 cm

CONTACTS: None.

PHENOCRYSTS: None visible in hand specimen. No thin sections have been made in this section.

GROUNDMASS: Fine-grained.

CAVITIES: None obvious in hand specimen.

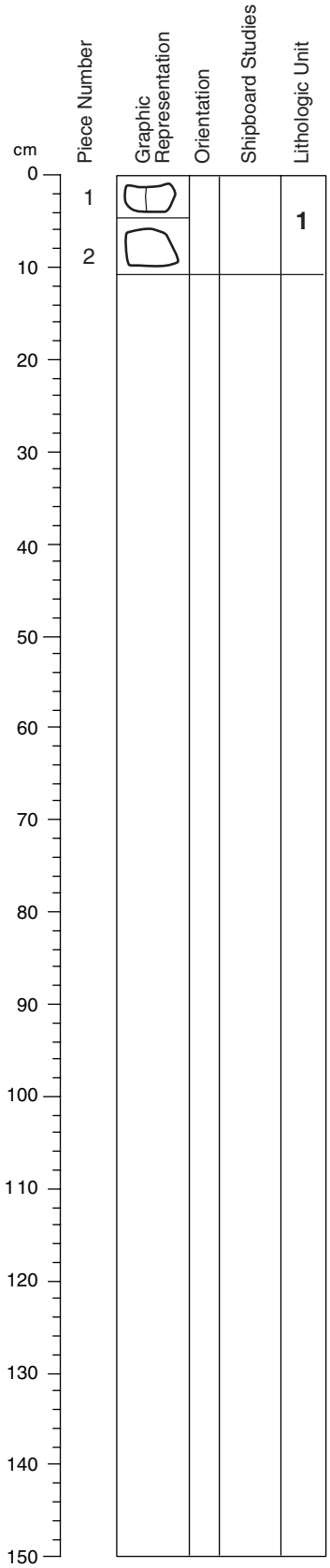
COLOR: Bluish gray (5B 6/1).

STRUCTURE: No pillow lava margins observed.

ALTERATION: Extensive.

VEINS/FRACTURES: Thin veins are observed in Pieces 1, 2, and 5, consisting of brownish material with dark red rims, and large alteration halos. Veins in Piece 5 have a late stage carbonate precipitation.

Core Photo



195-1201D-50R-1 (Section top: 550.30 mbsf)

ROCK NAME: Very highly altered aphyric basalt

UNIT: 1

Pieces: 1-2

Interval: 0-11 cm

CONTACTS: None.

PHENOCRYSTS: None visible in hand specimen. No thin sections have been made in this section.

GROUNDMASS: Fine-grained.

CAVITIES: Few, very small vesicles are filled with secondary minerals.

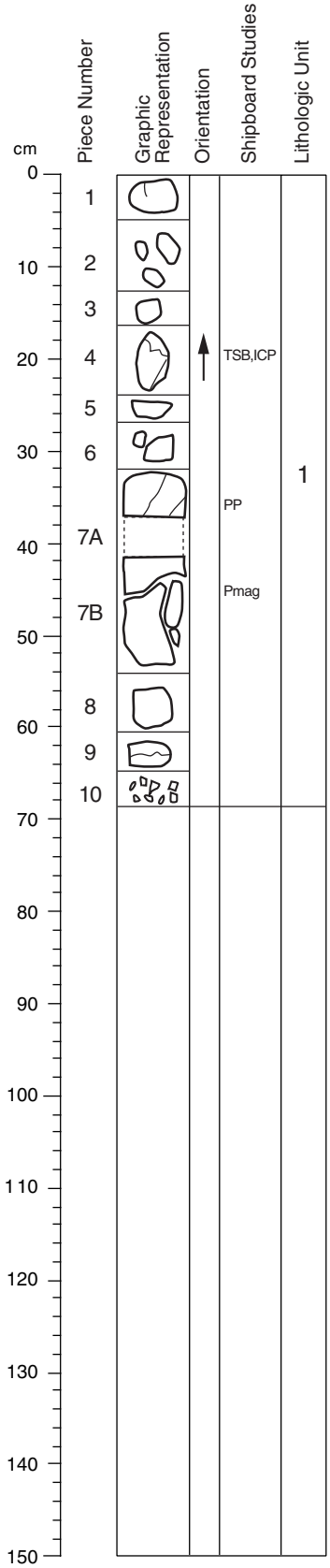
COLOR: Bluish gray (5B 6/1).

STRUCTURE: No pillow lava margins observed.

ALTERATION: Extensive.

VEINS/FRACTURES: One very thin vein in Piece 1 is filled with carbonate.

Core Photo



195-1201D-51R-1 (Section top: 554.0 mbsf)

ROCK NAME: Very highly altered aphyric basalt

UNIT: 1

Pieces: 1-10

Interval: 0-69 cm

CONTACTS: None.

PHENOCRYSTS: None.

GROUNDMASS: Fine-grained. Spherulitic, branching, intergranular, and subophitic textures are observed in thin section.

CAVITIES: None visible.

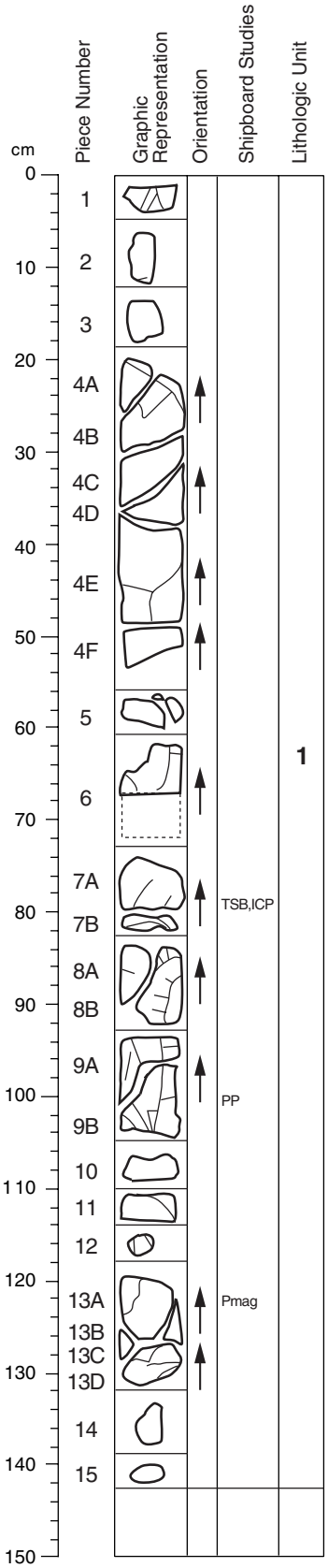
COLOR: Bluish gray (5B 6/1). Some parts show more reddish brown tint due to oxidation.

STRUCTURE: Pillow lava(?). No pillow lava margins observed.

ALTERATION: Extensive. Most commonly along rims of clasts, and oxidation patches in some parts. Plagioclase, olivine and glass have all been replaced by clay minerals.

VEINS/FRACTURES: Few veins. Piece 7 has a thin vein with late stage carbonate precipitation.

Core Photo



195-1201D-52R-1 (Section top: 560.7 mbsf)

ROCK NAME: Very highly altered aphyric basalt

UNIT: 1

Pieces: 1-15

Interval: 0-143 cm

CONTACTS: None.

PHENOCRYSTS: None observed.

GROUNDMASS: Fine-grained. Spherulitic, branching, intergranular, and subophitic textures were observed in thin section.

CAVITIES: Small vesicles scattered throughout section, commonly filled by secondary minerals.

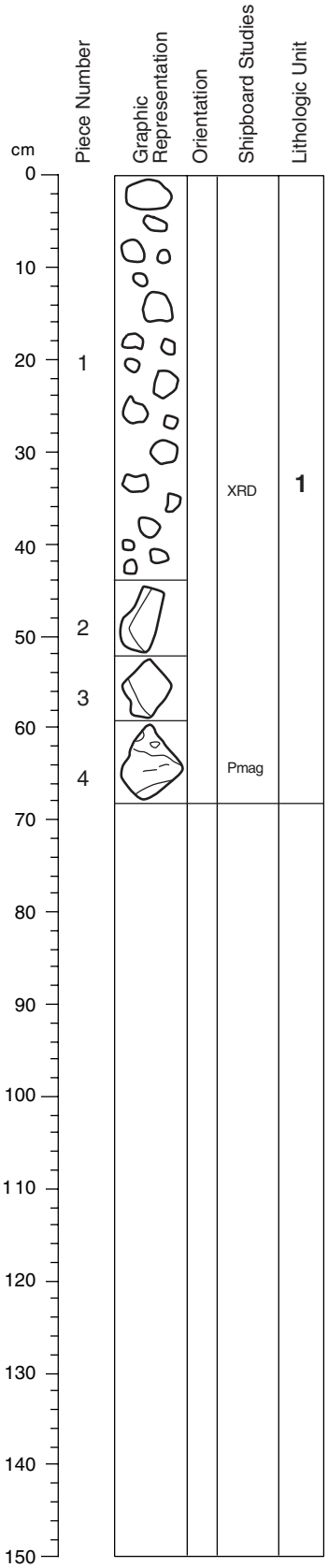
COLOR: Bluish gray (5B 6/1).

STRUCTURE: Pillow lava. Pillow margin rim observed on Piece 4.

ALTERATION: Extensive. Plagioclase and olivine have been replaced by clay minerals(?), and large plagioclase laths have also been replaced by carbonate. Glass has devitrified to clay minerals(?) and zeolites(?). Wide alteration halos around the veins are common.

VEINS/FRACTURES: Thin veins (<1 mm) are common. They often follow an irregular path and are variable in width. Some are filled by a reddish brown material, others by a darker brown material.

Core Photo



195-1201D-52R-2 (Section top: 562.13 mbsf)

ROCK NAME: Very highly altered aphyric basalt

UNIT: 1

Pieces: 1-4

Interval: 1-68 cm

CONTACTS: None.

PHENOCRYSTS: Few observed in Piece 4 in hand specimen. No thin section has been made from this section.

GROUNDMASS: Fine-grained.

CAVITIES: None visually obvious.

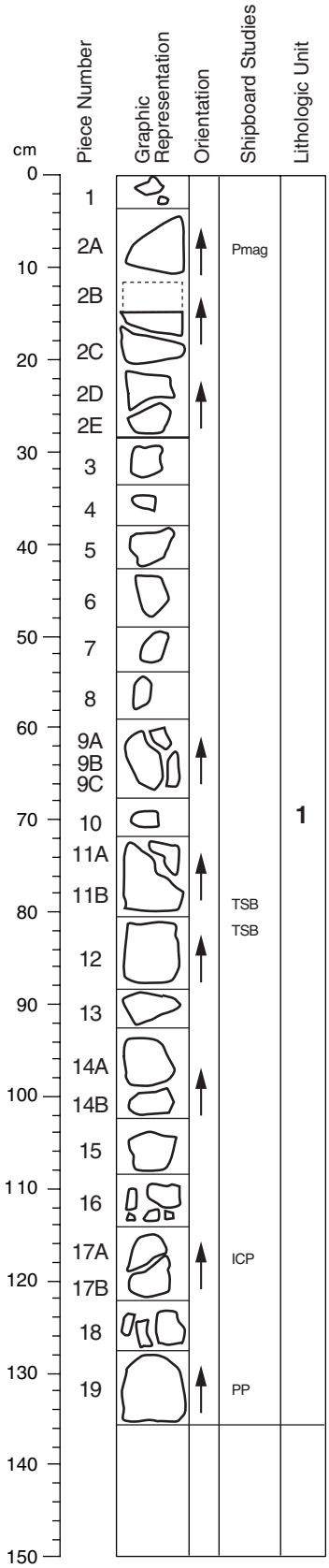
COLOR: Bluish gray (5B 6/1). Brownish alteration halos along the rim of the clasts are common.

STRUCTURE: Pillow lava. Piece 1 contains several fragments, one of which is interpillow sedimentary material.

ALTERATION: Alteration halos along rims of the clasts.

VEINS/FRACTURES: Piece 4 has a thin (1 mm) vein of reddish brown material, and late stage precipitation of carbonate.

Core Photo



195-1201D-53R-1 (Section top: 570.30 mbsf)

ROCK NAME: Highly altered sparsely plagioclase phyric basalt

UNIT: 1

Pieces: 1-19

Interval: 0-135 cm

CONTACTS: None.

PHENOCRYSTS: Few scattered phenocrysts of olivine are observed in hand specimen. Up to 2% highly altered plagioclase phenocrysts are observed in thin section.

GROUNDMASS: Fine-grained. Textures observed in thin section are intersertal, felty, branching, subophitic, and glomeroporphyritic.

CAVITIES: Very vesicular. Vesicles are commonly filled with white and green, secondary minerals, some of which are carbonate. Zeolites have been identified in thin section.

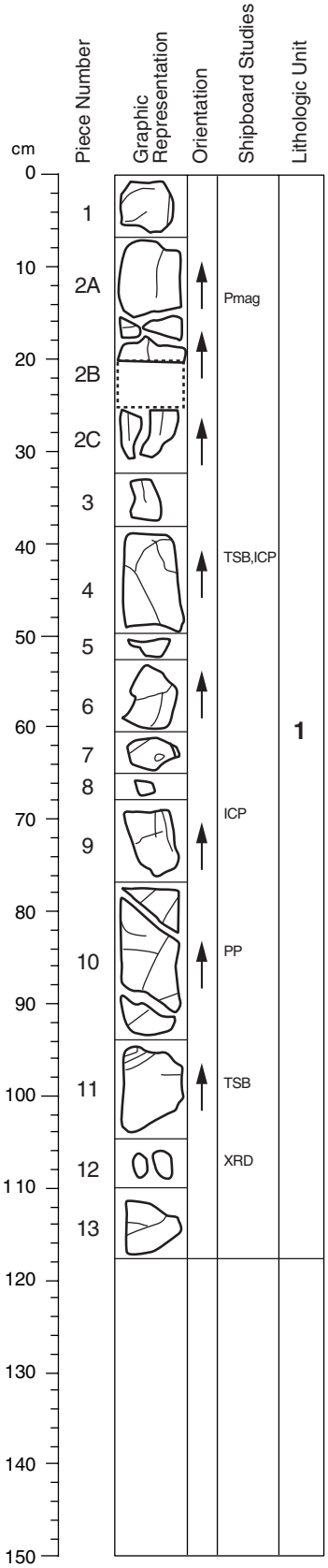
COLOR: Variable. The upper part of the section is bluish gray (5B 6/1) grading to gray (N5) in the lower part. Alteration halos around veins have a reddish brown tint.

STRUCTURE: Pillow lava. Pillow lava rims are observed on Piece 3 and maybe also on Pieces 4 and 5.

ALTERATION: Extensive. Plagioclase has been replaced by alkali feldspar, zeolites, and clay minerals(?). Olivine has been replaced by iron oxyhydroxides (hematite?) and clay minerals(?). Glass has devitrified to a branching brown clay mineral(?). Thin veins have large alteration halos.

VEINS/FRACTURES: Few thin veins (<<1 mm). Piece 19 has a fracture pattern resembling that which forms under thermal contraction. Carbonate fills these fractures.

Core Photo



195-1201D-54R-1 (Section top: 579.50 mbsf)

ROCK NAME: Very highly altered sparsely plagioclase phyric basalt

UNIT: 1

Pieces: 1-13

Interval: 0-118 cm

CONTACTS: None.

PHENOCRYSTS: Rare in hand specimen. Plagioclase (up to 2%) observed in thin section

GROUNDMASS: Fine-grained. Textures observed in thin section are felty, hyalopilitic, spherulitic, intersertal, and subophitic.

CAVITIES: None visually obvious.

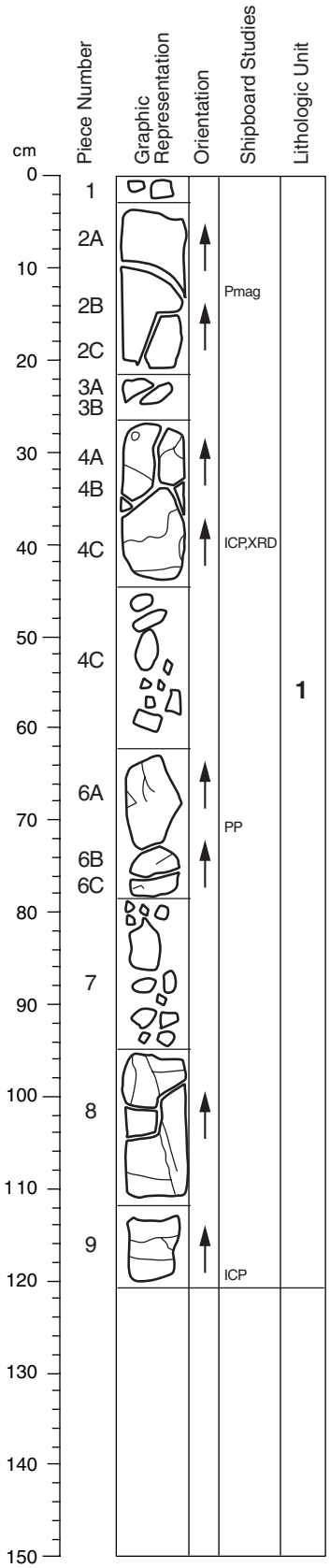
COLOR: Reddish gray (10R 5/1) but varies in places to a lighter and more bluish color. A fragment of interpillow sedimentary material in Piece 12A is light brown (7.5YR 6/4).

STRUCTURE: Pillow lava. Pillow rims are observed within Pieces 1, 2, and 11. Piece 11 exhibits a chilled margin, hyaloclastite, and interpillow sedimentary material. Piece 7 seems to consist of interpillow sedimentary material, or perhaps just very highly altered basalt(?) with small fragments of altered volcanic glass attached. One fragment in Piece 12A is interpillow sedimentary material.

ALTERATION: Extensive. Plagioclase is replaced by alkali feldspar, zeolites, carbonate and clay minerals(?). Olivine is replaced by iron oxyhydroxides (hematite?). The glass matrix is replaced by clay minerals(?).

VEINS/FRACTURES: Few thin fractures are filled with carbonate.

Core Photo



195-1201D-54R-2 (Section top: 580.68 mbsf)

ROCK NAME: Very highly altered aphyric? basalt

UNIT: 1

Pieces: 1-9

Interval: 0-121 cm

CONTACTS: None.

PHENOCRYSTS: Few altered olivine phenocrysts observed in hand specimen.

GROUNDMASS: Fine-grained aphanitic.

CAVITIES: Most vesicles are filled by secondary minerals, some of which are carbonate.

COLOR: Reddish gray (10R 5/1)

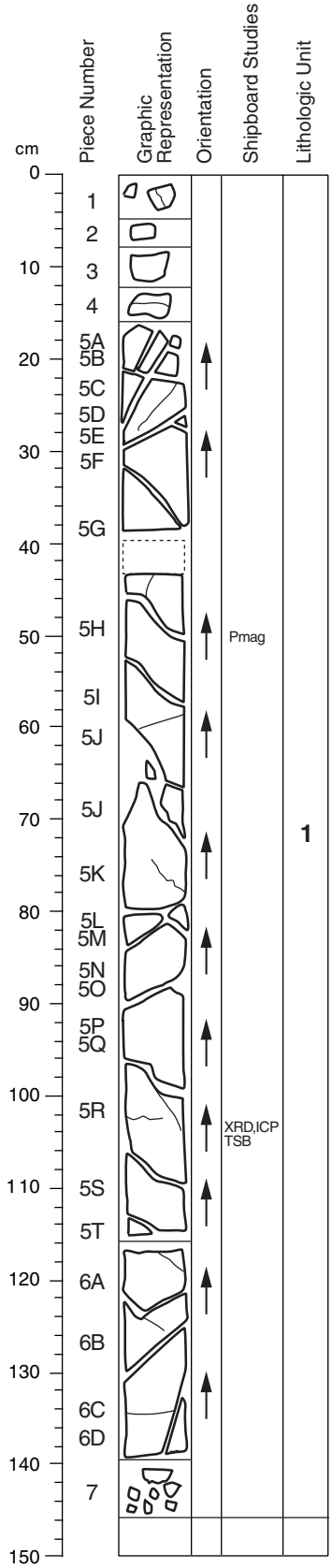
STRUCTURE: Pillow lava(?). No pillow margins observed in hand specimen.

ALTERATION: Large alteration halos are commonly observed around fractures.

VEINS/FRACTURES: Fractures are filled by carbonate material.

COMMENTS: No thin section samples were taken from this section.

Core Photo



195-1201D-55R-1 (Section top: 588.10 mbsf)

ROCK NAME: Moderately altered moderately clinopyroxene-plagioclase phyric basalt.

UNIT: 1

Pieces: 1-7

Interval: 0-146 cm

CONTACTS: None.

PHENOCRYSTS: Plagioclase (2%) and clinopyroxene (5%) are observed in thin section.

GROUNDMASS: Fine-grained. Coarser than previous cores. Subophitic texture dominates in thin section.

CAVITIES: Vesicular. Vesicles are filled by secondary white minerals (both carbonate and noncarbonate).

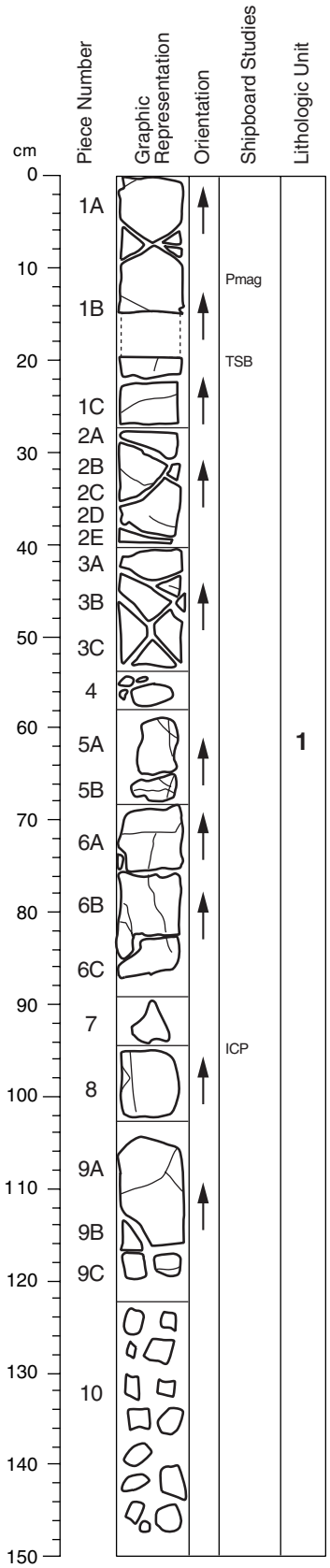
COLOR: Bluish gray (5B 5/1) in less altered parts. Some parts have a brownish tint. Pieces in Piece 7 resemble very dark grayish brown (10YR 3/2), interpillow sedimentary material.

STRUCTURE: Massive(?), perhaps lava flow. No pillow margins observed, but in Piece 7 some pieces resemble interpillow sedimentary material.

ALTERATION: Moderate. Plagioclase is mostly fresh but in some areas is replaced by carbonate, zeolites, and clay minerals(?).

VEINS/FRACTURES: Few and very thin filled by reddish material and late-stage precipitation of carbonate.

Core Photo



195-1201D-55R-2 (Section top: 589.56 mbsf)

ROCK NAME: Moderately altered aphyric basalt

UNIT: 1

Pieces: 1-10

Interval: 0-150 cm

CONTACTS: None.

PHENOCRYSTS: None observed.

GROUNDMASS: Fine-grained. Subophitic texture dominating in thin section.

CAVITIES: None visually obvious.

COLOR: Top of section is bluish gray (5B 5/1) with brownish zones. The remaining section is reddish gray (10R 5/1).

STRUCTURE: Pillow lava. Pillow rims are observed within Pieces 5, 6, and 10.

ALTERATION: Moderate. Plagioclase replaced by alkali feldspar and/or zeolites. Olivine replaced by iron oxyhydroxides (hematite?).

VEINS/FRACTURES: Fractures common throughout lower half of section. Piece 5 has a pattern of radiating fractures toward the pillow rim. Piece 6 has veins of reddish brown material and some with late stage precipitation of carbonate. Fractures in Piece 8 are unfilled.

Sample	Depth (mbsf)	Lithology	Texture (vol %)			Component												
			Sand	Silt	Clay	Clay Mineral	Detrital Zeolite	Fe Oxide	Feldspar	Heavy Minerals	Mica	Opaline Particles	Opaques	Phillipsite	Quartz	Volcanic Glass	Nannofossils	Pumice
Hole A																		
195-1201A-01-H-01, 000 cm	0.00	Red silty clay	1	19	80	D			C	R	R		R		C	R		
195-1201A-01-H-01, 009 cm	0.09	Red silty clay	1	19	80	D			C	R	R		R		C	C		
195-1201A-01-H-01, 018 cm	0.18	Red silty clay	5	30	65	D			A	R	R		R		A	R		
195-1201A-01-H-01, 032 cm	0.32	Red silty clay	1	19	80	D			C	R	R		R		C	R		
195-1201A-01-H-01, 065 cm	0.65	Concretion	25	15	60	D			C		R		P		C	A		
195-1201A-01-H-01, 082 cm	0.82	Red silty clay	1	24	75	D			C	R	R		P		C	R		
195-1201A-01-H-01, 105 cm	1.05	Red silty clay	1	19	80	D			C	R					C	R		

Sample	Depth (mbsf)	Lithology	Texture (vol %)			Component												
			Sand	Silt	Clay	Clay Mineral	Detrital Zeolite	Fe Oxide	Feldspar	Heavy Minerals	Mica	Opaline Particles	Opaques	Phillipsite	Quartz	Volcanic Glass	Nannofossils	Pumice
Hole B																		
195-1201B-01-H-01, 060 cm	0.60	Red silty clay	1	19	80	D			C				R	R	C	R		
195-1201B-01-H-01, 126 cm	1.26	Red silty clay		15	85	D			P				R		P	R		
195-1201B-01-H-05, 060 cm	6.60	Red silty clay		10	90	D			P				R	R	P	R		
195-1201B-02-H-01, 030 cm	7.50	Red silty clay		10	90	D			P	R			R	R	P	R		
195-1201B-02-H-05, 073 cm	13.93	Red silty clay		5	95	D			R					P	R			
195-1201B-02-H-07, 085 cm	17.05	Red silty clay		10	90	D			P		R		R	P	P			
195-1201B-03-H-01, 070 cm	17.40	Red silty clay		10	90	D			P	R	R		R	P	P	R		
195-1201B-03-H-01, 121 cm	17.91	Red silty clay	2	18	80	D			P	R	R		P	C	P			
195-1201B-03-H-04, 020 cm	21.40	Concretion		5	95									D				
195-1201B-03-H-06, 057 cm	24.77	White green layer			100	D												
195-1201B-04-H-03, 127 cm	30.47	Coarse calcareous silt		80	20	R			R				R		R		D	
195-1201B-04-H-03, 131 cm	30.51	Red silty clay		10	90	D			P				R	P	P			
195-1201B-04-H-06, 118 cm	34.88	Chert layer		100								A		A				
195-1201B-04-H-07, 070 cm	35.90	Dark brown clay		5	95	D		A						P				
195-1201B-05-H-04, 080 cm	41.00	Brown silty clay		40	60	A			R				R	A	R		A	
195-1201B-05-H-06, 065 cm	43.85	Brown silty clay		10	90	D			P			R	R	C	P			
195-1201B-05-H-06, 077 cm	43.97	Brown chert		60	40	C						D	R	C				
195-1201B-05-H-06, 081 cm	44.01	Light brown chert		60	40	C			R			D	R	C	R			
195-1201B-06-H-01, 060 cm	45.80	Tan silty clay		40	60	D								A			R	
195-1201B-07-X-02, 114 cm	49.34	Light silt layer		80	20	C			R					D	P			
195-1201B-07-X-02, 147 cm	49.67	Gray sandstone	80	20	0	P	A		C	P				A	R			
195-1201B-07-X-03, 098 cm	50.68	Brown siltstone	20	70	10	D	0	0		P				A				
195-1201B-07-X-03, 141 cm	51.11	Tan siltstone		20	80	C			P		R			D				
195-1201B-08-X-01, 060 cm	52.50	Brown sandstone	10	70	20	C			A	P	R	P		C				
195-1201B-08-X-02, 055 cm	53.95	Dark silty claystone	2	38	60	D			P	P				P				
195-1201B-08-X-04, 088 cm	57.28	Dark sandy siltstone	40	40	20	C			A	P	R			C	P	P		
195-1201B-08-X-04, 110 cm	57.50	Dark claystone	3	7	90	D			P					A				
195-1201B-08-X-06, 030 cm	59.20	Dark clayey siltstone	10	50	40	D			C							C		
195-1201B-08-X-06, 072 cm	59.62	Dark silty claystone	2	48	50	D			P	R				R		R		
195-1201B-08-X-06, 007 cm	58.97	Sandy laminite	90	10					R	R								D
195-1201B-09-X-CC, 032 cm	62.61	Fine light laminite	2	28	70	D			R	R	R			R		P		
195-1201B-09-X-CC, 034 cm	62.63	Dark green silty sandstone	70	30		P			P		R	P		P		D		
195-1201B-09-X-CC, 036 cm	62.65	Calcareous siltstone	5	75	20												D	

TS No.	Sample	Depth (mbsf)	Rock Type	Texture/Structure								Minerals								Rock Fragments						Diagenetic Indicators								
				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Mean (mm)	Sorting	Roundness	Bedding	Plagioclase	Pyroxene	Green Hornblende	Mica	Opaques	Nannofossils / Carbonate Micrite	Glass Shards	Pumice Shards	Porphyres/Vitrophyres	Red Scoria	Dacites	Sideromelane	Clay Clast	Shallow-water Carbonate	Clay rims	Feldspar Overgrowth	Replacement by Carbonate	Phillipsite	Devitrification by green clay	Zeolite Spherolites	Zeolite cement	Chabazite/Erionite	Gypsum
	Hole B																																	
53	195-1201B-07X-01, 046-048 cm	47.16	Fine Sandstone		65	30	5	0.1	w	a	ma	ab	co		ra	pr		do		co								x						
54	195-1201B-07X-02, 115-118 cm	49.35	Fine Sandstone		60	30	10	0.1	w-m	a	la	ab	pr			pr		do		ra	ra						x	x						
55	195-1201B-07X-04, 095-097 cm	52.15	Gravelly Sandstone	30	65	5		1	m-p	a-sr	ma	co	pr			pr				do	ab	co	pr				x	x						
58	195-1201B-08X-02, 022-024 cm	53.62	Gravelly Sandstone	35	60	5		1	p	sa-sr	ma	ab	co			pr				do	pr	co	co			x			x					
56	195-1201B-08X-06, 026-028 cm	59.16	Siltstone		5	90	5	0.04	w-m	a	la	pr	ra			ra		do																
57	195-1201B-08X-CC, 064-067 cm	59.54	Gravelly Sandstone	25	65	10		1	m	a-sr	ma	pr	ra			ra				do	co	ra	ra											

KEY:
sorting: w - well, m - medium, p - poor
roundness: a - angular, sa - subangular, sr - subrounded, r - rounded
bedding: ma - massive, la - laminated, gr - graded
minerals: do - dominant, ab - abundant, co - common, pr - present
rock fragments: ra - rare, x - present within clast
diagenetic indicators - x denotes presence

TS No.	Sample	Depth (mbsf)	Rock Type	Texture/Structure								Minerals								Rock Fragments						Diagenetic Indicators								
				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Mean (mm)	Sorting	Roundness	Bedding	Plagioclase	Pyroxene	Green Hornblende	Mica	Opaques	Nannofossils / Carbonate Micrite	Glass Shards	Pumice Shards	Porphyres/Vitrophyres	Red Scoria	Dacites	Sideromelane	Clay Clast	Shallow-water Carbonate	Clay rims	Feldspar Overgrowth	Replacement by Carbonate	Phillipsite	Devitrification by green clay	Zeolite Spherolites	Zeolite cement	Chabazite/Erionite	Gypsum
	Hole D																																	
64	195-1201D-01R-01, 049-052 cm	80.89	Silt-/Sandstone		25	70	5		w-m	a-sa	gr	co	ra			ra		do		pr	pr								x					
65	195-1201D-01R-01, 121-124 cm	81.61	Gravelly Sandstone	25	70	5		0.7	p	a-sr	ma	ab	pr			pr				do	pr	pr	co					x						
68	195-1201D-01R-02, 097-100 cm	82.87	Clasts in Breccia																		x		x											
66	195-1201D-01R-04, 085-088 cm	85.55	Siltstone		10	70	20	0.04	w	an	la	pr	ra			ra		do																
67	195-1201D-01R-04, 100-103 cm	85.7	Siltstone		2	83	15	0.02	w	an	la	pr	ra			ra		do	co															
63	195-1201D-01R-CC, 014-017 cm	86.82	Coarse Sandstone	5	90	5		0.7	w-m	a-sr	ma	ab	co			co				do	pr	co	co			x	x							
69	195-1201D-02R-01, 139-140 cm	91.38	Coarse Sandstone	5	90	5		0.7	m-p	a-sr	ma	co	pr			pr				ab	pr		co		pr	x								
70	195-1201D-02R-02, 074-077 cm	92.24	Clasts in Breccia																	x	x		x											
71	195-1201D-03R-03, 058-061 cm	102.74	Clasts in Breccia																	x	x	x	x											
72	195-1201D-03R-07, 117-120 cm	107.96	Clasts in Breccia																				x								x			
73	195-1201D-04R-06, 090-094 cm	116.78	Clasts in Breccia																	x														
74	195-1201D-04R-06, 112-115 cm	117	Medium Sandstone	2	83	15		0.7	w-m	a-sa	ma	co	pr			pr				pr			do					x			x			
75	195-1201D-05R-05, 089-093 cm	125.2	Siltstone		20	70	10	0.05	w	a	ma	pr	ra			ra		do																
76	195-1201D-05R-07, 086-090 cm	127.75	Fine Sandstone		70	25	5	0.08	w	a	ma	co	ra			ra		do																
77	195-1201D-07R-06, 041-043 cm	144.85	Medium Sandstone		80	20	5	0.3	w-m	a	la	co	pr			pr				co	ra		pr			x					x			
78	195-1201D-08R-06, 120-122 cm	155.78	Coarse Sandstone	5	85	10		0.5	m	a-sa	gr	ab	co			pr				co	co		ab			x								
80	195-1201D-12R-04, 077-079 cm	190.62	Gravelly Sandstone	40	55	2		0.7	p	a-sr	ma	co	pr			pr				co			do			x	x			x		x		
81	195-1201D-12R-05, 060-062 cm	191.88	Clasts in Breccia																	x	x													
82	195-1201D-14R-01, 009-011 cm	205.39	Gravelly Sandstone	25	80	5		0.6	p	a-sr	ma	co	pr			pr				ab	co	pr	ab			x	x	x		x	x			
83	195-1201D-14R-02, 014-016 cm	206.74	Clasts in Breccia																	x														
84	195-1201D-17R-03, 106-108 cm	237.77	Siltstone	5	10	80	5	0.05	m	a	ma	co	pr			pr														x				
85	195-1201D-17R-03, 114-116 cm	237.85	Silt-/Sandstone		40	50	10	0.1	m	a	la	ab	pr			pr		do		pr			pr				x			x		x		
86	195-1201D-17R-05, 084-086 cm	240.38	Gravelly Sandstone	25	70	5		1.5	p	sa-sr	ma	pr	ra			ra				co			do								x	x		
87	195-1201D-18R-03, 015-018 cm	246.96	Clasts in Breccia																				x											
88	195-1201D-18R-03, 020-022 cm	247.01	Clasts in Breccia																	x	x		x											
90	195-1201D-20R-01, 100-102 cm	264	Clasts in Breccia																	x														
89	195-1201D-20R-03, 013-015 cm	265.79	Gravelly Sandstone	20	75	5		0.5	p	a-sr	ma	pr	ra	ra		pr				co	pr		do		ra	x						x		
91	195-1201D-20R-04, 140-142 cm	268.56	Gravelly Sandstone	10	85	5		0.5	p	a-sr	ma	co	ra	ra		ra				ab	co		ab		ra	x						x		
92	195-1201D-21R-04, 097-099 cm	277.41	Coarse Sandstone		90	10		0.4	m	a	ma	ab	co			pr	co			ab	pr		co			x						x		
94	195-1201D-24R-04, 077-079 cm	306.28	Clasts in Breccia																				x											
95	195-1201D-26R-01, 033-035 cm	321.03	Fine Sandstone		80	20		0.1	w-m	a	ma	co	ra			ra				pr	ra		do									x		
96	195-1201D-26R0-6, 134-136 cm	328.97	Gravelly Sandstone	40	50	10			p	a-sr	ma	co	pr			pr				co			do	ab						x	x	x		
97	195-1201D-29R0-2, 027-030 cm	350.86	Clasts in Breccia																													x		
98	195-1201D-30R0-6, 114-116 cm	367.74	Coarse Sandstone		90	10		0.6	w-m	a-sr	ma	co	pr			pr				co	pr		do			x						x		
99	195-1201D-31R-04, 100-102 cm	374.1	Siltstone		25	65	10	0.02	w	a	la	co	ra			co	co	do												x		x		
100	195-1201D-31R-05, 094-097 cm	375.55	Siltstone		10	70	20	0.02	w-m	a	la	pr	ra			pr	pr	do												x		x		
101	195-1201D-35R-07, 056-059 cm	414.81	Fine Sandstone		80	20		0.1	w	a	la	co	pr			pr		ab		pr			do									x		
102	195-1201D-36R-02, 015-018 cm	418.13	Altered Siltstone		20	80	30	0.02	m	a	ma	pr	ra			ra	pr	do												x		x	x	x
103	195-1201D-38R-01, 029-032 cm	436.29	Altered Sandstone		80	20		0.02	w-m	a	ma	co	ra			ra		do		pr			pr			x				x		x	x	x
104	195-1201D-42R-05, 015-018 cm	480.65	Altered Sandstone		70	30	10	0.08	w	a	ma	pr	ra			ra		do					pr							x				
109	195-1201D-45R-03, 005-008 cm	506.35	Fine Sandstone		70	20	10	0.1	w	q	ma	pr	ra			ra		do					pr							x		x		

Key:
(See Hole B sedimentary thin sections.)

TS: 108 195-1201D-46R-1, 35-38 cm (Piece 3) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Very highly altered aphyric basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Vesicular, spherulitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase								
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase	2	15			0.3		Skeletal-subhedral	Plagioclase spherulites are common. Replaced by alkali feldspar and zeolites.
Clinopyroxene	15	15			0.1	Mg-rich	Subhedral	Commonly shows undulatory extinction.
Orthopyroxene								
Olivine		5		0.5	0.2		Euhedral	Replaced by iron oxyhydroxides, zeolites, carbonate, and opaque minerals.
Opaques								
Glass		58						Devitrified to clay minerals(?) and zeolites(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.		REPLACING	COMMENTS
Clay minerals	70?					Glass	
Chlorite							
Zeolites	5?				Thomsonite(?)	Plagioclase, olivine	
Carbonates	1					Plagioclase, olivine	
Amphiboles							
Epidote							
Other							

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
	Center		4		Opaques, calcite, zeolites	With altered glass shards and iron oxyhydroxide alteration halo.

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles	5	7					
Amygdules	2					Zeolites (Thomsonite?), clay minerals	

COMMENTS: The vein contains 4-mm-wide glass shards altered to clay minerals(?) and/or zeolites(?), in addition to bioclasts in the sedimentary intervals. The alteration halo along the vein consists of iron oxyhydroxides and is approximately 4 mm wide to both sides. Spherulitic arrangement of vesicles is seen in the halo. The outer part of the halo has a large concentration of vesicles filled by a green clay mineral. Identification of alteration products of glass is only tentative.

TS: 110 195-1201D-45R-5, 103-107 cm (Piece 1) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Very highly altered sparsely phyric basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Intersertal, spherulitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase		2			1		Euhedral	Completely replaced by zeolites (also needle-like) and alkali feldspar.
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase		18			0.3		Skeletal	Replaced by zeolites, alkali feldspar, and/or carbonate.
Clinopyroxene	13	12		0.4	0.1		Subhedral	Forms spherulites with plagioclase.
Orthopyroxene								
Olivine		3		0.4	0.2		Euhedral	Replaced by iron hydroxides and zeolites.
Opaques	<1	<1		0.15			Euhedral	Magnetite and chromite(?).
Glass		60						Devitrified to clay minerals, zeolites(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	37?				Glass	
Chlorite						
Zeolites	15				Plagioclase, olivine	
Carbonates	15			0.6	In vein, plagioclase	
Amphiboles						
Epidote						
Other	15					Sedimentary material in vein and alkali feldspar.

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
	Crosscuts thin section		1.2		Reddish brown fine-grained sedimentary material	Thin alteration halo.
	Upper corner		2		Carbonate, zeolites, reddish brown fine-grained sediments	Carbonate formed from recrystallization or second episode of precipitation in vein.

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles	1	5					
Amygdules	4					Clay minerals, zeolites	

COMMENTS: This slide has abundant needle-shaped, dark brown to black crystals, often arranged in radial groups. It is associated with the veins, with zeolites replacing plagioclase and is also found in amygdules. The vein with reddish brown fine-grained material contains bioclasts. Identification of alteration products of glass is only tentative.

TS: 111 195-1201D-46R-5, 8-11 cm (Piece 1) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Highly altered moderately plagioclase-clinopyroxene phyric basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Intergranular, intersertal, spherulitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase		2		1			Euhedral	Completely replaced by zeolites, alkali feldspar(?), carbonate, and also iron oxyhydroxide in the halos of the vein.
Clinopyroxene	<1	<1		0.8			Anhedral, subhedral	Undulatory extinction.
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase		30			0.3		Euhedral, skeletal	Replaced by zeolites, alkali feldspar(?), and carbonate.
Clinopyroxene	30	30			0.1		Subhedral, euhedral	Undulatory extinction, few with twinning.
Orthopyroxene								
Olivine		5		0.5	0.1		Euhedral	Replaced by iron oxyhydroxides and zeolites.
Opaques	6	1		0.3			Elongated, skeletal	Scattered in areas of clay minerals. Secondary opaque minerals are after olivine.
Glass		21						Devitrified to clay minerals.

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	22				Glass	
Chlorite						
Zeolites	32				Plagioclase, olivine	
Carbonates	<1				Plagioclase	
Amphiboles						
Epidote						
Other	<1?				Plagioclase	Alkali feldspar(?)

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
	Crosscuts T.S.			6	Sedimentary material, glass fragments, carbonate	

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles	7	10					Green clay minerals rim some vesicles.
Amygdales	3					Zeolites, green clay mineral	

COMMENTS: Identification of alteration products of glass is only tentative. Clinopyroxene and plagioclase often form spherulites. The vein consists of sedimentary material and glass fragments devitrified to zeolites along the rim. The interior is preserved glass. There is an inner rim of 0.1-mm-thick carbonate along the lower side of the vein, with an outer iron oxyhydroxide rim 0.1 mm thick. On the opposite side there is a rim 0.3 mm thick also of iron oxyhydroxide. Halos occur on both sides and are approximately 4 mm wide. Within the halos there are abundant vesicles with green clay minerals, and more iron oxyhydroxide in the groundmass.

TS: 112 195-1201D-46R-3, 5-7 cm (Piece 2) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Very highly altered basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Aphiric, subophitic, spherulitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase								
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase		2			<0.1		Euhedral	Replaced by zeolites.
Clinopyroxene	2	2			0.3	Mg-rich	Euhedral to subhedral	Sometimes shows ondulatory extinction.
Orthopyroxene								
Olivine		2			0.2		Euhedral	Replaced by iron oxyhydroxides or calcite.
Opaques	1	1			<0.05			
Glass		82						Devitrified to clay minerals(?) and zeolites(?)

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	82					
Chlorite						
Zeolites	4					
Carbonates	<<1	<1				
Amphiboles						
Epidote						
Other						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles	10	11			1		
Amygdules	1					Zeolites, iron oxyhydroxides	

COMMENTS: Clinopyroxene and plagioclase crystals often form clusters. The identification of alteration products of glass is only tentative.

TS: 113 195-1201D-46R-1, 137-139 cm (Piece 10) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Completely altered aphyric basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Spherulitic, subophitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase								
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase		2		1.2	0.4		Euhedral, skeletal	Replaced by zeolites, carbonate, and alkali feldspar(?).
Clinopyroxene	1	1			0.3	Mg-rich	Subhedral, euhedral	Commonly shows undulatory extinction.
Orthopyroxene								
Olivine		1					Euhedral, subhedral	Replaced by carbonate, zeolites, and iron hydroxides.
Opaques	1	1					Subhedral, skeletal	
Glass		85						Devitrified to zeolites and clay minerals(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.		REPLACING	COMMENTS
Clay minerals	83?					Glass	
Chlorite							
Zeolites	5?				Analcite(?)	Plagioclase, olivine, glass(?)	
Carbonates	<<1					Plagioclase, olivine	
Amphiboles							
Epidote							
Other							

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles	8	10		4	0.8		
Amygdules	2					Clay minerals	

COMMENTS: Clinopyroxene and plagioclase have a tendency to cluster and form subophitic, radiating textures. Lighter colored patch in this slide is more altered (?). The rock was originally hypocrystalline. Identification of alteration products of glass is only tentative.

TS: 114 195-1201D-46R-2, 71-74 cm (Piece 4B) **Unit 1** **OBSERVER: MD, IS, MK**

ROCK NAME: **Completely altered sparsely plagioclase phyric basalt**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Spherulitic, intersertal, and subophitic in some places.**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase		2		1.5	0.5		Euhedral	Sometimes partially replaced by carbonate, or completely by zeolites.
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase		1			0.1		Skeletal	Replaced by alkali feldspar(?), zeolites(?), and clay minerals in center but sodium-rich rims are preserved.
Clinopyroxene	2	2		0.5	0.2	Mg-rich	Subhedral, anhedral	Some how undulatory extinction.
Orthopyroxene								
Olivine		<1					Euhedral	Replaced by zeolites, iron oxyhydroxide, and clay minerals.
Opaques	<1	<1						
Glass		91						

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	90?				Glass	
Chlorite						
Zeolites	5?				Plagioclase, olivine, glass	Analcite(?), Thomsonite(?)
Carbonates	<1				Plagioclase	
Amphiboles						
Epidote						
Other						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles	2	3					
Amygdules	1					Zeolites	

COMMENTS: The sample was taken along a pillow margin. The margin has dark brown spherulites with inclusions of needle-like plagioclase. Clinopyroxene, olivine and plagioclase crystals often form clusters. The identification of alteration products of glass is only tentative.

TS: 115 195-1201D-46R-3, 99-101 cm (Piece 10) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Completely altered aphyric basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Holohyaline, spherulitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase		<1		1			Skeletal, elongated	Replaced by alkali feldspar and zeolites.
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase		2			0.1		Skeletal	Replaced by alkali feldspar and zeolites.
Clinopyroxene	1	1			0.05	Mg-rich	Subhedral or skeletal	Shows undulatory extinction.
Orthopyroxene								
Olivine		<1			0.15		Euhedral	Replaced by iron oxyhydroxides and zeolites.
Opaques	<1	<1		0.01			Larger grains euhedral	Outlining the spherulites.
Glass		90						Devitrified to clay minerals(?) and zeolites(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	88?				Glass	
Chlorite						
Zeolites	3				Plagioclase, olivine, glass	
Carbonates						
Amphiboles						
Epidote						
Other	2				Plagioclase	Alkali feldspar

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles	5	6					Brownish clay minerals(?) rim the vesicles.
Amygdules	1					Zeolites	

COMMENTS: This sample was probably taken along a pillow margin. Marginal area of the slide exhibits glass fragments, spherulites, and a halo penetrating the basalt. Plagioclase, and sometimes clinopyroxenes, show skeletal habits. There is a lighter-colored patch in the center, in which the glass shows a higher degree of alteration and devitrification. Identification of alteration products of glass is only tentative.

TS: 116 195-1201D-46R-3, 140-142 cm (Piece 15) **Unit 1** **OBSERVER: MD, IS, MK**

ROCK NAME: **Very highly aphyric altered basalt**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Hyalopilitic, spherulitic, in more crystalline areas also subophitic and intersertal**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase		<1		1.2			Euhedral	Replaced by zeolites.
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase		15			0.5		Skeletal	Replaced by zeolites and carbonate.
Clinopyroxene	10	10			0.1	Mg-rich	Subhedral	
Orthopyroxene								
Olivine		<1		0.5	0.3		Euhedral	Replaced by clay minerals.
Opaques	<1	<1		0.02			Subhedral, skeletal	Outlining spherulites.
Glass		65						Devitrified to clay minerals(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	60?				Glass, olivine	
Chlorite						
Zeolites	20				Plagioclase, glass	
Carbonates	<1				Plagioclase	
Amphiboles						
Epidote						
Other						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles	1	10					
Amygdules	9					Zeolites, clay minerals	

COMMENTS: Clinopyroxene and plagioclase crystals form spherulitic clusters. In distinct areas vesicles are very abundant and have a tendency to form radiating arrangements. Identification of alteration products of glass is only tentative.

TS: 117 195-1201D-46R-4, 24-27 (Piece 6a) **Unit 1** **OBSERVER: MD, IS, MK**

ROCK NAME: **Very highly altered aphyric basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Intersertal, vesicular, spherulitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase		<1		1			Euhedral	Replaced by zeolites and carbonate.
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase		20			0.3		Skeletal	Replaced by zeolites and alkali feldspar(?). Forms spherulites.
Clinopyroxene	15	15			0.2	Mg-rich	Anhedral	Forms spherulites; commonly shows undulatory extinction.
Orthopyroxene								
Olivine		1		0.5	0.1		Euhedral	Replaced by clay minerals, zeolites and iron oxyhydroxide.
Opaques	<<1	<<1		0.02			Euhedral, elongated	Outline patches of clay minerals, otherwise randomly distributed.
Glass		55						Devitrified to clay minerals(?), and zeolites(?)

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	50?				Glass, olivine	
Chlorite						
Zeolites	20				Plagioclase, olivine, glass(?)	Different varieties present.
Carbonates	5				Plagioclase	Near margin.
Amphiboles						
Epidote						
Other						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles		10					
Amygdules	10					Clay minerals, zeolites	

COMMENTS: Clinopyroxene and plagioclase form clusters with a subophitic texture in some places. The slide contains a transition halo towards the margin, with abundant clay minerals, then iron oxyhydroxides. At the margin there is hyaloclastitic material, made up of several fragments of devitrified glass in a matrix of zeolites(?) and carbonate. Identification of alteration products of glass is only tentative.

TS: 118 195-1201D-46R-4, 24-27 cm (Piece 6b) **Unit 1** **OBSERVER: MD, IS, MK**

ROCK NAME: **Hyaloclastite**
GRAIN SIZE: **Coarse-grained**
TEXTURE: **Holohyaline, brecciated, spherulitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase								
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase		<1					Euhedral	Replaced by zeolites.
Clinopyroxene	<1	<1					Subhedral	Undulatory extinction.
Orthopyroxene								
Olivine		1					Euhedral	Replaced by iron oxyhydroxide.
Opaques	3	3						
Glass	52	95						Devitrified(?)

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	1?				Glass	
Chlorite						
Zeolites	2?				Glass	Spherulitic zeolites grow inside fragments along zone boundaries.
Carbonates	<1					
Amphiboles						
Epidote						
Other	40					Sedimentary material.

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles		2					
Amygdules	2					Clay minerals, zeolites	

COMMENTS: Larger zoned dusty green to brown fragments of slightly devitrified(?) glass in a matrix of sedimentary material and small colorless fragments of isotropic material(?). Spherulites of dark brown fibres are included in larger glassy fragments along with clusters of pseudomorphs after plagioclase and olivine. Clinopyroxene is preserved in the spherulites. Sedimentary material between fragments contain biogenic material (radiolarians).

TS: 119 195-1201D-46R-4, 30-33 cm (Piece 7) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Hyaloclastite**
GRAIN SIZE: **Coarse-grained**
TEXTURE: **Brecciated, hypocrystalline**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase								
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase		<1					Euhedral	Replaced by carbonate.
Clinopyroxene	<1	<1			0.1		Euhedral to anhedral	
Orthopyroxene								
Olivine		<1					Euhedral	Replaced by iron oxyhydroxides.
Opaques	3						Dust-like	Secondary magnetite.
Glass	65	84						Devitrified to zeolites(?) and clay minerals(?)

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	8?				Glass	
Chlorite						
Zeolites	?				Glass	
Carbonates	10				Plagioclase, in veins	Patches in the sedimentary material.
Amphiboles						
Epidote						
Other	13	15				Sedimentary material.

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
				0.2	Carbonate	Few, crosscutting.

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles							
Amygdules							

COMMENTS: The rock is a hyaloclastite, made up of many fragments of basaltic glass, with few scattered microliths of clinopyroxene, and altered plagioclase and olivine. The glass fragments, averaging 4 mm in size, are embedded in interpillow material constituted by smaller glass fragments and sedimentary material containing radiolarians.

TS: 120 195-1201D-46R-5, 58-60 cm (Piece 4B) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Very highly altered sparsely plagioclase phyric basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Spherulitic, intersertal**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase		1		1.5			Euhedral	Replaced by carbonate and zeolite.
Clinopyroxene	<<1	<<1		0.6		Mg-rich	Subhedral	
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase		20			0.15		Skeletal	Replaced by zeolites, carbonate, and alkali feldspar(?). Sodium-rich rims are preserved.
Clinopyroxene	15	15		0.5	0.06		Subhedral	Undulatory extinction.
Orthopyroxene								
Olivine		1		0.5	0.3		Subhedral	Replaced by clay minerals(?) and iron oxyhydroxide.
Opaques	<1	<1		0.03			Euhedral to dendritic	Random distribution.
Glass		58						Devitrified to clay minerals(?) and zeolites(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	56?				Glass, olivine	
Chlorite						
Zeolites	23?				Plagioclase, glass	
Carbonates	<1				Plagioclase	
Amphiboles						
Epidote						
Other						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Fracture	Lower left corner				Void	

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles	2	5					Clay minerals line the vesicles.
Amygdules	3					Zeolites, clay minerals	

COMMENTS : There are some glomerocrysts of clinopyroxene and altered plagioclase. There are zones of less crystalline and more vesicular material with small vesicles forming a radiating pattern. Carbonate and clay minerals are around the fracture, indicating a change in the alteration pattern. Identification of alteration products of glass is only tentative.

TS: 121 195-1201D-47R-1, 24-27 cm (Piece 4) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Hyaloclastite**
GRAIN SIZE: **Coarse-grained**
TEXTURE: **Brecciated, hypocrystalline, spherulitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase								
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase		<<1					Euhedral	
Clinopyroxene	<<1	<<1				Mg-rich	Subhedral	
Orthopyroxene								
Olivine		<1			0.4		Euhedral	Replaced by iron oxyhydroxides and clay minerals.
Opaques	10						Dust-like	Secondary, often in large patches.
Glass	5	49						Devitrified to zeolites(?), clay minerals(?) and opaques.

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	27				Glass	
Chlorite						
Zeolites	5				Glass	
Carbonates	2					Precipitated in sedimentary material and inside glass fragments.
Amphiboles						
Epidote						
Other	35	35				Interpillow sedimentary material.

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles	10	15					Inside fragments and in sediment.
Amygdules	5					Zeolites, carbonate, clay minerals, iron oxyhydroxide	

COMMENTS: The rock is a hyaloclastite, made up of many fragments of basaltic glass, with few scattered microliths of clinopyroxene, and altered plagioclase and olivine. The glass fragments, averaging 4 mm in size, are embedded in interpillow material constituted by smaller glass fragments and sedimentary material containing radiolarians. Some vesicles inside the glass fragments have dark brown clay mineral spherulites with inclusions of clinopyroxene and plagioclase. Identification of alteration products of glass is only tentative.

TS: 122 195-1201D-47R-1, 117-119 cm (Piece 15) **Unit 1** **OBSERVER: MD, IS, MK**

ROCK NAME: **Hyaloclastite and interpillow sediment**
GRAIN SIZE: **Coarse-grained**
TEXTURE: **Brecciated**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase								
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase								
Clinopyroxene	<<1	<<1						Extremely fine-grained.
Orthopyroxene								
Olivine		1			0.3		Euhedral	Replaced by iron oxyhydroxide and zeolites(?).
Opaques								
Glass	20	32						Some devitrified to clay minerals(?) and zeolites(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	7				Glass	
Chlorite						
Zeolites	5				Glass	Spherulitic zeolites form along glass fragment boundaries.
Carbonates	<<1					
Amphiboles						
Epidote						
Other	65	65				Sedimentary material.

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
					Zeolites and very little carbonate.	

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles		2					
Amygdules	2					Clay minerals(?)	Spherulites of a dark brown fiber associated with glass fragments.

COMMENTS: This sample contains fragments of brecciated pillow margin glass in a light brown to red sedimentary matrix. Dark red colored sediment have increased amounts of iron oxyhydroxide. The glass fragments and the matrix are associated with an abundant mineral phase which 'suggested by XRD-results' may be K-feldspar, which is in agreement with optical observations. Glass is replaced by a colloform clay mineral(?) phase in some fragments.

TS: 123 195-1201D-47R-2, 85-87cm (Piece 10) **Unit 1** **OBSERVER: MD, IS, MK**

ROCK NAME: **Very highly altered sparsely plagioclase phyric basalt**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Hypocrystalline, amygduloidal**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase		1.5		0.8	0.5		Euhedral, platy	Replaced by carbonate, alkali-feldspar, zeolites.
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase		1			0.3		Skeletal	Replaced by carbonate, alkali-feldspar, zeolites.
Clinopyroxene	7	7		0.3	0.05		Subhedral	Shows undulatory extinction.
Orthopyroxene								
Olivine		1.5		0.5	0.2		Euhedral	Replaced by iron oxyhydroxides, zeolites and clay minerals(?).
Opaques	5						Dendritic	Outlining clay minerals.
Glass		64						Devitrified to clay minerals(?) and opaque minerals(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	40?				Glass, olivine	
Chlorite						
Zeolites	3				Olivine, plagioclase, glass	Analcite(?)
Carbonates	20				In vein; plagioclase	
Amphiboles						
Epidote						
Other						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
	Above center			6	Sediment and carbonate	Distinct halos around vein.

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles	2	25					
Amygdales	23					Clay minerals(?)	

COMMENTS: Identification of alteration products of glass is only tentative. The vein consists of rounded carbonate grains with included minute sedimentary grains(?). In the central part of the vein, the carbonate grains are larger and free of inclusions. The vein has three distinct halos. The outer halo gives the basaltic groundmass a brownish tint. The inner halo around the vein, consisting of a fibrous low birefringence mineral, is much narrower and free of primary minerals, and the halo adjacent to the vein consist of transparent dark red material, perhaps iron oxide.

TS: 124 195-1201D-47R-2, 109-111 cm (Piece 12) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Highly altered sparsely plagioclase phyric basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Hyalopilitic, intersertal, amygduloidal**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase		2		1.2			Euhedral	Replaced by carbonate, alkali feldspar(?), and clay minerals(?).
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase		10			0.2		Skeletal, swallow-tailed	Replaced by zeolites(?), alkali feldspar(?), and clay minerals.
Clinopyroxene	10	10	0.05	0.4			Subhedral	Aligned in groundmass along with plagioclase needles.
Orthopyroxene								
Olivine		2			0.3		Euhedral	Replaced by clay minerals(?), zeolites, rarely iron oxyhydroxides.
Opaques	5	5			0.02		Small euhedral grains, sometimes dendritic	Outline vesicles.
Glass		51						Replaced by clay minerals(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	55?				Glass, olivine, plagioclase	
Chlorite						
Zeolites	10				Plagioclase, olivine	
Carbonates						
Amphiboles						
Epidote						
Other						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles		20					
Amygdules	20(?)			8	0.1	Zeolites, clay minerals	

COMMENTS: Generally large amygdules (up to 8 mm) are occupied by zeolites and smaller (up to 0.2 mm) are occupied by clay minerals(?). Large grains of clinopyroxene and plagioclase phenocrysts have a tendency to cluster and form subophitic textures. Identification of alteration products of glass is only tentative.

TS: 125 195-1201D-47R-2, 124-127 cm (Piece 16) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Very altered moderately plagioclase-olivine phyric basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Porphyritic, glomeroporphyritic, hyalopilitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase		2		1.2	0.5			Replaced by zeolites, carbonates and alkali feldspar(?).
Clinopyroxene								
Olivine		<1		0.8	0.5			Replaced by clay minerals(?), and iron oxyhydroxide(?).
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase		5			0.25		Euhedral elongated	Replaced by alkali feldspar(?).
Clinopyroxene	15	15			0.08		Euhedral to subhedral	Sometimes shows undulatory extinction.
Orthopyroxene								
Olivine		<1			0.1		Euhedral	Replaced by clay minerals(?), and iron oxyhydroxide(?).
Opaques	5	5					Euhedral, elongated, to skeletal	Outline clay minerals.
Glass		68						Replaced by clay minerals(?) and opaque minerals(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	60				Glass, olivine	
Chlorite						
Zeolites	15				Plagioclase, glass(?)	
Carbonates	<1				Plagioclase	
Amphiboles						
Epidote						
Other	15					

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles	3	5					
Amygdules	2					Zeolites, clay minerals	

COMMENTS: This thin section includes margin or vein with carbonate and small grains of sedimentary material. The vein is rimmed by opaque minerals and green clay minerals(?). Identification of alteration products after glass is only tentative.

TS: 126 195-1201D-47R-3, 83-86 cm (Piece 7) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Completely altered sparsely plagioclase phyric basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Intersertal, felty**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase		1		1.6	0.7		Euhedral	Phenocrysts have tendency to cluster. Replaced by clay minerals and zeolites.
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase	<1	10		0.2	0.15	An60	Skeletal, euhedral	Replaced by clay minerals and alkali feldspar; sometimes fresh.
Clinopyroxene	1	1			0.03		Anhedral	Partially hidden by altered glass.
Orthopyroxene								
Olivine		3		0.5	0.2		Euhedral	Replaced by green clay minerals, and sometimes also opaque minerals.
Opaques	3	3					Skeletal	Few euhedral Cr-spinel(?).
Glass		82						Replaced by clay minerals(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	90?				Glass, plagioclase, olivine	
Chlorite						
Zeolites	1				Plagioclase	
Carbonates						
Amphiboles						
Epidote						
Other	5				Plagioclase	Alkali feldspar

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles		<1					
Amygdules	<1					Zeolites, clay minerals(?)	

COMMENTS: In the groundmass, vesicles are occupied by clay minerals forming spherulites. The reddish brown clay minerals(?) in the groundmass form branching textures. Plagioclase laths exhibit preserved Na-rich rims. The identification of alteration products of glass is only tentative.

TS: 127 195-1201D-47R-3, 93-96 cm (Piece 9) **Unit 1** **OBSERVER: MD, IS, MK**

ROCK NAME: **Completely altered sparsely plagioclase-olivine phyric basalt**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Felty, intersertal, subophitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase		3		1.8	0.5		Euhedral	Replaced by clay minerals(?), alkali feldspar(?), and zeolites(?).
Clinopyroxene								
Olivine		<1		0.6	0.5		Euhedral	Replaced by zeolites and clay minerals(?).
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase		7			0.3		Often skeletal, euhedral	Replaced by clay minerals(?), alkali feldspar(?), and zeolites(?).
Clinopyroxene	<<1	<<1			0.05		Subhedral	Undulatory extinction.
Orthopyroxene								
Olivine		3			0.1		Euhedral, skeletal	Replaced by clay minerals(?), and iron oxyhydroxide.
Opaques	2	2			0.01		Subhedral to skeletal.	Replacing glass(?). Concentrated around spherulites.
Glass		85						Replaced by clay minerals(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	90?				Glass, plagioclase, olivine	
Chlorite						
Zeolites	3				Plagioclase, olivine	
Carbonates						
Amphiboles						
Epidote						
Other	5				Plagioclase	Alkali feldspar.

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
	Upper half			1.5	Sedimentary material.	Two halos.

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles		<1					
Amygdules	<1					Clay minerals(?)	Spherulites.

COMMENTS: Glomerocrysts of altered olivine and plagioclase are common. Sodium-rich rims are often preserved on plagioclase laths. The brown clay mineral(?) in the groundmass has a branching texture. Spherulites of a green clay mineral(?) are scattered throughout the thin section. The vein exhibits two subsequent halos. The innermost halo gives a reddish tint to the groundmass and in some places the plagioclase needles are small, otherwise the mineralogy is unchanged. The outermost halo gives a light brown tint to the groundmass and the mineralogy is unchanged. The identification of alteration products of glass is only tentative.

TS: 128 195-1201D-47R-3, 121-123 cm (Piece 13) **Unit 1** **OBSERVER: MD, IS, MK**

ROCK NAME: **Very highly altered aphyric basalt**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Intersertal, intergranular, subophitic, spherulitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase		<<1		0.8			Euhedral	Replaced by zeolites and clay minerals(?).
Clinopyroxene								
Olivine		<<1		1.2			Euhedral	Replaced by iron oxyhydroxide and clay minerals(?).
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase	3	7			0.1	An75	Skeletal, elongated, euhedral	Sometimes preserved. Replaced by clay minerals(?).
Clinopyroxene	3	3			0.03	Mg-rich	Anhedral	
Orthopyroxene								
Olivine		1			0.2		Euhedral	Replaced by carbonate, clay minerals(?).
Opaques	2	2					Skeletal, euhedral	Outlining spherulites.
Glass		86						Replaced by clay minerals(?) and carbonate.

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	87?				Glass, olivine, plagioclase	
Chlorite						
Zeolites	2				Plagioclase	
Carbonates	2				Olivine, glass	
Amphiboles						
Epidote						
Other						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles		1					
Amygdules	1					Carbonate and hematite	Clay mineral spherulites associated with hematite along the rim and carbonate precipitate in the center.

COMMENTS: Plagioclase and olivine have a tendency to form glomerocrysts. Plagioclase is sometimes partially enclosed by olivine. The identification of alteration products of glass is only tentative.

TS: 129 195-1201D-48R-1, 47-50 (Piece 2c) **Unit 1** **OBSERVER: MD, IS, MK**

ROCK NAME: **Highly altered sparsely plagioclase phyric basalt**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Felty, branching**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase	<1	1		1	0.7		Elongated, euhedral	Quite fresh. Some have been replaced by alkali feldspar(?) and zeolites(?).
Clinopyroxene								
Olivine		<<1		1			Euhedral	Replaced by carbonate and clay minerals(?).
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase	10	20			0.2	An70	Branching	More Na-rich rims preserved. Replaced by clay minerals(?) and zeolites.
Clinopyroxene	10	10			0.1	Mg-rich	Branching	
Orthopyroxene								
Olivine		5			0.1		Euhedral	Replaced by carbonate, clay minerals(?) and iron oxyhydroxides.
Opaques	3	3		0.02	0.01		Euhedral to anhedral	
Glass		60						Glass replaced by clay minerals(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	70?				Glass, olivine, plagioclase	
Chlorite						
Zeolites	5?				Plagioclase (?)	
Carbonates	1				Olivine	
Amphiboles						
Epidote						
Other						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles							
Amygdules							

COMMENTS: The branching texture of the glass may suggest an originally perlitic texture. The branching clinopyroxene and sometimes plagioclase crystals suggest rapid cooling. The identification of alteration products of glass is only tentative.

TS: 130 195-1201D-48R-2, 74-76 cm (Piece 1D) **Unit 1** **OBSERVER: MD, IS, MK**

ROCK NAME: **Highly altered sparsely plagioclase phyric basalt**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Intersertal, intergranular, subophitic, spherulitic, branching**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase	1.5	2		1.2	0.8	An66	Euhedral	Replaced by clay minerals(?).
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase	10	20			0.3	An64	Euhedral, skeletal, branching	Replaced by clay minerals(?).
Clinopyroxene	25	25		0.15	0.1	Mg-rich	Subhedral, branching	
Orthopyroxene								
Olivine		5			0.5		Euhedral	Replaced by brownish material (clay minerals?).
Opaques	3	3			0.01		Euhedral, skeletal	
Glass		45						Replaced by clay minerals(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	REPLACING	COMMENTS
Clay minerals	61				Plagioclase, olivine, glass	
Chlorite						
Zeolites						
Carbonates						
Amphiboles						
Epidote						
Other						

VEINS	LOCATION	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	SIZE (mm) max.	SIZE (mm) av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles							
Amygdules							

COMMENTS: Identification of alteration products of glass is only tentative.

TS: 131 195-1201D-48R-2, 135-138 cm (Piece 5c) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Very highly altered sparsely plagioclase phyric basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Intersertal, felty, branching**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase	<1	1			1	An64	Euhedral, skeletal (swallow-tail)	Replaced by clay minerals(?), zeolites(?) and alkali feldspar(?).
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase	15?	20			0.2	An54	Skeletal (swallow-tail), few are euhedral	Replaced by clay minerals(?), zeolites(?) and alkali feldspar(?).
Clinopyroxene	1	1					Skeletal, branching	It is part of the branching groundmass.
Orthopyroxene								
Olivine		3			0.2		Euhedral	Replaced by carbonate, green clay minerals, and iron oxyhydroxide.
Opaques	1	1			0.01		Euhedral, skeletal	Concentrated around spherulites.
Glass		73						Replaced by brownish branching clay minerals(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	75?				Plagioclase, olivine, glass	
Chlorite						
Zeolites	?					
Carbonates	2				Olivine	
Amphiboles						
Epidote						
Other	5?				Plagioclase	Alkali feldspar(?)

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles		1					
Amygdules	1					Green clay mineral, carbonate.	

COMMENTS: Spherulites of a green clay mineral rimmed by opaque minerals are observed in the groundmass. Plagioclase both as phenocrysts and in groundmass is preserved to some degree. In altered grains, sodium-rich rims are often preserved. The groundmass consists of branching minerals, presumably primary, embrionic clinopyroxene, as well as either clay minerals or zeolites. Identification of alteration products of glass is only tentative.

TS: 132 195-1201D-48R-3, 76-79 cm (Piece 7C) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Highly altered moderately plagioclase-olivine phyric basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Spherulitic, branching, hyalopilitic, intersertal**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase	1.5	2		1.6	1.2	An68	Euhedral	
Clinopyroxene								
Olivine		<1		2			Euhedral	Replaced by clay minerals(?).
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase	35	40			0.15	An69	Skeletal, euhedral	Replaced by clay minerals(?).
Clinopyroxene	1	1				Mg-rich	Branching, anhedral	
Orthopyroxene								
Olivine		3			0.1		Euhedral	Replaced by zeolites(?), clay minerals(?), and sometimes carbonate.
Opaques	3	3					Dendritic	Some grains of Cr-spinel(?).
Glass		51						Devitrified to clay minerals(?), and zeolites(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	60?				Glass, olivine, plagioclase	
Chlorite						
Zeolites	?				Olivine, glass	
Carbonates	<<1				Olivine	
Amphiboles						
Epidote						
Other						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Fracture	Upper right				Void	

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

COMMENTS: Identification of alteration products of glass is only tentative. Plagioclase grains are sometimes completely empty, which may be an effect of preparing the thin section, where alteration products have been ground out.

TS: 133 195-1201D-48R-4, 18-21 cm (Piece 3) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Very highly altered sparsely plagioclase phyric basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Spherulitic, intersertal**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase	<1	1			1	An58	Euhedral	Replaced by clay minerals(?) and a few by iron oxyhydroxide.
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase	3	8				An49	Skeletal (swallow-tail), euhedral	Replaced by clay minerals(?) and few by iron oxyhydroxide.
Clinopyroxene	<<1	<<1					Subhedral, branching	
Orthopyroxene								
Olivine		3			0.3		Euhedral, few are skeletal	Replaced by iron oxyhydroxide and green clay minerals(?).
Opaques	2	2					Dust-like	Outline the branching and spherulitic clay minerals.
Glass		85						Devitrified to green platy and brown spherulitic clay minerals(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	93				Glass, olivine, plagioclase	
Chlorite						
Zeolites	?					
Carbonates						
Amphiboles						
Epidote						
Other						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
fracture	Through T.S.			0.05	Clay mineral, iron oxyhydroxide, and zeolites	

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles		1					
Amygdules	1					Clay minerals	Green spherulites.

COMMENTS: Sample of quenched pillow margin. Altered plagioclase and olivine microphenocrysts (0.05-0.5 mm) have a tendency to cluster. There is an increasing number of groundmass plagioclase crystals away from the margin. Plagioclase phenocrysts found at the margin have formed before eruption. Sodium-rich rims are preserved on the plagioclase phenocrysts where the interior is completely altered. The pillow margin (upper portion of thin section) has green, fractured, less altered glass preserved. Spherulites represent a later stage of alteration, some containing mineral pseudomorphs such as plagioclase. Identification of alteration products of glass is only tentative.

TS: 134 195-1201D-48R-2, 38-41 cm (Piece 1b) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Completely altered moderately plagioclase-olivine phyric basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Branching, intersertal**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase	<< 1	2		1.5	1	An55	Euhedral, skeletal, elongated	Preserved sodium-rich rims, interior replaced by clay minerals(?), zeolites(?), and alkali feldspar(?).
Clinopyroxene								
Olivine		<1		1.5	0.5			Replaced by iron oxyhydroxides, clay minerals(?) and zeolites(?).
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase	1	15			0.2		Skeletal	Preserved sodium-rich rims, interior replaced by clay minerals(?), zeolites(?), and alkali feldspar(?).
Clinopyroxene	2	2			0.02		Subhedral, branching	Small grains in groundmass.
Orthopyroxene								
Olivine		3			0.2		Euhedral	Replaced by iron oxyhydroxides, clay minerals(?) and zeolites(?).
Opaques	1	1					Dusty	
Glass		71						Replaced by clay minerals(?), and zeolites(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	78				Glass, olivine, plagioclase	
Chlorite						
Zeolites	10				Plagioclase, olivine, glass	
Carbonates	3				In vein	
Amphiboles						
Epidote						
Other						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
	Across center			0.4	Carbonate, iron oxyhydroxides	

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles	4	5					Rimmed by greenish colloform clay mineral.
Amygdules	1					Carbonate, zeolite(?)	

COMMENTS: Phenocrysts of plagioclase and olivine tend to cluster. Identification of alteration products of glass is only tentative.

TS: 135 195-1201D-49R-1, 145-147 cm (Piece 14C) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Very highly altered sparsely plagioclase phyric basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Branching, intersertal**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase	<1	1		1.4	0.6	An64	Euhedral	Sodium-rich rims preserved. Interior replaced by clay minerals(?).
Clinopyroxene								
Olivine		<1			0.6		Euhedral	Replaced by clay minerals(?), iron oxyhydroxide and carbonate.
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase	5	15			0.3	An62	Skeletal (Swallow-tail)	Replaced by clay minerals(?).
Clinopyroxene	10	10					Branching	
Orthopyroxene								
Olivine		2?			0.2		Euhedral	Replaced by clay minerals, iron oxyhydroxide and carbonate(?).
Opaques	1	1					Elongated, euhedral	
Glass		68						Replaced by clay minerals(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	76				Glass, olivine, plagioclase	
Chlorite						
Zeolites	?					
Carbonates	4				Olivine	
Amphiboles						
Epidote						
Other						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles		3					
Amygdules	3					Carbonate, zeolites(?)	Rimmed by green clay minerals.

COMMENTS: Altered plagioclase and olivine have a tendency to form clusters. Some amygdules are rimmed by clay minerals and have carbonate in the interior. Small equant plagioclase microliths in the groundmass are fresh. Clinopyroxene forms branch in the groundmass. Identification of alteration products of glass only tentative.

TS: 136 195-1201D-49R-2, 131-133 cm (Piece 14) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Completely altered sparsely plagioclase phyric basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Branching, intersertal, spherulitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase	<1	1		1.3		An50	Euhedral	Na-rich rims are preserved. Replaced by clay minerals(?) and carbonate.
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase	2	10			0.2	An62	Skeletal, elongated	Replaced by clay minerals(?).
Clinopyroxene	1	5			0.05		Branching, subhedral	Forms spherulites together with plagioclase.
Orthopyroxene								
Olivine		2			0.2		Euhedral	Replaced by clay minerals(?) and carbonate.
Opaques	1	1						Concentrated along the rim of the branching clay minerals in the groundmass.
Glass		78						Devitrified to branching clay minerals(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	90				Glass, plagioclase, olivine	
Chlorite						
Zeolites						
Carbonates	2				Olivine	
Amphiboles						
Epidote						
Other						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles		3					
Amygdules	3					Carbonate	

COMMENTS: Altered plagioclase and olivine grains form glomerocrysts. The percentage of fresh plagioclase in the groundmass varies through the thin section. Identification of alteration products of glass is only tentative.

TS: 137 195-1201D-51R-1, 19-21 cm (Piece 4) **Unit 1** **OBSERVER: MD, IS, MK**

ROCK NAME: **Highly altered aphyric basalt**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Spherulitic, branching, intergranular, subophitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase	<<1	<1					Euhedral	Replaced by clay minerals(?) especially in the Ca-rich interior. Sodium-rich rims are preserved.
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase	20	30			0.2	An50	Skeletal to euhedral	Replaced by clay minerals(?) especially in Ca-rich interior. Sodium-rich rims are preserved.
Clinopyroxene	15	15			0.05	Mg-rich	Branching, subhedral	
Orthopyroxene								
Olivine		5			0.2		Euhedral	Replaced by clay minerals(?).
Opaques	2	2			0.03		Euhedral to skeletal	Randomly distributed.
Glass		47						Replaced by clay minerals(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	62?				Glass, plagioclase, olivine	
Chlorite						
Zeolites						
Carbonates						
Amphiboles						
Epidote						
Other						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Fractures?	Center				Iron oxyhydroxide	

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles	1	1					
Amygdules							

COMMENTS: Small equant grains of plagioclase are fresh. Plagioclase and clinopyroxene sometimes form radiating intergrowths. Identification of alteration products of glass is only tentative.

TS: 138 195-1201D-52R-1, 78-80 cm (Piece 7A) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Completely altered aphyric basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Intersertal, branching, felty**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase	<<1	<1		1.2		An70	Euhedral, elongated, skeletal	Replaced by carbonate and clay minerals(?). Na-rich rims are preserved.
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase	5?	15			0.2	An70	Skeletal (swallow-tail)	Replaced by clay minerals(?). Na-rich rims are preserved.
Clinopyroxene	<1	<1		0.05			Branching and subhedral	
Orthopyroxene								
Olivine		1		0.4	0.1		Euhedral	Replaced by clay minerals(?).
Opaques					0.05		Euhedral and skeletal	Concentrated along grain boundaries in the groundmass.
Glass		83						Devitrified to clay minerals(?), and zeolites(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	95?				Glass, plagioclase, olivine	
Chlorite						
Zeolites	?				Glass?	
Carbonates						
Amphiboles						
Epidote						
Other						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles							
Amygdules							

COMMENTS: Identification of alteration products of glass is only tentative.

TS: 139 195-1201D-53R-1, 78-80 cm (Piece 11B) **Unit 1** **OBSERVER: MD, IS, MK**

ROCK NAME: **Highly altered sparsely phyric basalt**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Branching, spherulitic, subophitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase	<1	1			1		Euhedral, skeletal	Sodium-rich rims preserved. Replaced by clay minerals(?), alkali feldspar, and zeolites.
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase	10	15			0.2	An72	Skeletal, elongated	Replaced by clay minerals(?).
Clinopyroxene	20	20		0.1			Branching, subhedral	Subhedral grains have undulatory extinction.
Orthopyroxene								
Olivine		3		0.4	0.1		Euhedral	Replaced by clay minerals(?), and hematite.
Opaques	5	2					Small grains, sometimes elongated	Including secondary hematite after olivine.
Glass		59						Replaced by clay minerals(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	64?				Glass, plagioclase, and olivine	
Chlorite						
Zeolites	<1?				Olivine(?), plagioclase(?)	
Carbonates						
Amphiboles						
Epidote						
Other						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles							
Amygdules							

COMMENTS: Identification of alteration products after glass is only tentative.

TS: 140 195-1201D-53R-1, 81-84 cm (Piece 12) **Unit 1** **OBSERVER: MD, IS, MK**

ROCK NAME: **Highly altered moderately plagioclase phyric basalt**

GRAIN SIZE: **Fine-grained**

TEXTURE: **Felty, intersertal, intergranular, subophitic, glomeroporphyritic, branching**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase		2		1.2	0.7		Euhedral	Replaced by alkali-feldspar.
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase	1	15				An68		Replaced by alkali-feldspar. Na-rich rims are preserved.
Clinopyroxene	20	20		0.1		Mg-rich	Anhedral, branching	Sometimes clinopyroxene forms spherulites.
Orthopyroxene								
Olivine		7		0.5	0.2		Euhedral	Replaced by iron oxyhydroxides (hematite?), and clay minerals.
Opaques	7	2					Skeletal	Concentrated at the boundaries of brownish clay minerals.
Glass		34						Replaced by branching brown clay minerals(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	42				Glass, olivine	
Chlorite						
Zeolites						
Carbonates						
Amphiboles						
Epidote						
Other	10				Plagioclase	Alkali-feldspar.

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles		20					Very large and irregular in shape.
Amygdules	20					Zeolites (?) (R<1.52)	Rimmed by green clay minerals.

COMMENTS: Identification of alteration products after glass is only tentative. Two different colored clay minerals(?) in the groundmass: a brownish one forming branching texture, and a green one forming patches. Some places along the rim of the large vesicle there are green clay minerals derived from altered glass(?). The sudden reappearance of highly altered plagioclase may represent the upper part of a new flow unit.

TS: 141 195-1201D-54R-1, 41-43 cm (Piece 4) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Completely altered sparsely plagioclase-olivine phyric basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Felty, hyalopilitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase		1		1	0.8		Euhedral, skeletal	Replaced by alkali-feldspar, carbonate and zeolites.
Clinopyroxene								
Olivine		<1		1			Euhedral	Replaced by iron oxyhydroxides (Hematite ?).
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase	5	10			0.02	An68	Skeletal	Replaced by alkali-feldspar and clay minerals(?). Na-rich rims are preserved.
Clinopyroxene	<<1?	<<1?					Anhedral	
Orthopyroxene								
Olivine		15(?)		0.1			Euhedral (larger grains), and anhedral (smaller grains).	Replaced by iron oxyhydroxides (Hematite ?) + ?
Opaques	15	2					Euhedral	Some presumably oxidized former magnetite. Secondary hematite after olivine.
Glass		70						Devitrified to brownish and green clay minerals(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	72?				Glass, plagioclase	
Chlorite						
Zeolites	<<1				Plagioclase	
Carbonates	5				Plagioclase	
Amphiboles						
Epidote						
Other	1				Plagioclase	Alkali feldspar

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
	Upper T.S.			1	Carbonate	Small auxiliary veinlets.

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles	1	2					Clay mineral rims.
Amygdules	1					Green clay mineral spherulites	

COMMENTS: Identification of alteration products of glass is only tentative. Some part of the branching groundmass may be made up of clinopyroxene crystallites that do not show evident optical properties.

TS: 142 195-1201D-54R-1, 97-100 cm (Piece 11) | **Unit 1** | **OBSERVER: MD, IS, MK**

ROCK NAME: **Highly altered sparsely plagioclase phyric basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Felty, spherulitic, intersertal, subophitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase		2		1.2			Euhedral, skeletal	Replaced by alkali-feldspars and zeolites.
Clinopyroxene								
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase	1	15			0.2		Skeletal	Replaced by alkali feldspar, clay minerals(?), zeolites(?), and carbonate. Na-rich rims are preserved. Strongly zoned.
Clinopyroxene	20	20			0.1		Branching to euhedral	
Orthopyroxene								
Olivine		1			0.2		Euhedral	Replaced by iron oxyhydroxides (Hematite?), and clay minerals(?).
Opaques	10	2					Euhedral	Hematite(?) patches diffused, particularly in central part.
Glass		60						Replaced by iron oxyhydroxides, clay minerals(?), and zeolites(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	51?				Glass, olivine, plagioclase	
Chlorite						
Zeolites	15					
Carbonates						
Amphiboles						
Epidote						
Other	3				Plagioclase	Alkali feldspar

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles							
Amygdules							

COMMENTS: The thin section includes a pillow margin, with fragments of hyaloclastite, as well as interpillow sedimentary material. The groundmass material (glass and microliths) shows transition from branching texture close to the pillow rim, to spherulitic texture and larger grain sizes furthest from the rim. A dark-colored halo is observed approximately parallel to the pillow rim. Identification of alteration products of glass is only tentative.

TS: 143 195-1201D-55R-1, 43-43 cm (Piece 5G) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Moderately altered moderately plagioclase-clinopyroxene phyric basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Subophitic, intergranular**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase	<2	2		1.2		An75	Subhedral, laths	Some places replaced by carbonate, zeolites and clay minerals. Na-rich rims preserved.
Clinopyroxene	1	1		0.7			Anhedral	
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase	15	20			0.3	An70	Subhedral, lath	Some exhibit zoning. Replaced by clay minerals(?)
Clinopyroxene	40	40			0.1	Mg-rich	Anhedral, subhedral	Some show undulatory extinction.
Orthopyroxene								
Olivine		5					Euhedral	Replaced by clay minerals(?) and iron oxyhydroxides.
Opaques	13	10			0.05		Euhedral	Hematite included after olivine.
Glass		21						Replaced by clay minerals(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	28				Glass, plagioclase, olivine	
Chlorite						
Zeolites						
Carbonates	1				Plagioclase	
Amphiboles						
Epidote						
Other						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles		1				Carbonate	
Amygdules	1						

COMMENTS: Identification of alteration products of glass is only tentative.

TS: 144 195-1201D-55R-1, 103-106 cm (Piece 5r) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Moderately altered moderately clinopyroxene-plagioclase phyric basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Subophitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase	1.5	2		1.1	0.6		Euhedral, laths	Replaced by carbonate and clay minerals(?).
Clinopyroxene	5	5		1.3	0.8	Mg-rich	Anhedral	
Olivine								
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase	20	25			0.3	An68	Subhedral, laths	Zoning. Replaced by clay minerals(?).
Clinopyroxene	35	40			0.25		Anhedral, small grains euhedral	
Orthopyroxene								
Olivine		3?			0.1		Euhedral	Replaced by iron hydroxide? Original grains difficult to identify.
Opaques	13?	10			0.02		Euhedral, anhedral	
Glass		15						Replaced by clay minerals or zeolites.

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	25?				Glass, plagioclase, olivine	
Chlorite						
Zeolites	?					
Carbonates	<1				Plagioclase	
Amphiboles						
Epidote						
Other						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles							
Amygdules							

COMMENTS: Identification of alteration products of glass is only tentative.

TS: 145 195-1201D-55R-2, 19-20 cm (Piece 1B) **Unit 1** **OBSERVER: MD, IS, MK**
ROCK NAME: **Moderately altered aphyric basalt**
GRAIN SIZE: **Fine-grained**
TEXTURE: **Subophitic**

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm) min.	max.	av.	APPROX. COMP.	MORPHOLOGY	COMMENTS
PHENOCRYSTS								
Plagioclase		<1		1.2			Euhedral, lath	Na-rich rims preserved. Replaced by alkali feldspar and zeolites; otherwise fresh.
Clinopyroxene								
Olivine		<1		0.7			Euhedral	Replaced by clay minerals, zeolites, and iron oxyhydroxides.
Orthopyroxene								
Opaques								
GROUNDMASS	**PERCENT PRESENT**	**PERCENT ORIGINAL**						
Plagioclase	25	35			0.2	An70	Subhedral, lath	Zoning. Na-rich rims preserved. Replaced by alkali feldspar and zeolite, otherwise fresh.
Clinopyroxene	40	40			0.1		Anhedral	
Orthopyroxene								
Olivine		5?			0.1		Euhedral	Replaced by iron oxyhydroxides (hematite?)
Opaques	15	5			0.03		Euhedral, anhedral	Hematite after olivine(?).
Glass		15						Replaced by clay minerals(?).

SECONDARY MINERALOGY	PERCENT	SIZE (mm) min.	max.	av.	REPLACING	COMMENTS
Clay minerals	19				Glass	
Chlorite						
Zeolites						
Carbonates	1				In vein	
Amphiboles						
Epidote						
Other						

VEINS	LOCATION	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
	Across T.S.			0.2	Carbonate	

CAVITIES	PERCENT	PERCENT	SIZE (mm) min.	max.	av.	FILLING / MORPHOLOGY	COMMENTS
Vesicles							
Amygdules							

COMMENTS: Iron oxyhydroxides form patches which may or may not be after former olivine grains. Identification of alteration products of glass is only tentative.