	1,125 M	2,23	5, 84 M
TEXTURE:		100	
Sand	95	20	15
Sitt	5	5	80
Clay	***	75	5
COMPOSITION:			
Accessory minerals	Tr		5
Clay		20	5
Foraminilers	90	15	10
Glass	10	15	80
Nannolossils	Tr	50	-
Citizaliandiatas		T.	1000

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
แษ็บเห็นบ		1			WW 0000 MM	s	10YR 3/4	CLAYEY NANNOFOSSIL OOZE Major lithology: CLAYEY NANNO- FOSSIL OOZE, dark yellowish brown (10YR 3/4 to 10YR 4/4), generally homogenous with scattered purnice
1		2		on almonn	M	S	10YR 4/3	pebbles and mottling. Minor lithologies: CLAYEY VITRIC NANNOFOSSIL MIXED SEDIMENT WITH FORAMS occurs within the major lithology as burrow infillings. This lithology may comprise up to 10% of the sediment volume. A graded layer of FORAM OOZE WITH GLASS occurs in Section 1, 122–126 cm. A discontinuous, normally graded layer of FORAM OOZE occurs in Section 4, 23–127 cm. A fining-upward bed of VITRIC SILT WITH FORAMS occurs in Condine 50, 00 cm.
munumunum		4 5		◇		S	10YR 4/4	Section 5, 69–66 cm.



135-837A-2H		SITE 837 HOLE /	A CORE 2H		CORED 8.0 - 17.5 mbsf	837A-2H 1	2 3	4	5	6 7
1, 16 1, M M	1,31 4,103 6,102 M M D	Weter Graphic U Lith. S V S C S C S	Sturbo Sample	Color	Description	5	-	-		
Sand 20 5 Silt 75 66 City 5 30 COMPOSITION: Accessory minerals Tr 3 Clay 22 Feldspar 5 7 Forarninifers 5 10 (Glass 85 66 Nanolossiis 5 5	5 10 55 75 50 15 55 15 5 7 5 Tr 10 Tr Tr 50 75 95 5		+F S S S	10YR 4/3 10YR 4/3 10YR 4/3 10YR 4/3 10YR 4/3	CLAYEY NANNOFOSSIL OOZE and CLAYEY NANNOFOSSIL OOZE WITH FORAMS Major lithologies: CLAYEY NANNOFOSSIL OOZE, brown (10YR 4/3) to dark brown (10YR 3/3), generally structureless and homogeneous with slight motting due to burrows. The sediment contains pumice pebbles up to 8 mm in diameter. CLAYEY NANNOFOSSIL OOZE WITH FORAMS, brown (10YR 4/3). Minor lithologies: VITRIC SANDY SILT and VITRIC SILTY SAND, light brownish gray (10YR 6/2) to light yellowish brown (10YR 6/2) to light yellowish brown (10YR 6/2) to light yellowish brown (10YR 6/2) to light naf vitralic SILT, very dark grayish brown (10YR 4/3) occur in Section 4, 97–104 cm, and in Section 5, 88–91 cm and 120–126 cm.					

130-135-

140----

145-

150--

916

SITE 837

-

-

ζ	1	2	
;	_	3	
t	I	j	
ć	×	5	
ţ		Ś	
1	-	1	



CORED 17.5 - 27.0 mbsf

Description

CLAYEY NANNOFOSSIL OOZE WITH

Major lithologies: CLAYEY NANNO-FOSSIL OOZE WITH FORAMS, brown

(10YR 4/4) and yellowish brown (10YR 5/4). This lithology is generally

homogenous with only slight mottling. VITRIC SILT and VITRIC SILT WITH CLAY, gray (5YR/1) to olive gray (5Y

4/2 to 5Y 5/2), occuring in thick- to very

thick-bedded units, and often showing

planar-lamination and upward fining

Minor lithologies: None.

(10YR 4/3) to dark yellowish brown

FORAMS, VITRIC SILT and VITRIC

SILT WITH CLAY

135-837A-3H SMEAR SLIDE SUM	MARY (1	s):						SIT	E 837 H	101	E	A CO	RE	3	Н
	1, 50 D	1,95 D	1, 110 M	2,60 D	2, 118 D	3, 22 D	3,59 M	Meter	Graphic Lith.	ection	Age	Structu	re	listurb	
TEXTURE:								H		S			4	-	1
Sand		30			-		-	13				T*=	=	H	
Sit	94	60	20	83	91	87	5		·····	1			_	i I	
Clay	6	10	80	17	9	13	95	10.01		1.			- 1	i I	
COMPOSITION:								1.0		Ľ		**		1	
Accessory minerals			Tr	Tr		Tr	Tr	13	1111				-	!	
Clay	3	5	30	10	5	6	30	1 - 1					- 1	11	
Feldspar	2	Tr			Tr	2	Tr	17	- 1				- 1	11	
Foraminiters	2	2	10	3	1	2	5	1 3	· + + .				- 1		
Glass	90	88	8	80	90	85	Tr	1 13					_ 1		
Nannolossils	3	5	52	7	4	5	65	13	:				-1		
								13		2		≡ ↑ F	.		
SMEAR SLIDE SUM	MARY (?	6):						13	- - -			≣`″	1	i I	
	4,70	CC, 10						13						il	
	D	M						1 3				I= TF	- 1	i I	
TEXTURE:											ŝ	Ξ .		i I	
Sand		-						13	1-11	2	8	- 3 -	~ I	H	
Silt	10	40						1 -	t	3	22	2		31	
Clay	90	60						1.4	£.4.		e.	2 2	- 1	H	
COMPOSITION:								11	도도는		Ner	Ĭ.		H	
Accessory minerals	Tr	Tr						13	1-1		2	5	- 1	i I	
Clav	30	10						1 7	1-1-1			2	- 1	11	
Feldsoar		Tr						1 - 1	+ + +		Ē	3	- 1	11	
Foraminilers	8	Tr						1 +	计计算机	1.1	8	2	- 1	i I	
Glass	ě.	85						1 4	1-17	4	유	05	- 1	i I	
Nannoforeile	80	5						1.3	1. 1. 1.		-22		- 1	11	
NationUssits	00	0						13.	F - 1		n all	3	1	11	
								17	+++		0	3	- 1	11	
								14		-	P	3	- 1	11	
								1 1	h		12		- 1	11	
								1 1		0.1	~	0 3	1	i I	
								1 +	1			5	- 1	i I	
									_						

In the second se

\$ Ŷ 0

5

3

Sample Color

SS

S

S

S

s

S

5Y S

10YR 4/3 To 5Y 4/2

5Y 6/2 To 5Y 5/1

10YR 5/4 To 10YR 4/3

10YR 5/3

10YR 4/3

10YH

S

trends.

135-837A-4H		22.5						SITE 837	HOLE	A COF	RE 4	н		CORED 27.0 - 36.5 mbsf	837A-4H 1	2	3 4	5	6	CC	1
SMEAR SLIDE SUM	1, 10 D	6): 1, 14! D	5 2, 124 D	1 3,61 D	3, 84 D	4 3, 14 D	42 4,95 D	Graph W Lith.	Section	Structur	Disturb	Sample	Color	Description	5						
TEXTURE: Sand Sili COMPOSITION: Accessory minerals Clay Feldspar Foraminilers Glass Nannolossils SMEAR SLIDE SUMI TEXTURE:	1, 10 D 75 25 6 1 90 3 MARY (9 5, 14 D	1, 14: D 90 10 Tr 6 Tr 90 4 (): 0,70 D	5 2, 12 D 85 15 Tr 6 Tr 7 90 4 6, 84 D	4 3, 61 D 10 80 10 Tr 6 Tr 7 F 90 4 CC, 21 D	3,84 D 35 55 10 Tr 6 Tr 1 90 3	4 3, 1, D 20 70 10 Tr 6 Tr 1 90 3	42 4,95 D 35 55 10 Tr 6 Tr 90 4			Structur	Distu	samp on samp	9 0 10YR 4/4 10YR 6/3	Description VITRIC SILT WITH CLAY and SILTY VITRIC SAND WITH CLAY Major lithologies: VITRIC SILT WITH CLAY, dark yellowish brown (10YR 4/4) to pale brown (10YR 6/3). This lithology grades downward into VITRIC SILT WITH SAND AND CLAY, gray (10YR 5/1), which again grades downward into SANDY VITRIC SILT WITH CLAY, gray (5Y 5/1). At the base of this sequence there is SILTY VITRIC SAND WITH CLAY, gray (5Y 5/1). In the lowermost part of the core there is VITRIC SILT WITH CLAY and CLAYEY VITRIC SILT, both are light	5 10 15 20 25 30 35 40 45 4						
Sand Sill Clay COMPOSITION: Accessory minerals	20 70 10	50 42 8	85 15 Tr	 70 30 Tr					no - I ower Plaiet			s s		greenish gray (10Y 6/22). Minor lithology: None.							-
Glay Feldspar Foraminifers Glass Nannofossils Rook fragment	6 Tr 1 90 3 Tr	3 2 88 4 	10 Tr 85 5 	10 Tr 85 5 -							F	S I S	5Y 5/1								
									6			s s	10YR 6/2								

120-

125-130-

135-140-145-

150-

HV

53

918

SITE 837

-

-

1 1 1

-





135-837A-6H								SITE 837	HO	LE .	A COF	RE 6	H		CORED 46.0 - 55.5 mbsf	837A-6H 1	2	3	4	5	6	7
SMEAR SLIDE SUM	1,80 D	2, 20 D	3, 70 D	4,40 D	4, 10 D	00 4, 14 D	46 5,28 D	Graph W Lith.	Section	Age	Structur	Disturb	ample	Color	Description	5						
TEXTURE: Sand Sill Clay	40 52 8	60 33 7	50 40 10	55 40 5	60 35 5	70 25 5	73 15 12	0.5			Î	F	0		SILTY VITRIC SAND WITH CLAY Major lithologies: SILTY VITRIC SAND	IO						
COMPOSITION: Accessory minerals Clay Feldspar Foraminiters Glass Nannolossils	1 5 1 Tr 90 3	1 5 2 Tr 90 2	1 5 1 Tr 90 3	10 3 10 Tr 75 2	10 3 10 Tr 75 2	10 3 10 Tr 75 2	30 8 15 44 3		2				s	5Y 5/1	WITH CLAY, gray (5Y 5/1) grading downwards into medium- and then coarse-grained VITRIC SAND. In Section 4, the proportion of plagioclase feldspar and accessory minerals, mostly augite, increases to more than 10%.							
SMEAR SLIDE SUM	MARY (Ka):						13000							Minor lithology: CLAYEY	35				10.00		
TEXTURE:	5,37 D	5, 63 D	5, 13 D	0 6,87 D	CC,7 D	7									NANNOFOSSIL OOZE, dark yellowish brown to dark brown (10YR 4/4 to 10YR 4/3). Mud diapirs and dewatering structures are very common in the	40						
Sand Silt	2	5	8	10	3			133300	3				S		oozes.		AND A		Rie II			
Clay	98	95	92	90	97			13400	1							50		2020	Starsel	Ball State		
COMPOSITION:								13380	tL.	ŝ				⊢	4	55-6-6-6-	12000-	-	1203-	-0.55		
Accessory minerals Clay	30	Tr 30	Tr 30	Tr	30				1	isto						60				1256		
Feldspar Foraminiters	Tr 2	Tr 5		10					11,	Ple			S	5Y 5/1	1		2338		1000			
Nannolossils	68	65	62	60	ଟ					Wer			c	To 5Y		65-22-	1000	35				-
									11	۲	É		3	2.5/1		70-	1000					
									11-		≣		S			-		1.45	1000	6384		
								1 HAR	7.		3 1	1	sS	5V	1	75-		-Have		C. C.		-
								1355	- 5		3 17		S	5/4	J	80-			10000	Carlos -	100.0	
								1221		11	n			INYR		-		12.2	1000	Constant of	1.000	
								1 3440	-		T		pS,	4/3		85-	32.5	1.5.5	1.0.0	TO BE	100-01	-
								王子		11	R	-li				90-0		ALC: NO		-		-
								1 - 소 대	-	11	TT IT	11				-		21-21	1000		1111	1
								1 1 2 2	6		17					85-			12.5			
								1 관련			T			10YR	1	100						CC
								목감	-	4	R			4/4	1	-	CORE I	357		TO SHE		No.
								1355	- 7		R	-li				105-	10-22	1000		1 Section		
								1121	-	11	"		s			110-0-	10000		TOP-	- 100000-		120-
								12273	- 00			1				-	ALC: NO	100	HAR	No. State		
																115	1000	Contraction of the second	1	NO.		
																	12324	anti-	1 20 -			- 675
																105			Castal P			
																125-	In Design	2	1 Aler	And the second		
																130-		25-22	- Carry	-		_

135 -140 -145 -

150-

-

920

SITE 837

-

135-837A-7H		197						SIT	E 837 H	101	E	A CORE	7	Н		CORED 55.5 - 65.0 mbsf
SMEAR SLIDE SUM	1,65 D	e): 2, 120 D	2, 141 M	2, 144 D	3, 25 D	3, 56 M	3,59 D	Meter	Graphic Lith.	Section	Age	Structure	Disturb	sample	Color	Description
TEXTURE:								H		-	Н	03	1			VITRIC SAND WITH SILT AND CLAY
Sand	***	***	50	***		70		- E	111			03	1			VITRIC SILT WITH SAND AND CLAY
Sill	8	55	35	70	60	20	45	0.5				3	H	e		and CLAYEY VITRIC SILT WITH
Clay	92	45	15	30	40	10	35	13		1		3	lil	3		NANNOFOSSILS
COMPOSITION:								1.0	221			3				
Accessory minerals	Tr	Tr	Tr		Tr	Tr	Tr	13	22]			S S	H		10YB	Major lithologies: Three major and a
Clay	30	35	10	20	30	6	25	1 -			1	2	1 I		4/4	number of minor fining-upward
Dolomite				Tr								5			AB160	sequences can be defined. They start
Feldspar	Tr	Tr	Tr	Tr	Tr	Tr	Tr	1.3				3				at the base with VITRIC SAND WITH
Foraminiters	3	Tr	Tr	Tr	Tr	8	Tr	13	111	-		2				CILT AND OLAY with palars uppying
Glass	5	55	85	72	60	82	45	13	177	2		Ś				SILT AND CLAY with colors varying
Nannolossils	62	10	5	8	10	4	30	13				3	11	1.1		from yellowish brown (10YR 5/4) and
SMEAR SLIDE SUM	MARY (9	6):										↓ F	i	s s		(10YR 6/1), light olive gray (5Y 6/2) and pale olive (5Y 6/3), lipwards the
	4,21	4,47	4, 62	5,130	6, 108	6, 119		13	it_				1	S		sediment grades are transitions into
	D	M	D	D	D	D		13				AF =				CLAYEY VITRIC SILT WITH
TEXTURE:										3		↑ F	i I	SS		NANNOFOSSILS, brown (10YR 5/3)
Sand		50	-	30	45	45		1.3		11	11					and VITRIC SILT WITH SAND AND
Sitt	70	40	50	45	35	43		1.3	·····		1	+r +r				CLAY vellowish brown ((10VB 5/4)
Clay	30	10	50	25	20	12		E								CEAT, Jelowan Clown ((10111 34).
COMPOSITION:											11	. =	li	8		Minor lithologies: VITRIC SAND,
Accessory minarale	Tr	T.	T.	Te	Te	T.		1 3			11		111		10YH	yellowish brown to pale olive gray (5Y
Clay	15		30	21	12			-	·	-	1 1		111	20	10 To	6/3 to 10YR 5/4). These sediments are
Feldsonr	Tr	1	Tr	Tr	Tr	Tr		13	······ H	4	1			3	10YB	graded and occur near the base of
Foraminilare	Tr	2	Te		3				·····			1 1	111		5/3	fining unward units OLAVEY
Glass	73	88	60	85	80	79		13			1	2 17	111			Innig-opward units. OLATET
Nanooloceile	8	3	10	10	5	5		1 3	·····				111			NANNOFOSSIL OOZE, dark yellowish
Namolossis	0	3	10	10	5	9		14		_			H			brown(10YR 4/4), occurs in the upper
								13					1			part of the sequence.
										5			i			
										2		=				
								13				3 -				
														S		
										-	1	+ c -				

10YR 5/4

> 5Y 6/3

S

Ξ

 \equiv

Ξ



%):	SITE 837 HOLE	A CORE 8H		CORED 65.0 - 74.5 mbsf	837A-8H 1	2 3 4	5 6 7
4, 110 5, 60 6, 100 M D D	Graphic Lith, Weter View	Structure Disturbe	Color	Description	5		
60 15 36 15 55 66 25 30 0 Tr 25 30 1 5 Tr 2 2 20 70 95 Tr Tr 50		$ \begin{array}{c} \circ \\ \circ \\ \circ \\ \bullet \\$	P 10YR 473 10YR 473 10YR 473 10YR 544 10YR 10YR 10YR 573 57 6/2 10YR 574 10YR	VITRIC SILT, CLAYEY VITRIC SILT, VITRIC SAND and CLAYEY NANNOFOSSIL OOZE Major lithologies: VITRIC SILT and CLAYEY VITRIC SILT, light olive gray to brown (10YR 5/3 to 5Y 6/2) are present in the upper parts of thick fining-upward units and as thin (3–14 cm) graded intervals in Section 3. In Sections 5, 6, 7, and CC the sediments are massive and structureless. VITRIC SAND, light gray (10YR 7/1) occurs in Sections 1 and 2. CLAYEY NANNOFOSSIL OOZE, brown to light yellowish brown (10YR 4/3 to 10YR 6/4). Minor lithologies: CLAYEY VITRIC SAND, very dark gray (10YR 3/1), occur in the lower part of fining-upward sequences. Layers of FORAM VITRIC SAND WITH ACCESSORY MINERALS and VITRIC SANDY GRAVEL, light gray (10YR 7/1), occur in Sections 1 and 2.			
					115	and the second s	

-120-125-130-135-140-145-

150-

-

135-837A-8H SMEAR SLIDE SUMMARY (* 1,55 M TEXTURE: Sand Silt Clay 90 10 0 COMPOSITION: Accessory minerals 10 Clay ---Foldspar 5 Foraminifers 25 Glass 60 Nannolossils ---Rock fragment ---

922

SITE 837

1

-

Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description
0.51				≎ ∱ᠮ ☰		s	2.5Y 6\2	CLAYEY NANNOFOSSIL OOZE, VITRIC SAND and CLAYEY VITRIC SILT
1. Sunhunhungun		2		• • •		s	10YR 4/3	Major lithologies: CLAYEY NANNO- FOSSIL OOZE, brown to dark brown (10YR 4/3 to 10YR 3/3). This lithology is massive, except for the presence of faint motting and rare pumice clasts scattered in the matrix. VITRIC SILT WITH CLAY and VITRIC SAND, dark gray to black (5Y 4/1 to 2.5Y 2/0). These lithologies form graded,
	清					s	2.5Y 2.0	fining-upward intervals, with eroded bases. Planar-lamination occurs at the base of some of the intervals, e.g. in
mummun		3					10YR 3/3	Section 1, 0–57 cm. In addition to major occurrences in Sections 4, 5, and the core catcher there are graded layers in Section 3. Minor lithology: In Section 2, 130–135 cm, there is a diffuse layer of
Indunt		4				s		NANNOFOSSIL CLAYEY VITRIC MIXED SEDIMENT, dark brown (10YF 3/3).
mini		5				s	5Y 5/3	
		cc					57 51	

SMEAR SLIDE SUM	WARY (9	6):				
	1,50	1,90	2, 135	3,34	4, 130	5,60
TEXTURE:	U	U	M	M	D	U
Sand	80	5	20	80	30	65
Sill	15		25	15	50	34
Clay	5	95	55	5	20	1
COMPOSITION:						
Accessory minerals	Tr	***	5	5	Tr	Tr
Clay	5	30	30	5	20	1
Feldspar	5	***	5		Tr	2
Foraminiters	5	5	5	Tr	Tr	2
Glass	85	Tr	30	90	80	96
Nannolossils	***	65	25	***		-

837A-9H	1	2	3	4	5	CC	
-						in the	
10						Ð	
15-					-		-
20-03	-				-	_	-
25-			100	J.R.S.	-	_	_
80-					-		
				Allente		1211	
35				(and the			
40			99			-	-
45	-				- 33	-	
50-					-	_	-
55-							_
					-		
			i Sin				
65							
70						-	-
75-							-
80-						-	L.
85-							_
50-							
95-			1				-
100			53.			-	-
105-						_	
110-						_	-
					1000		
-				1115			
120					1.0		
125-					80.0		-
130-					-	-	
135-		100			5.114		_
140-					10.55	-	
-							
-					100		1
150-0			-	- Conservation	-	_	
1 - 10		1 1 P		1			n

	1,75 D	2,40 M	3,70
TEXTURE:			~
Sand			
Silt	15	15	15
Clay	85	85	85
COMPOSITION:			
Accessory minerals		Tr	
Clay	30	30	30
Feldspar		Tr	
Foraminiters	10	15	10
Glass	5	Tr	5
Nannolossils	55	55	- 50

924

Meter	Graphic Lith.		Age	Structure	Disturb	Sample	Color	Description
111121112111		1				s	10YR 3/4	CLAYEY NANNOFOSSIL OOZE WITH FORAMS Major lithology: CLAYEY NANNOFOSSIL OOZE WITH FORAMS, dark yellowish brown (10YR
Innini		2		+ 0 3		s		3/4) to dark brown (10/FI 4/3). The sediment contains purnice clasts up to 7 cm in diameter in Section 2 and up to 2 cm in diameter in Section 3. Mottling is common in Sections 2 and 3.
munulmu		3		0~ 0 ~ 0 ~		S	10YR 4/3	Minor lithology: CLAYEY FORAM OOZE WITH GLASS occurs in Section 1, 117–130 cm.

WASHED 5.5-70.5 mbsf



SIT	E 837 H	10	E	B CORE	Ξ2	R		CORED 70.5 - 80.2 mbsf	8376
Meter	Graphic Lith.	Section	Age	Structure	Disturb	Sample	Color	Description	5
0.51110	<u></u>	1		=				CLAYEY NANNOFOSSIL CHALK Major lithology: CLAYEY NANNOFOSSIL CHALK, brown (10YR 5/3). Mottled and poorly sorted with grain sizes varying from clay to coarse	10
								sand. Minor lithology: None.	25

B-2R 1 45-50-55-60-65 | 70 | 75 | 90 | 85 | 90 | 95-100-120-125-130-135-140-145-150-



135-837B-2R-1

UNIT 1: SPARSELY TO MODERATELY PHYRIC CLINOPYROXENE PLAGIOCLASE BASALT

Pieces 1-17

CONTACTS: None.

PHENOCRYSTS:

- Plagioclase: 1%-3%; up to 5.5 mm; euhedral to subhedral; tabular; some contain small, included clinopyroxene crystals.
- Clinopyroxene: 1%-2%; up to 2.0 mm; subhedral, isolated crystals.
- GROUNDMASS: Very fine-grained, with vitreous linings to some of the larger vesicles.
- VESICLES: 10%-15%; <0.1-5.0 mm; rounded to coalescive; evenly disseminated (for smaller ones); vesicles dominantly <0.3 mm, rare larger vesicles erratically present throughout core. Conspicuous fine darker colored vesicle strings cut across nearly all pieces. These strings are 1 to 2 mm wide and have subhorizontal to 45° dips. Miaroles: No infillings.
- COLOR: 2.5Y 3/0, very dark gray.

STRUCTURE: Massive.

ALTERATION: Fresh.

VEINS/FRACTURES: <<1%; <<1 mm width; random orientations; fractures are rare and very thin; lined by brownish clayey material.

ADDITIONAL COMMENTS: Pieces 1, 8, 12, and 13 are finer grained than other fragments.

Fine scale vesicle grains



UNIT 1: SPARSELY TO MODERATELY PHYRIC CLINOPYROXENE PLAGIOCLASE BASALT

Pieces 1-25

CONTACTS: None visible.

PHENOCRYSTS: Phenocrysts appear to be unaltered.

Plagioclase: 1%; 2x3 mm; euhedral

Clinopyroxene: <1%; 1.5x2.2 mm; euhedral to subhedral, isolated grains.

GROUNDMASS: Fine-grained.

VESICLES: 10%-20%; <0.1 to 4 mm; rounded and coalescing; distributed throughout; form lines; vesicles often lined up in tracks and are sometimes elongated (see VCD);

vesicles are very rarely lined by a green smectite (?) material; most vesicles , 0.4 mm COLOR: 2.5YR 4/0 dark gray.

STRUCTURE: Massive.

ALTERATION: Fresh.

VEINS/FRACTURES: Some brownish clay(?) coatings on surfaces of some fragments. These may represent breaking of fragments along small fractures.

ADDITIONAL COMMENTS: Fractures are sometimes covered by a thin layer of a light brown soft material. Pieces 1, 7, and 17 are finer grained than other fragments.

Hesicle lines





135-837B-4R-1

UNIT 1: SPARSELY TO MODERATELY PHYRIC CLINOPYROXENE PLAGIOCLASE BASALT

Pieces 1-16

CONTACTS: None.

PHENOCRYSTS:

- Plagioclase: 1%-2%; up to 4.0 mm; euhedral to subhedral, tabular, commonly with intergrown or included clinopyroxene.
- Clinopyroxene: <1%; up to 2.0 mm; euhedral to subhedral, isolated crystals and intergrown with plagioclase.
- GROUNDMASS: Fine-grained, holocrystalline.
- VESICLES: 10%-15%; <0.1 to 17.0 mm; rounded to elongated; evenly distributed; vesicles predominantly <0.4 mm. Large vesicles very sporadically distributed.

Miaroles: Rare linings with brown clay(?) and reddish brown Fe-oxyhydroxides.

COLOR: 2.5YR 3/0 very dark gray.

STRUCTURE: Massive.

ALTERATION: Fresh.

VEINS/FRACTURES: Some surfaces of fragments have thin coating of brown clay(?) material, suggesting that these have broken along small fractures. ADDITIONAL COMMENTS: Piece 1 is finer grained than other fragments.

Fine scale vesicle trains



135-837B-5R-1

UNIT 1: SPARSELY TO MODERATELY PHYRIC CLINOPYROXENE PLAGIOCLASE BASALT

Pieces 1-10

CONTACTS: None visible.

PHENOCRYSTS:

- Plagioclase: 1%-2%; up to 5 mm; euhedral; tabular to equant; some contain small pyroxene inclusions.
- Clinopyroxene:<1%; up to 1 mm; euhedral to subhedral isolated crystals.
- GROUNDMASS: Fine grain holocrystalline to very fine-grained.
- VESICLES: 10%-15%; <0.1 to 4 mm; rounded to elongated and ininterlocking; distributed throughout; most vesicles are <0.5 mm in diameter. Larger vesicles confined to vesicle trains or erratically distributed.
 - Miaroles: Fine yellow-brown clay. Encrustations and red-brown globular lining (Fe-oxyhydroxides?) within vesicles in weathered zones and in some vesicle trains;
 - zeolites also occasionally present.
- COLOR: 10YR, 3/1, very dark gray to 10YR, 4/3, dark brown in Pieces 5 to 7.
- STRUCTURE: Massive.

ALTERATION: Slightly altered.

VEINS/FRACTURES: Some fragment surfaces have fine yellow-brown to brown coatings, suggesting that they fracture along very fine fractures.

ADDITIONAL COMMENTS: Piece 4 contains a glassy selvage. Piece 10 is very finegrained. Pieces 5 to 7 are more brownish in color due to slight alteration. Pieces 4 and 10 are finer grained than other fragments.

Fine scale vesicle trains

Glassy margin (piece 4)

Weathered zone (piece 9)



930

OBSERVER: KRI

ROCK NAME: Sparsely phyric clinopyroxene-plagioclase basalt

GRAIN SIZE: Fine grained

TEXTURE: Microcrystalline, vesicular

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPO- SITION		MORPHOLOGY	COMMENTS	
PHENOCRYSTS								
Plagioclase	1	1-2	0.3-0.7			euhedral	many are very corro	ded and have resorbed
							tendency towards gl	omeroporphyritic
Clinopyroyene	ă.	1	3			subbodyal	clusters of <5 grai	ns equant grains:
crinopyroxene	1	*				Subnedral	twinning and sector	zoning common
GROUNDMASS								
Plagioclase	20	20	<0.5			euhedral to	randomly oriented e	longate laths, some
						subhedral	zoned	
Clinopyroxene	7-10	7-10	<0.2			subhedral	mostly equant grain quench grains are p	s but some acicular, resent as well
Orthopyroxene	tr-1	tr-1	<0.1			subhedral	fresh, quench morph	ologies, identified
							by parallel extinct	ion and distinct
Manaakika	6 7	5.7	10.1				green-pink pleochro	ism.
Magnetite	5-7	5-7	<0.1			skeletal to eunedral	one region has high	density of equant
Olivine	tr	tr	<0.1			subhedral to	mostly present as s	mall, isolated grains
						anhedral	in the groundmass;	grains have higher
							clarity and higher	relief than other
							phases. Some grains	show some breakdown
							along cracks.	
SECONDARY		REPL	ACTNG/					
MINERALOGY	PERCENT	FILL	ING				COMMENTS	
yellow clays	1-2	replaci	.ng mesosta	sis		very rare and loc	alized replacement o	f mesostasis
VESICLES/			STZE					
CAVITIES	PERCENT	LOCATIO	ON (mm)		FILLI	NG	SHAPE	COMMENTS
Vesicles	15-20	through	nout <0.5		empty	porte.	rounded	a few larger vesicles
							subrounded	associated with "quench stringers"

COMMENTS: Extremely fresh, often glassy mesostasis makes upt 40-50 percent of this sample. There are three 0.5 mm wide elongate stringers of dark, quenched, highly vesicular material running across the entire slide. These are very similar in appearance to the filled vesicle globs of other sections except for their shape. Fresh glass is still present in these zones. Rock is extremely fresh. 880 point count (small section, excluding large crack in center) clinopyroxene groundmass 7.6%; plagioclase groundmass 18.9%; plagioclase phenocrysts 1.3%; clinopyroxene phenocrysts 0.4%; opaques 5.7%; mesostasis 50.4%; vesicles 15.2%. Rock is slightly altered.

135-837B-3R-01 (Piece 7,26-29 cm)

OBSERVER: LP WHERE SAMPLED: Unit 1

ROCK NAME: Sparsely to moderately phyric clinopyroxene-plagioclase basalt

GRAIN SIZE: Fine grained

TEXTURE: Porphyritic, vesicular

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAI	SIZE (mm)	COMPO- SITION	MOR	PHOLOGY	COMMENTS	
PHENOCRYSTS Plagioclase	2	2	1-1.2		subh	edral	some rounded margi	ns, zoned at rims;
							irregular glass in across in some cor clear or with subo inclusions; rare c rare embayments (r	clusions up to 0.1 mm es; other phenocrysts rdinate clinopyroxene? ruciform intergrowths, esorption?)
Clinopyroxene	1	1	0,6		subh anhe	edral to dral	fresh, tabular; so clays at rims; idi sections; rare sub with plagioclase t (glomerocrysts); t sections	me minor alteration to omorphic basal ophitic intergrowths ablets winning in basal
GROUNDMASS								
Plagioclase	10-15	15-18	0.1-0.15		blad lath	led, acicular		
Clinopyroxene	5-10	12	0.05		euhe	dral to		
Orthopyroxene	2	2	to 0.5		anhe	dral, granular	fresh laths	
Magnetite	4	4	to 0.35		subh	edral rhombs	microgranular magn groundmass in addi grains; some larger clustered and roun larger euhedral gr lathlike opaque (?	etite occurs in tion to the larger subhedral rhombs are ded skeletal grains; ains have inclusion of) 0.15 mm by
Mesostasis	20	25-30	n/a		inte	rstitial	0.1mm(possibly exs fresh and altered	olution?) glass
SECONDARY	DEDGENM	REPI	ACING/				COMPENSE	
Brown smectite	7-10	replaci	ng mesostasis	s/glass		brown smectite per	rvasive through mes	ostasis compared to
Red-brown smectite	5	replaci	ng mesostasis	s/glass		clots and patches coalesce and become	scattered through me dominant phase i	mesostasis; clots n finer grained to
Fe-stained clay	1-2	replaci	ng glass, inf	filling vesicles		glassy portion of	thin section; loca	ILY 60% OF FOCK
clays	2	prerere	entially alter	ring laminae		loxy red clays con	ncentrated in bands	
VESICLES/	지기 위해 아파 아파 파서	<u> </u>	SIZE					
CAVITIES	PERCENT	LOCATIO	N (mm)	FI	LLING		SHAPE	COMMENTS
Vesicles	5	through	lout 0.5	em	pty (see	notes)	subrounded	rare glass-filled, probably plucked; highly quenched vesicular glass filling; rims of quench fill have concentrated vesicles, cores have coalesced and irregualr voids
Vesicles	3-4	in lami	nae 0.1-0.15	5 em	pty		rounded, coalesced	localized in discrete laminae, spaced at
							to elongate	between 1-3 mm; laminae filled with glass altered to brown clays; the glass filling has elongate and coalesced vesicles
COMMENTS: Minor	plagiocl	ase alte	ration on rin	ns; locally pilo	taxitic	texture with align	ned plagioclase bla	des: continuous

MMENTS: Minor plagioclase alteration on rims; locally pilotaxitic texture with aligned plagioclase blades; continuous microvesicle tracts present throughout 50% of specimen spaced at 1-3 mm; spacing decreases to less than 0.5 mm towards the glassier portion (pillow margin/cooling margin); in hand specimen laminae have no vesicles/voids at <0.5 mm spacing but still marked by pervasive laminar fabric; plagioclase/clinopyroxene glomerocrysts are rare, grains more commonly are clustered near each other. 135-837B-4R-01 (Piece 10,58-60 cm)

OBSERVER: KRI

WHERE SAMPLED: Unit 1

ROCK NAME: Sparsely phyric plagioclase basalt

GRAIN SIZE: Fine grained

TEXTURE: Porphyritic

PRIMARY MINERALOGY	PERCENT PRESENT	PERCENT ORIGINAL	SIZE (mm)	COMPO- SITION	MORPHOLOGY	COMMENTS	
PHENOCRYSTS							
Plagioclase	1-2	1-2	0.5-1		euhedral	tabular isolated g sodic rims; melt i some are strongly	grains with narrow nclusions in many; zoned
Orthopyroxene	tr	tr	0.2-0.4		euhedral to subhedral	pale pink-green pl in small glomeropo with plagioclase	eochroism; isolated or orphyritic clusters
GROUNDMASS							
Plagioclase	30	30	<0.5		euhedral	randomly oriented sodic rims	microlites; some with
Clinopyroxene	7-10	7-10	<0.2		subhedral to	often occur in sma	11
-					anhedral	microglomeroporphy	ritic clusters
Orthopyroxene	3-5	3-5	0.1-0.2		subhedral	identification dif groundmass crystal clinopyroxene, whi euhedral grains ar	ficult but most of the lites appear to be le the more equant or e often orthopyroxene
Mesostasis	38	40	n/a		interstitial	mostly glassy and some minor breakdo plagioclase and cl crystallites	extremely fresh with wn; includes some inopyroxene
Magnetite	3-5	3-5	<0.8		equant to skeletal	rare ilmenite lame	llae in some
SECONDARY		REPI	ACTNG/				
MINERALOGY	PERCENT	FILL	ING			COMMENTS	
Yellow clays	1-2	replaci	ng mesosta	sis	rare breakdown o patches	f mesostasis to yell	ow-orange in isolated
VESICLES/			SIZE				
CAVITIES	PERCENT	LOCATIO	N (mm)		FILLING	SHAPE	COMMENTS
Vesicles	15-20	through	out <1mm		most are empty	subrounded	<pre>bimodal size distribution; large ones (>0.5 mm) are rare, while small (<0.2 mm) impart relatively high porosity to the rock; glassy selvages line</pre>

COMMENTS: Dark, quenched, highly vesicular, occasionally glassy material fills or lines some vesicles and fractures. Quench nmaterial in these is dominantly clinopyroxene crystallites with rare plagioclase. There doesn't appear to be any olivine in this section.

135-837B-5R-01 (Piece 8,60-69 cm)

OBSERVER: KRI

WHERE SAMPLED: Unit 1

ROCK NAME: Sparsely phyric clinopyroxene-plagioclase basalt

GRAIN SIZE: Fine grained

TEXTURE: Microcrystalline, vesicular

Vesicles	15-20	dissemi	nated	<3 mm	empty to completely fil	led subrounded	filled along alteration front (see below); some vesicles have thin
VESICLES/	PERCENT	LOCATIO	N	SIZE	FILING	SHADE	COMMENTS
					interiors		
clays	÷	****			filled with ligh	t yellow along edges to	o dark orange
MINERALOGY	PERCENT 1	FILL	ING		along alteration	front vesicles are par	rtially to completely
SECONDARY	0000000	REPL	ACING/			00100000	
						along fractures and	rims.
orrane	LT.	Ur	<0.1		anhedral to	and high relief; some	e show breakdown
Olivino			20.1		auchtendam 1 des	ilmenite lamellae	as with bigh playity
Magnetite	4-5	4-5	<0.1		euhedral-skeletal	large, equant grains	with very rare
						the groundmass; iden	tified by parallel
Orthopyroxene	tr-1	tr-1	<0.1		subhedral	fresh, quenched grain	n occur throughout
Clinopyroxene	7-10	7-10	<0.2		subhedral	mostly isolated equal	nt grains, some
Plagioclase	20	20	<0.6		euhedral	elongate laths, rand	omly oriented
GROUNDMASS							
						plagioclase; mostly laths; many are twin	equant but some ned
Clinopyroxene	tr-1	tr-1	0.3-1		subhedral-anhedral	tend to occur in sma	ll clusters with
PHENOCRYSTS Plagioclase	1-2	2-3	0.3-1		euhedral	some with melt inclu sodic rims	sions and distinct
MINERALOGY	PRESENT	ORIGINAL	(mm)	SITION	MORPHOLOGY	COMMENTS	

Extremely fresh, often glassy, interstitial mesostasis comprises 40-50 % of this sample. Alteration from crosses section, seen as "line" of infilled to partially filled vesicles with yellow to orange to brown the term of a site of the alteration from. amorphous material. Degree of alteration of the rock is the same on either side of the alteration front. Yellowish material has infiltrated the altered cores of the plagioclase grains. Small glomeroporphyritic clusters of plagioclase, clinopyroxene, and large equant magnetite. 1018 point count gives: Plagioclase phenocrysts 1.1%; Clinopyroxene phenocrysts 0.7%; Plagioclase groundmass 19.9%; Clinopyroxene groundmass 11.2%; Mesostasis 46.2%; Opaques 4.7%; Empty vesicles 13.6%; Filled vesicles 2.1%; Total vesicles 15.7%