- gloves
- wrap if not actively using
- slide toothpick flag in b/w foam & plastic so can reuse foam
- dirty tools in metal tray

measure on CT?
measure high CT # features?

CHIKYU Operation

No. 1

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 1 **Observer:** C. Ross **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	drilling disturbance	0	139											heavy drilling disturbance: - unoriented cm-sized chunks of mud - mm-cm opening mode cracks, horizontal orientation -
2	"	0	123											
3	"	0	29											
cc	"	0	23											
cc		4	6.5											gray ash layer (5-6 cm) darker, coarser grains @ base?
	CORE 2													
1	bedding	0	~50											bedding (steep dip) in CT, hard to see in core

CHIKYU Operation

No. 2

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 2 **Observer:** KS + AF **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	drilling disturbance	0	119.5											heavy drilling disturbance
2	bedding	30.1	32	90	15.4	0	18.7							CT scan bedding, light structure (36.5 PMAG rec)
	drilling disturbance	94.1	140.6											heavy drilling disturbance
3	bright planar feature	6.8	8.38	90	15.6	0	52.1							CT scan, bright planar feature, above Ash Seen in core on ⊥ to split plane. Confirmed 2nd app dip measurement.
	bright planar feature	61.3	63.2	270	16.8	180	64.3							CT scan, bright planar feature
	Bedding	68.4	68.5	90	2.2	180	34.5							CT scan, bedding (67 PMAG rec)
	Core 3 Night shift Y4 ~~ECR~~													
1														
cc	normal fault	6	14	000	23	270	50							CT scan
cc	bedding	2~~6~~	14	180	12	090	23							CT scan
3	bright planar feature	5	6	180	43	270	17							CT scan
3	bright planar feature	37	44	180	60	270	15							CT scan
3	bright planar feature	50	57	180	35	270	15							
3	AF Bright feature	3.4	13.5	90	34-37	180	85.6							Split by void. ⊥ view very hard to see plane

Drilling Breccia 0-34cm
Moderately fractured 34-66cm
Heavily fractured 66-80cm
Heavily fractured + Biscuit 80-112cm
80-96cm
Drilling Breccia 112-end (119cm)
JCORES

Core 2 section 3 JCORES
84.1-87.6
dipping plane in core visual and CT scan

New planes to try and measure in CT?

Core 2 section 3
93.3-95.6
very faint. worth measuring in CT?

Lithological black band seds entry 48cm
Section 1

CHIKYU Operation

No. 3

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 3 **Observer:** KS + AF **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	drilling disturbance	0	131											major drilling disturbance
3	bedding	106.2	107.5	270	11.8	180	30.6							CT scan, bedding, light structure (111 PMAG REC)

Add CORE 3 measurements to this sheet and mark out on 2 for clarity?

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 4 **Observer:** Alysa Feistel **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Heavy drilling disturbance	Full core												Heavily fractured 0-43cm Moderately disturbed 43-73cm Heavily fractured around chunk 79-89 cm Moderately disturbed 89-99cm Sec 1
2	Bright CT feature	23.4	27.7	270	35.4	0	39.3							Bright CT feature but not a continuous planar feature Possibly ash in rod but not really anything identifiable
														Planar bedding, seen in CT and VCD image. Noted in SCORES (by who?) but no measurements 60-62.1cm Sec 2

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 5 **Observer:** Alysa F + Kaitlin S **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Fracture	37.5	46	270	71	9	0							High angle fracture surrounded by drilling disturbed fragments
														5.8 - ~92cm High angle repeated fractures.
2	Bedding apparent	5	12.5	270	60									Bluish greenish linear feature. Fragmented surroundings. 2nd measurement not taken
	Fracture	8.5	17	270	53									Fracture consistent with bedding apparent features
	Bedding Apparent	22.5	29.5	270	60									Ashy or sandy (light colored) dipping planar feature (not fracture) within fragmented surroundings
	semi planar, striated surface	92	99											striated surface visible in core working ½ and archive
3	Bedding	44	47.5	90	33	0	60							Possible bedding. Very faint linear color difference. Inspection along outside of core liner notes light color and texture feature at same location. 2nd measurement very tenuous and taken from dip noted in outside core liner.
	Bedding (?)	47		90	03									sandy layer
	Dark seam			90	33	0	38							dark seam above sand and small ash bits

5-2, 23-29 sand layer
5-2, 4-11 ?? bluish/greenish
28-35 same orientation as sand, frac? bed?

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 6 **Observer:** Y. Yamamoto + C. Ross **Summary:** shallow bedding

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
3	bedding	28	28	90	2	0	3							
1	"	52	52	90	4	0	1							
2	bedding	72	74	90	18	crumbled								

2] 72-74cm
90/18
Is this flipped?
270/18

no drilling disturbance or core competence notes so based on low res VCD image

Also check seds team notes for anything on fractures

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 Site: C0019 Hole: J Core: 7 Observer: Y. Yamamoto + C. Ross Summary:

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	bedding	102	104	250	28	0	3							

No notes for sections 1 + 3
Should look at Seds
notes and higher res for
drilling distribance

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 8 **Observer:** KS, AF, HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Stiff clast	32	44											cut with the rock saw (cobble)
	dark seam/ bedding	10	15	270	38									Unable to see/identify in second plane
	Stiff clast - dark seam 1 (FAULT!)	35	36.25	270	15	0	08							First dark seam near top of clast, fault with truncated dark seam
	dark seam 2 (fault)	37	39	270	17	0	10							Second dark seam in clast, fault
	partial dark seam 3	37	43	270	52									3rd dark seam intersecting 2nd seam at 38cm
	Dark seam, truncated					0	48							
	dark seam 3	32	35	270	63	0	82							dark seam, truncated by fault
2	Stiff clast	44	46											1 mm wide stiff clast in the middle of the core section, Suspected pumice (pebble) green alteration beneath/around
	Dark seam	53.5	61	90	50									Dipping Dark seam clear in middle of core but not apparent at edges - check CT
	Thick dark seam	19.5	21	270	6									Half cm thick. Semi-oval dark feature beneath. Not apparant in second plane but fragmented and bad visual
3	Bedding	66.7	67.1	90	3	180	06							Subhorizontal bedding, possible edge disturbance due to core liner friction
	Bedding	95	103	90	53									Blue green and sandy above, Muddy below. Green clast at 99-100cm. 80mm wide ↳ continues into second plane as linear feature, direction uncertain
	Fault	115.2	119.5	90	23	0	4							Visible as dark seam/color contrast and possible offset of sandy/ashy plane below. Nicely seen on second plane. Near vertical
4 1	dark seam, truncated by fault					0	48							

Entered dark seam 1, dark seam 2, partial dark seam 3 w/ bdrn 0/82 and 0/48 measurements

Dark seam? Structure/Fault? \ Seds Bedding? \ Black Band?

No secondary measurement so put as bedding for now.

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 Site: C0019 Hole: J Core: ~~9~~ 9 and 10 Observer: Y. Yamamoto + C. Ross Summary:

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	bedding	92	94	270	37	0	58			56	105			No notes/descriptions check SCORES for the entries since I didnt see it for myself (Section 1)
2	bedding	42.5	44.5	90	35	0	63							
2	bedding	32	35	90	25	180	3							
2	bedding	64	65	90	3	180	4							
2	bedding	91	92	250	3	180	6							
	Core 10 x													
1	Normal FT	10	19	90	67	10	0			8	20			
~~1~~	~~bedding~~													
2										58	78			

towards sink = 180°

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** [redacted] 11 **Observer:** Y. Yamamoto + C. Ross **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]							
1	drilling disturbance	0	77											
✓ 2	fault	23	33	270	58	0	25			0	104			
✓ 2	bedding	57	66	90	40	180	38							defined by dark seams (n=2)
2	bedding	79	80	90	36	180	20							
✓	bedding	99.5	104.5	90	42	0	21							
2	bedding	7.5	32	90	28	0	28							Contact b/w coarser material on bottom & mud on top, dark seam b/w
✓ 2	fault	49	56	90	45	180	16							
✓ 3	bedding	28	33	270	31	0	12			0	96?			along lithologic boundary flame structure ↳ coarser sediments below
✓ 3	reverse fault	41.5	51	90	61	0	25							CT-scan verified, offset ~1cm (vert.)
✓ 3	bedding / fracture?	60	70	270	40	0	30							CT-scan verified
✓ 3	bedding	100	107	90	57	180	1							
3	bedding	58	59	270	9	0	1							biscuiting?, ash offset w/ coarser greener sand, flame structure
✓ 4	bedding	11	18	90	10	0	1			2	19			biscuit @ 19 & 56, dark seams
✓ 4	bedding	45	54	90	47	180	21			19	56			
✓ 4	bedding	59	60.5	270	13	0	9							green layers
✓ 4	bedding	78	78.5	90	8	180	17							litho/g.s. change
✓ 4	bedding	102	102.5	270	4	0	2							green layer
✓ 4	bedding	106.5	108.5	270	7	0	1							wavy dark seam
4	Normal faults microcracks	95	100	270										

7.5 - 32cm
28° dip??
Dont see this

Having trouble seeing offset. clasts aligned on either side of fracture

Are these switched?
59-60.5 green layer
78-78.5 g.s. change

Noted normal faults/cracks from SCORES
Flame apparent structure above it

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 11 + 12 **Observer:** Y. Yamamoto + C. Ross **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
✓ 5	bedding	8	26	90	26	0	16			0	86			-Some beds offset by minor microfaults w/ offset <1 mm
✓ 5	normal fault	25	35	90	59	180	44							-verified in CT, offset 5cm (vert), microfractures splay from normal fault
✓ 5	microfaults	38	65	not	measured									-dominated by normal faults, offsets <1mm, beds ~2cm defined by green layers {dark seams, too small to measure w/o destroying
✓ 5	bedding	62	66	90	26	0	14							-representative bedding, frame structure b/w coarse darker sediments below @ 66 cm
✓ 5	bedding	97	98	90	2	0	4							-ash-mud contact
✓ CC	drill. disturb.	0	10											drilling disturb. -> biscuiting yellow tuffaceous
✓	normal fault	11	17	90	46	0	30							erosional truncation by dark seam @ 10cm?, measured in CT offset 4cm (vert.)
CORE 12														
1	~~breccia~~ deformed ~~burrow~~ pumice	44.5	49	270	20	not measured				0	65			~~measure~~ in CT? no continuous elongate clasts (dark seams)
1	bedding/ burrow?	15	17	270	10	6	2			65 77 87	77 87 124			
2	burrow/bioturb	0	82	not	measured									
2	bedding	84	84	270	6	180	2			0	97			
2	bedding	103	104	270	15	180	12			97	107			
2	bedding	110	110.5	90	3	0	4			107	121			
3	drilling fractures	19	127											drilling mud (CT darker, void) @ top? maybe not -green spot heavily fractured w/mud orientation, spacing, breccia ~~or~~ not drilling interp - ujie-san breccia ~77 cm
														if goes to intact ask Masao - for age reversal

(HW) Hanging wall

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 12 **Observer:** KS + AF + HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	normal fault	83	97	90	68	344	0			0	97			~1cm normal fault
2	Ash	87	90											unstructured ash that may be disturbed by fault below
2	fault	50	63	90	64	39	0							fault cuts bioturbation on the HW, normal fault, striation rake parallel to fault plane.
3	Bedding/burrow	1	1	90	03	180	25			0	36.5			Burrow on 270 edge
	Bedding	2	2	270	01									destroyed 2nd when cutting
	fault (normal)	19	36.5	270	71	20	0			36.5	74			~1cm offset normal fault, through ash layer
	fracture zone	30	71	270	38	0	0							zone is fractured from 30 → 71 with 1½ – 2cm spacing and general orientation of 270/38 on the core face.
	Ash boundary	71.5	71.5	90	01	180	07							really soft ash below mudstone, possibly disturbed by drilling
	Ash boundary bottom	71.5	76	90	36	336	0			74	104			possible fault
	Brecciated fracture zone	74	81	90	38									¼ – 1cm fractured pieces with 90/38 preffered orientation, darker than above / below
	fracture zone	81	100	270	44									1½ – 3cm fractured blocks w/ 270/44 orientation.
	? moderate fracture zone	104	127	270	9-14					104	127			
	fracture	6	15	270	63	299	0							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 12 **Observer:** KS + AF + HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
4	fault	17	22	270	43	180	23			0	103			color contrast accross, polished face, fell apart
	fault	23	31	270	55									
	fault	34	46	270	65	0	48							→ clear in archive 1/2
	Brecciated/ Fracture interval	58	80											1/2 cm 58-69, elongated, fractured pieces that are ~2-3 cm long, 69-80 is smaller, rounder fractured pieces ~1/2 cm. no preferred orientation
	fault	78	82	90	31	0	24							→ Brecciated on top (HW), competant and light color on FW
	fault	90	102	90	58	295	0	4	90					
5	Bedding	33	37	90	35					0	136			
	bedding	75.5	79	90	34									
	bedding	76.5	80.5	90	37	0	10							
	fault	87	93	270	47	180	~~30~~ 30							At least 9mm disp. fault with dark gouge, normal
	bedding	96.5	101	90	38									
	fault	96	98	90	15	0	47	47	90					green bedding truncated
	fault	103	104	270	08	180	44	79	90					
	Block	118	122											dark layered block, draped by dark seds, maybe transport deposit from 103 – 122 laminated
OC	fault	0	6	90	69	4	0							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 13 **Observer:** KS + AF + HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	Bedding	38	40	270	21	180	15			0	40			curved @ edges. Ash/pumice clasts terminate @ boundary.
3	Bedding	47	48	90	08	0	06			17	61			
	Bedding	55.5	56.5	90	10									
	black seams	25	46											zone of micro black seams with micro offsets
2	black seam	73	89	90	20	270	36			40	102			
										29	38			
1	fault	0	20	90	60	90	29	40	290	0	20			curved and more vertical below 8cm
	bedding	80	83	90	35	57	25			20	64			

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 14 **Observer:** YY + C. Ross **Summary:**

	Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
					az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
14	1	fractured zone	27	35	270	31	0	43			27	84			5cm zone, 2 large fractures, ~1cm spacing fractures, measured orientation @ 31-35cm
	1	bedding	29	33	90	39	0	20							bioturbated
	1	fracture zone	70	84	270	16									size: 1cm x 0.5-2cm clasts, thickness: 15cm, measured below @ 80-81cm spacing: ~2cm horiz,
	1	fault	76	82	90	50	180	33							
	1	fractured zone	84	102	subhoriz		sub-vert								size: 1 x 1.5cm clasts, average 0.1-0.1cm thickness: 17cm, too fragmented to measure, spacing: horiz: .5cm-3cm, avg 1cm, vert: ~1.5cm
	1	fractured zone	44 measured: 49	70 ≈9	270	75	0	29							size: 2x10cm, thickness: 35cm, spacing: 1-2.5cm, 4 large, high-angle fractures
	1	fracture	80	81	270	13	180	1							
	2	fractured zone	16	31											size: 2x2.5cm clasts, thickness: 15cm, 1-2cm spacing, measured orientation @ 18-20cm
	2	fracture	18	20	270	29	180	1							
	2	fractured zone	31	54											size: 2x1cm largest, smallest: 0.1x0.1cm, thickness: 13cm, similar orientation to fractures above + antithetic fractures, spacing 0.5cm
	2	bedding/bottom	60	61	270	18	180	21							
	2	fault	61	70	90	56	180	15							
	2	bedding/contact	60	70	90	43	180	21							top & bottom orangey (ashy?) sub-parallel 3cm wide, folded & wavy
	2	fault gouge	72.5	77.5	90	23	180	8							clasts of brown mud inside, foliated
	2	ash bedding	93	96	top 90	18	0	29							check on archive half for sigmoidal structures - ash melting?
	2	triangular cataclasitic ash-bedding?	98	101	bottom 270	25	0	20							biscuit @ 82.5cm?
	cc	crumbled fragments													

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 15 **Observer:** Y. Yamamoto + C. Ross **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	fractured zone (light) ↑	0	41											Subhorizontal fractures → potential drilling rotation? size fragments: 5.5cm x 2cm, thickness: 41cm, spacing: 1-5cm
1	representative fracture	48	49	270	2	0	22							
1	fractured zone	41	131.5											high angle fractures, size: ~3x9cm, thickness: 90cm, spacing: n=20 ~3cm (some as low as 1cm)
1	representative ↑ fracture	57.5	61.5	270	65	180	16			49	126			
1	bedding	94	97	90	36	0	30							
1	normal fault	96	105	270	57	180	16							
1	fault	108.5	119	270	60	180	7							
2	moderately fractured zone	0	23											frag. size: 3x4 cm, thickness: 23cm, spacing: irregular 1-4cm, no pref. orient.
	intensely fractured zone-breccia	23	35											frag. size: .1x.1cm up to 3x1cm, thickness: 12cm, spacing: 1cm, 270/41 pref. orient
	variably fractured (moderately & weakly)	50	75											frag size: 0.5x0.5cm up to 3.5x2.5cm, thickness: 2 zones 10cm each w/ ↑ # of fractures, 2 sets: 090/28 & 090/74, spacing: 2.5cm max, 0.2cm min.
	weakly fractured	75	98											size: 3x12cm, thickness: 20cm, spacing: 4.5cm
	thinest fault	116	120	90	21	0	31	51	90					no pref. orient → radial structure
3	moderately fractured zone	28	56							31	84			frag size: 1cm x 8cm, thickness: 28cm, spacing: regular ≥ 1cm, same orientation as 72-77cm
	mod. frac	56	72	270	42	180	29							frag. size: 1.5x2cm, thickness: 20cm, conjugate fracture set starts in addition to one described above & below
	mod. frac representative frac →	72	85	90	54	0	23							back to orientation & frag size similar to 28-56cm interval
	heavily fractured zone/breccia	85	131							84	104			high angle fractures still pervasive now w/ horizontal fractures
	bedding	93	97	90	26	180	7							
														coarser grains, split surface was not clear, spacing of horiz. frac. ~0.5cm, frag: 2x0.5cm elongate sub horiz clasts thickness: 132 cm

Don't see the 72-77 interval fracture one at 77-83 cm that I've assigned this to

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0014 **Hole:** J **Core:** 15 **Observer:** Y. Yamamoto + C. Ross **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
4	bedding	5	12	270	30	180	12							
4	heavily fractured	12	38											size: 0.5x0.5cm, horizontal frac + 45° conjugate sets, spacing ~0.5cm
4	fractured zone crosscut intact material	43	57											drilling breccia? likely real - similar orientation to other fractures, curved frac → drilling?
4	heavily fractured along color change → bedding?	71	79											size: .1x1.5cm, dominant frac + horiz frac. thickness: 2cm spacing: 1cm for both orientations
4	bedding	97	97	90	2	0	47							
	mod. frac.	78 85	114 85	270	41	180	29							dominant fracture orientation in this section
	heavily frac	115	128											dominant frac orientation + conjugate set (90/45), size: 1x1cm thickness ~7cm ⊥ to fault surface above (end of core)
	fault w/ clay gouge?	114	125	270	60	180	30							
5	fractured mod. reg. frac.	0 28	47 33	sets 270	39	180	52			0	88			size: variable .3x.2cm upto 4.5x2cm, spacing of high angle frac .1-4cm - mainly 1cm, conjugate set (#3)
	breccias around coherent clasts	47	88	set1 90	39	0	20							
				set2 90	89	10	31							
	bedding	105	110	270	37	180	30							
	small breccia zones (not pervasive)	88	102											drilling induced?
cc	drilling disturbed breccia													

85-85cm? or 85-95cm? I see something in this interval

90/89 and 90/31 ?

CHIKYU Operation

No. 1

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 16 **Observer:** Y. Yamamoto + C. Ross **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip az.	Core face app. Dip dip	2nd app. Dip az.	2nd app. Dip dip	Striation on surface rake (≦90)	Striation on surface from (±1, 90 or 270)	Coherent interval (for P-mag) top	Coherent interval (for P-mag) bottom	P-mag pole az.	P-mag pole dip	Note
1	bedding	28	32	90	36	335	0			26	33			
2	N. Fault (small)	10	11	90	80					3	12			
4	bedding	8	11	90	22	180	3			4	4			
4	〃	19	21	90	23	180	12			12	23?			
4	〃	34	36	90	25	180	16			23	26			
4	〃	39	41	90	26	180	20							
4	〃	48	50	90	23	180	23							
		~~61~~	~~64~~											
4	〃	76	79	90	29	180	21							
4	〃	79	81	90	20	180	24							
4	Normal Ft	91	105	250	84	22	0							5mm offset
4	bedding	90	92	90	16	180	24							
4	fracture zone	105	126	250	15	0	18	← preferred orientation						2cm fragment (length) aspect ratio : 3~4
3	〃	0	5											~0.5cm fragment (distub?) aspect ratio 1:2.
4	〃	5	18	90	25	180	24			0	49			2cm fragment aspect ratio 2~3
4	Fault	10	20	90	55	33	0							
4	MTD(?) flow	35	40	90	25									
4	Fault	55	64	90	63	317	0			49	50			

Is this a structure we input?
← unsure where to find

CHIKYU Operation

No. 2

Structural Geology Observation Sheet

Exp.: 405 Site: C0019 Hole: J Core: 16 Observer: Yazumi, CR Summary:

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
3	Fault	81	91	90	54	40	0			55	126			
〃	R. Fault	91	98	90	49	—	—			↓	↓			
〃	bedding	95	98	250	12	0	3			↓	↓			
〃	〃	117	119	250	17	0	0			↓	↓			
4	N. Fault	8	14	90	44	20	0			5	32			
〃	〃	8	30	90	80	—	—			〃	〃			
〃	bedding	28	29	250	6	0	11			〃	〃			JCORES Section 4 VCD and CT 38-46 Normal Fault? Offset bedding/clast
〃	〃	40	41	250	10	0	15			35	65			
〃	〃	53	53	90	2	0	0			↓	↓			
〃	N. Fault (small)	59	59	250	30	—	—			↓	↓			
〃	〃	60	62	90	32	—	—							Moved to ← 57-62 cm N. fault 90/32

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 17 + 18 **Observer:** Y. Yamamoto + C. Ross **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	highly fractured	0	20	90	14	0	52			21	28			size: 5 x 2.5cm, thickness: 8cm, top of core disturbed
1	bedding	23 16	25 17	90	18	180	12							spacing: 1cm
2	thrust fault	54	61	90	50	0	46							2.5 cm offset of ash layer
2	incoherent layers	41	35											ash or sandy lens? drilling mud?
2	fracture zone →	75	76	270	49	0	40							
		71	82											
2	bedding	68	70	270	17	180	14							
cc	microfaults (normal)	8	10											could be drilling induced
	wavy bedding	14.5	17	drilling disturb. did not measure										below clay ashy layer
	CORE 18									93 - biscuit?				
1	bedding	7	10											most consistent bedding
		31	33											
		44	47											
		61.5	64.5											
		106	108											

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 18 **Observer:** KS + AF + HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Bedding	2.5	5	90	26	180	08			0	129			
		7	9	90	25	0	6							
		11.5	14	90	25	0	0							
		17.5	20	90	26									
		30	33	90	24	0	4							
	fractures interval	34	119											fractures spaced ~3cm apart (sometimes 5cm) with a preffered orientation of ~90/22 on the face. Some are more sub horizontal at ~90/10. Fractures are nearly parallel to bedding
		42.5	44	90	16	0	0							
		46	49	90	28	0	6							
		77.5	78.5	90	17	0	0							
		109.5	111.5	90	18	0	10							
	fracture	9	17.5	90	49	0	44							truncates next fracture from 18-26
	fracture	18	26	270	57	292	0							
	bedding	43.5	46.5	90	29	0	11							
	"	61.5	64.5	90	27	0	9							
	"	70.5	74	90	30	0	10							
	fracture	81	95	270	72	308	0							
	fracture	95.5	106	270	60	328	0							
	Bedding	106	107.5	90	16	0	11							
	Bedding	107.5	109	90	16	0	12							
	bedding	112.5	115	90	25	0	5							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 18 **Observer:** KS & AF & HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2										30	139			
	Bedding	41	43	90	22	0	9							
	Bedding	61	62	90	08	0	11							
	"	67	68	90	10	0	9							
	Fracture	56	75	270	78	351	0							Bedding is not visibly offset
	fracture	74	83	90	61	330	0							
	Bedding	88	89	90	10	0	5							
	"	90.5	92	90	15	0	6							
	"	95	97	90	17	0	12							
	"	101	103	90	15	0	15							
	fracture	83	96	270	74	314	0							
	fracture	95	102	90	60	0	57							
	Bedding	114.5	116	90	20	0	11							
	"	119	121	90	17	0	14							
	fracture	114	125	270	65	310	0							
	fracture	125.5	127.5	90	18	0	10							TOP lighter brown, faint faccoid layer ~3mm thick, Bottom could be sheared but unable to get sense., foliation on face similar to fracture pattern
	fracture	128.5	130.5	90	21	0	14							
	Bedding	131	132	90	14	0	23							
	fracture	134	137	90	27	0	2							
	Bedding	136.5	138	90	13	0	9							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 18 **Observer:** KS + AF + HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	fracture	102	104	90	20	180	66							~~Many~~ high angle fractures that look like pieces spalling off, surface is shiny
	fracture	118	122	90	42	180	75							
3	Bedding	18.5	20.5	90	20	0	5			0	78			
		22.5	25	90	21	0	4							
	fracture	16	16.25	90	3	0	69							
	fracture	25	40	90	76	293	0							between conjugates
	fracture	25	30	90	33	0	70							conjugates
	"	37	40	90	28	180	72							"
	Bedding	40.5	42.5	90	20	0	10							
	fracture	36	41	90	36	0	66							
	fracture	43	73	90	68	30	0							curves from 90/68 to 90/72
	Bedding	60	61	90	13	0	0			73	140			
	Bedding	66	66.25	270	03									
	Bedding	73	77.5	270	44	0	32							
	fracture	87	87	90	2	180	32							
	Bedding	90.5	96	270	47	0	26							
	fracture interval	87	105											1/2 cm thick ~ 87 and increased size to 1 cm @ 105
	curved feature	108	112											

90/19 and 270/25-30 prefered orientation on face
maybe biscuit bottom?

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** **Hole:** C0019J **Core:** 18 **Observer:** KS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
3	fractured interval	105	130											2-4½ cm blocks, no preffered fracture orientation
	bedding	134	137.5	270	38	180	08							
4	fracture	13.5	16.5	270	26	180	30			4	18			
	fracture	16.	19.5	270	33	180	55							
	fracture	16	35.5	270	75	17	0							fracture from 28 → 44 and 19 → 25 intersect main fracture w/ high angle dip to 270 but variable/wavy on face
4	minor fracture zone	45	98							44	99			1½ – 5cm blocks w/ avg orientation of 90/60
		49	53.5	90	46	180	33							
		70	79	90	52	180	54							
		77	85	90	48	180	53							
	bedding	46	50	90	39	180	10							sandy below green layer, sandy layer has undulating base ~61-66, w/ face orientation roughly 90/42
	"	58.5	63.5	90	45	0	32							
	"	67	70	90	32	0	17							
	"	70	75.5	90	60	0	22							
	fracture top	90	95.5	90	44	0	0							1.5 cm thick layer w/ fabric in the middle and bottom, bounded on top/bottom by fractures
	fracture bottom	93	98	90	44	0	0							

85 → fracture top

soft seds deformation?

fracture 99.5 107 270 50 328 0

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 18 **Observer:** KS + AF + HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
5	bedding	16.5	18	90	11	180	1			16	40			
	"	21.5	25	90	32	0	2							
	fracture	26	37	270	65	333	0							
	fault	41	43.5	90	24	0	5							Ash on HW is cut on bottom by fault
	normal fault	44	56	90	59	305	0							1cm offset
	partial bedding	48	51	90	25	0	9							offset by fault, same orientation on FW
6	fracture	0	9	90	62	315	0			17	40			
	Top of Ash	11.5	12.5	270	08									(called this bedding)
	Bottom Ash	16	17	270	12	0	13							
	~~Thrust fault~~	17	30	270	69	0	0							½cm disp of bedding, possible disp due to drilling disturbance
	drilling " induced fracture	22	36.5	270	65	0	0							~1cm disp of bedding, possible drilling disturbance. offsets ash
	bedding	21.5	23.5	270	20	0	11							
	"	20	22.5	270	20	0	13							
	"	40	42.5	270	25	0	7							Top of sand layer
	"	41.5	44.5	270	27	0	8			51	80			bottom sand
	Thrust fault	43.5	50.5	90	49	287	0							½ cm disp
	normal fault	40	49	270	58	25	0							1½ cm disp
	fault	48	62	90	50	346	0							
	bedding	57	59	270	15	0	7							
Co	High drilling disturbance													

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 18 **Observer:** KS + AF + HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
6	Bedding	71	72	270	07	0	2							
	Top of faint biscuit	65												

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 19 **Observer:** Alysa F **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Bedding	17	20.5	90	26	180	8							A bit wavy
	Bedding	28	30	270	8									greenish feature slightly dipping opposite, potential biscuiting above
	" "	31	33.5	90	18									Sandier w/ some burrows/bioturbation below
	" "	51	54	90	20									greenish/bluish linear slightly dipping bedding planes
	" "	55	57	90	90-66 24	0	37							
	" "	59	61	90	18									
	Dark seam	64	66	90	21									greenish layers in between, not offset or truncated
	" "	71.5	74	90	20	0	23							
	Biscuit	24	230?											rounded fragment and bedding plane in below clast is oriented differently
	Fracture	40	40	270	4	180	10-25							Higher angle in 2nd plane on 90° side. curved plane
	Fracture	45	46	270	2	180	35							
	Fracture	66	67	90	5	0	61	90	270					Striations
				preferred orientation										
	Fracture zones	23	30	270	<5	180	<10							Biscuit to horizontal and sub horizontal
		39	45											Not dipping in core face, 220 dip in 2nd plane (2nd plane) Also between 40 and 45 fractures is 90/70 270/4 (core face)
		45	65											Steeper plane/fracture, different dip (chunk)
		65	70											Back to horizontal

Sec 2 fracture 96 86 90 57 270 0 +31

NO offset 86 90 4 ~180 ~15

Sec 3 47-50 90 26 0

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 19 **Observer:** AF **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	Bedding	11	11.5	90	15									Dark seam or bioturbation
		17	19	90	18									Sharp grain size contrast Sandy to muddy
		19	20.1	90	18	180	10							Dark seam
		31	33	90	20									Greenish band/layers
		42	44.5	90	14	180	15							Greenish band cut by two fractures but not offset
		35	37	90	28									wavy sandy contact
	Planar repeated Bedding	75	90	90	0-3									Bedding planes, parallel to each other on core face. Green brown alternating. Cut by high angle fracture, no offset
		86	86 example	90	2	180	17							
	Faulted Bedding (see Fault)	54	57	90										Disturbed/offset by Fault motion Greenish bedding layer
	Fracture	13	16.5	90	30	0	34							
		22	29	90	42	180	12							
		39	49.5	90	56	0	62	270 or 0	0-9					
	N Fault	52.5	60	90	46	0	90-37 58	20	90					Striations apparent on both of these fracture faces
	N Fault	60	65.5	90	51	0	9	20	90					in same direction
	Fract	38	46	270	50	0	64							bottom fracture has offset green seam
	Fract	71.5	76.5	270	38	0	55							No offset cuts across bedding
	Fract	76	86	90	57	301	0							No offset, cuts across bedding
	Fract zones	7	22											No offset cuts across bedding
		40	65											same orientation 3 fracs from 12-19cm 1 or 2 from 7-12cm Conjugate sets? Normal faults
		71	86											Conjugate no offset

Top fracture has offset bedding above plane/core face

CHIKYU Operation

No.

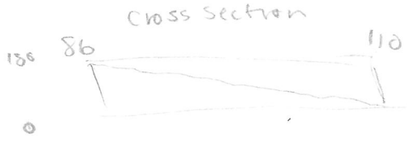
Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 19 **Observer:** AF **Summary:**

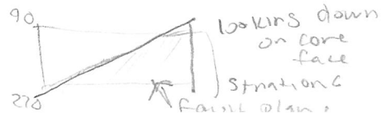
Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip az.	Core face app. Dip dip	2nd app. Dip az.	2nd app. Dip dip	Striation on surface rake (≦90)	Striation on surface from (±1, 90 or 270)	Coherent interval (for P-mag) top	Coherent interval (for P-mag) bottom	P-mag pole az.	P-mag pole dip	Note
3	Beddings	1	3	270	27									Sandy bioturbation
		2	4											
		8	10	270	25									
		13	16	270	25	180	11							Brown finer band than sandy surroundings
		28	32	270	28	180	18							Greenish band, cut by frac - not offset
		↓	↓											Greenish/black band. very fragmented, not offset
		35	40		29	180	10							Continues, still not offset within fracs
	possible bedding	42	46	270	32	Too fragmented to measure								offset nearer to 270 side, normal fault offset ~1cm
		56	57	270	18									Bedding offset. ~2cm, normal fault
		97	98	90	5									Greenish wavy band
		102	105	90	25									dark seam/color change
		106	107	270	11	0	16							bioturbation? wavy dark seam under clasty/pumice. Not clear 2nd measurement on a broken plane
	Fract zone	1	23	horizontal, 2 at this				2						Minimal fractures
		16	19	90	34	180	26	30	270					Striated surface
	Frac zone	22	40	~90	~60	← preferred orientation		Starting at bottom of				270/30		fracture
	Frac zone	38	74	~90	~45									
						~~measure in~~								Highly fragmented but all similar orientation
	N fault	42	47	90	46									→ Normal fault, offsetting greenish dark bedding
	N fault	53	61	90	49									→ Normal fault offsetting dark bedding
	fault	66	72	90	45									→ No visible offset but similar angle/disaggregation as other faults
	Frac Zone	74	106	90	30-40									
	High angle Fault	86	96	90	58	294	0							

Striations roughly parallel 90-270 direction/plane and 290/40 on core face for direction

Cross section



Very shallow/throughgoing feature
plane is seen all the way to
110cm



CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** **Hole:** **Core:** 19K **Observer:** HS, AF, KS **Summary:** No bedding observed, slumpy structure, few fractures

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
4	fracture	8	38	90	83	312	0			0	110			
	fracture	38	42	290	30	180	50	46	90					with striation
	~~fault~~ fracture	101	103	90	12	0	47	46	90					very sharp fracture w/ striation

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 19 **Observer:** KS + AF + HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
5	fracture interval	0	54							0	111			2 - 5 cm blocks seperated by fractures w/ predominant orientation of 90/50 with occasional sub horizontal fractures on face to 270 direction
		15.5	29	90	64	0	27							
		20	23.5	90	30	0	59							
		28.5	30	270	23	0	69							
		27	35	90	54	0	62							
	sharp contact/ dark seams	54.5	62	90	51	0	53							dark material overlying 5cm thick lighter layer with ash in middle
		62.5	71	90	50	0	57							3mm thick dark band on bottom of ash layer/light stuff
	Bedding	106	109	270	31	180	23							
		108	110.5	270	30	180	20							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 20K **Observer:** HS, AF, KS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	heavily fractured zone	0	~~22~~ 19							0	19			fragment size 1mm ~ 3cm, fragments have striated surfaces may be protobreccia disturbed by drilling.
	drilling fractures	22	35							19	35			fragment size 1–5 cm
	fracture zone	35	52	90	0	180	23	—	—	35	98			fragment size 3mm~2cm
	heavily ~~fract~~ frac. set	52	63	[illegible]	[illegible]	—	—	—	—	—	—			spacing 2mm~2cm, some are striated
	frac zone	63	92	270	35	180	50							
	bedding	110	119	90	26	180	12			98	119			
	coarser sand bed	96	101	90	42	180	50							90~99 coarsers, sand or ash?
2	fault	76	85							23	140			offset within cm-scale soft sediment deformation (slump?)
	moderately fracture zone	23	74											curved beds within, sharp-cut bed indicating offset
	fracture	60	65	270	49	0	20							
	fracture	73	77	270	45	180	58							
	bed	113	118	270	38	180	27							
	bed	130	133	270	12	180	15							green altered ash bedding
	fracture set	87	139	270	38	180	27							bed parallel fractures, 1–8 cm spacing

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 20 **Observer:** KS + AF + HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
3	Bedding	88	92.5	270	44	0	4			0	45			
		83.5	88.5	270	41	0	3							
	Bedding	2	4.5	270	23	180	07							
	"	19	21	270	18	180	11							
	Blocky/Fractured area	0	45											3-4cm blocks bounded by fractures with no preferred orientation
	drilling disturbance	41	53											2 biscuits in drilling mud
	Bottom of drilling disturbance	53.5	53.5							54	110			
	lithologic boundary	55.5	64	270	50	330	0							
	bedding	70	74	270	26	0	2							
	ASH	100	105											
	fracture interval	60	94											sub parallel to bedding
	fracture	67.5	70	270	26	0	6							general orientation 270/25 with 2-5cm spacing.
	fracture	64	67	270	24	0	8							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 20 **Observer:** KS + AF + HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note			
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip				
cc	drilling disturbance																
4	Fracture	2	7.5	270	45	309	0			0	66						
	Bedding	20	23.5	270	28	0	22							white in CT			
	"	22	25.5	270	29	0	19										
	"	34.5	38.5	270	32	180	15										
	"	36.5	40.5	270	33	180	16										
	"	42.5	47.5	270	46	180	15										
	fracture	42.5	47.5	270	46	180	49							Fracture along bedding ~~plane~~	strike		
	fracture	47	57	~~270~~ 270	~~87~~ 57									no clear orientation in CT			

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 21 **Observer:** KS + CR **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	bedding	11.5	12.5	90	04	0	6			0	26			
	"	17	17.5	90	03	0	13							
										36	84			
	BISQUIT?	31	36											
					11									
	Bedding	37	38.5	270	16	0	17							
	"	59.5	61.5	270	20	0	11							
	fracture/fault	64	75	90	51	180	53							
2	fracture	0	11	90	89	180	2			17	83			pumice-filled - changes orientation
		11	20	270	27	180	15							
	"	34	41	270	29	0	59							dominant frac. orientation in section
	bedding	41	44.5	270	26	0	4							
	"	51	54.5	270	27	0	19							
	biscuit	82	86											
	bedding	86	88	270	23	0	1							along ashy wavy layer
3	fracture	27	35	270	55	180	15			26	107			dominant fracture set
	"	56	56	90	19	0	14							set 2
	fracture	68	67	270	97	0	48							dominant + set 2, along wavy ashy layer
	"	86	93	270	70	0	22							" "
4	fault	1	8	270	81	180	55							
	fractured zone - rep fract.	4	26											size: 0.3 x 0.5 cm fragments thickness: 1cm, spacing: 0.5cm
		12	17	90	50	0	46							
	fractured zone	40	69											grades from less → more damage down core, size @ top = 3x2cm size @ bottom = .1x1 cm thickness = 20cm, spacing @ top = 3cm spacing @ base = 0.1cm
	representative fract 1	52	46	270	44	0	20							
	" " 2	64	67	90	25	0	60							small breccia fragments along some fractures

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 21K **Observer:** CR **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
5	fault	4	35	270	5	0	64			31	58			strange curved shape → drilling induced?
	bedding	15.5	18	90	30	0	4			6	25			
	fault	27	36	90	60	6	8							
	bedding	32	36	270	40	180	11							
	fracture	40.5	45.5	90	51	180	9							dominant fracture orientation + conjugate set
	bedding	61	63	90	40	—	—							← same orientation
	fault	60	67	270	49	180	36							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 Site: C0019 Hole: J Core: 22K Observer: YY CR Summary:

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Fracture	19	40	250	55	12	0			23	43			
〃	bedding	98	100	250	22	0	21			80	104			
2	N. Fault.	0	8							0	55			
〃	bedding	2	4	90	26									
〃	(MTD?) ~~Flow det.~~	12	20											Flow det.
〃	Weak fracture zone	5	19											spacing 0.5cm, aspect ratio 5~?
6	bedding	4	4	250	4	0	2			0	58			
6	fracture zone	8	24											*2cm fragment (length) aspect ratio 1~2 No striation. No preferred orientation
〃	〃 (smaller fragments)	24	29											*0.5cm fragments aspect ratio 1~2 No striation
〃	bedding	50	51	250	4	0	32							
〃	〃	41	41	250	2	0	26							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** U **Core:** 22 **Observer:** YY+CR **Summary:**

note: out of order sections

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
4	bedding	15	16	270	26	180	27			0	38			
"	fault	23	38	90	72	180	5			79	88			
"	fractured zone	46	73	90	27	0	50							size: variable, commonly .5cm x 1cm from 29-39cm, larger (2x2.5cm) 40cm - 73cm, radial fracture @ edge of core liner (drilling-induced?) @ 64cm, spacing (29-39cm) - 1 - .5cm, bottom (40-73cm) irregular
"	representative fracture	42	44											
"	bedding	84	84	90	0	0	15							
3	bedding	5	19	90	17	0	11			34	103			
"	fractured zone breccia?	17	43	top 90 bottom 90	20	0	13			103	111			size: 0.1cm x 1cm, thickness = 22cm, spacing ~ 0.1cm, chaotic
"	bedding	44	45	90	79	180	34			115	140			
"	fracture	62	67	90	17	0	15							
"	"	102	92	270	42	0	45							conjugate set
"	bedding	123	125	270	63	180	30							" "
					1	180	11							
5	bedding	26	27	90	8	0	9			0	83			
"	fractured interval	48	60											top → fault (wispy) bounded, sub vertical + sub horizontal fractures. frag. size = .6 x .6cm, thickness: 10cm, spacing: 0.6cm
"	bedding	62	63	90	5	180	34							
"	fractured interval	77	92											
"	representative fracture	72	78	90	37	180	45							size: .6 x 1 cm, smaller fragments from 83 → bottom, top 1x4cm (72-83cm) spacing:

25 — 33

Grac

90 34 180 21

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 23 **Observer:** YY+CR, +KS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	heavily fractured													drilling disturb? drilling breccia @ base
2	bedding	14.5	15.5	90	3	0	17			12	44			
	"	38.5	40.5	90	16	0	13			50	77			
	fault	25	31	270	40	0	13							
	fracture	69	74	90	36	180	11							dominant fracture set
	heavily fractured	77	107											dominant set + sub horizontal fractures size: 1 x 0.5m thickness: 30cm, spacing = 0.5cm
3	Bedding	34	35	270	09	0	12			0	56			
	heavily fractured ~~cutting~~	56	93											drilling disturbance, 73 ~ 83 drilling mud/ash, 73-77 is ash in CT
	dark seam	93.5	96	90	12	0	8			96	140			truncated by drilling disturbance
	normal fault	124	129	270	40	0	9							
	bedding	128	129.5	90	10	0	7							
	dark seam	130.5	139	90	50	0	11							
		83	93											> spiral fold thing? drilling!

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 24 **Observer:** KS + AF + HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Bedding	35.5	36	90	2	0	11			0	52			
	"	41.5	42	90	3	0	10							
2	Bedding	6.5	7	270	4	180	03			0	21			
	fracture interval	23	31											1-3cm spacing of fractures w/ 270/ orientation
		27	30	270	28	180	50							
		28	31.5	270	31	180	49							
	Highly drilling disturbed	31	72											drilling mud, very soft (45-55 BISQUIT) (55-70 BISQUIT with bedding within.) (possible bottom of turbidite seq.)
	litho contact	72	72	90	0	0	0							intact below, drilling disturbed gradation sequence above
	fracture	74	84.5	270	70	33	0			73	107			
	Bisquit	87	93											
	Fracture interval	102	117											possible drilling disturbance, no orientation preference
3	Bisquit	21	47							57	107			
	Bedding/ dark seam	63	63.5	90	4	0	3							
	Bedding	71	71.5	90	4	0	2							top of ash layer
	"	92	92.5	90	3	0	12							
	Top of Ash	105.5	114.5	90	48									curved to contact. ~~possibly drilling disturbed~~ Bottom of ash is stepped with similar 90/48 orientation. 270/07 Ash foliation/ normal sense of offset. ~2 cm offset.

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 24 **Observer:** KS + AF + HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
3	Dark seam / bedding	121.5	122	270	04	180	08			116	148			
a	heavy drilling disturbance	⁂												

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 25 **Observer:** KS + AF + HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	major drilling disturbance	0	13							16	75			
	fracture interval	0	45											2-3 cm spacing w/ 2 preffered orientations 90/ 270/
		19	21	270	17	0	44							
		28	29.5	90	18	0	43							
	fracture interval	57	67											1/2 - 1 cm spacing, no orientation
	bedding	67	71	270	38	0	50							- grey to brown grey contact
	curved drilling disturbance ?	76	93											alteration color follows curves
	fracture interval	93	125											1/4 cm at top to 1-2cm bottom fractures w/ no preffered orientation

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 Site: C0019 Hole: J Core: 25 Observer: AF Summary:

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	Bedding color contrast	50	53	90	30	0	11							Bottom of dark band 3-8cm thick with burrows within/making up top of it. very sharp contact with greener rock beneath!
	Dark seam	70	74	270	25	180	6							Dark seam/fracture seperating two slightly different color chunks with possible bioturbation at different angles
	Fracture zone	84	113	90	0	270 ±25	0							High angle fractures regularly spaced (2cm), 14cm long each (four) No offset of bioturbation features that dip more 270°
	Bedding	104	104	270	82	0 very faint	0							Color change, maybe some banding or bioturbation
	Fracture	108	114	270	40	0	45							maybe (thrust) offsetting sub vertical banded feature w/ same orientation
		113	119	270	42	Not a discrete plane, very fragmented								very fragmented section — steeper dip on core face
														same as above frac, no features to see offset very fragmented
	Fracture zone	21	69											No preferred orientation, fragments 1-2cm wide, 2-3cm long crossing bioturbation/bedding but not offset
	Fracture zone	69	82											Intact chunk w/ dark seam through it Possible biscuiting at top and bottom
	Fracture zone	104	120											Very fragmented and fractured. No preferred orientation fragments <1cm

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 2S **Observer:** AF, KS, HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
3	Normal Fault or bioturbation	9	18	90	58	—	—							Offsetting dark wavy bioturbation maybe two that branch from 9 cm and split before 12cm
	micro offsets	7	12	~~90~~ 270	46	—	—							wavy dark bioturbation or small normal offsets from microfractures/faults
	Bedding	44	45	90	18									Dark wavy band
		52.5	54	270	10	0	8							Dark/lighter layer
	Dark seam	55	59	90	30	180	29							truncation? or just bioturbation? no offset to check Fracture
	Dark seam	70	74	90	30	—	—							
2	Dark breccia													

CHIKYU Operation

Sec. 2 — YY. CR

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 26 **Observer:** HS, AF, KS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1.	Bedding Planes	15	23	90	38	0	1			15	24			Green altered
	Fault	23	23	90	0	5	70	66	270	16	26			with striations
	Heavily Fractured Zone	28	52											fragment size 1~10mm
	Bedding Planes	62	71	270	35	180	4			62	71			black and green planes
	Bedding Planes	72	79	270	32	0	10			71	80			black and green planes
	Fault	69	67	270	77	335	0			62	71			~2cm displacement, normal fault
	Drilling Breccia	80	97											
	Moderately Fractured zone	97	126											
	Fracture	112	129	270	66	42	0	35	270	106	122			with striation
2	bedding	53	55	90	22	0	30			49	105			
〃	〃	62	63	90	15	0	33							
〃	N. Fault	50	52	90	58	358	0							0.5cm offset
〃	bedding	127	133	90	65	—								

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 27 **Observer:** YY + CR **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	drilling disturb.	0	17											phacoid-shaped clasts in watery mud ↳ primary?
2	fracture	3	8.5	90	63	180	45			0	36			
"	fracture	15	17.5	90	18	180	14			42	85			
"	fracture	24	33	90	61	0	9							
"	bedding	31	33	90	9	0	1							
"	fractured zone	42	69											size: 0.5cm x 1cm created by rep. fracture set + sub horizontal thickness: 17cm, spacing: ~0.4cm
	↳ represent. frac.	41	46	270	46	180	19							
3	fractured interval	0	50							50	71			size: 0.3cm x 0.1 (0-6 & 36-45cm), 2.5x1cm (6-36cm) created by rep. frac. set + sub horizontal, thickness: 6cm, 30cm, & 9cm spacing: 1.6 (6-36cm)
	↳ repres. fracture	8	20	270	79	180	11			95	120			
"	fractures (n=2)	73	91	90	75	0	7							
"	bedding	109	109	270	2	0	5							dark seams in block bounded by 2 fractures (wispy)
4	fracture	14	15.5	90	27	0	69	42	270	0	26			
"	bedding	56	67	270	8	180	12							
"	fault	105	101	90	61	measured on CT → 180/56								vertical hairline fractures (~3cm long) start along fault & radiate down altered 0.5cm above fault + clays ?
"	fault	84	100	90	39	180	9							
"	drilling disturb.	72	124											curved fractures from 90° side of core, only distinct 2.5cm onside
CC	soft sediment deformation (microfaults)	7	21											graben, warp bedding, colorful

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 28 **Observer:** YY+CR **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	slump fold w/ injections	17	22							None?				general: lots of discrete blocks & potential biscuits ↳ open fractures (drilling) orientation measurements may be affect
	bedding	22.5	23	270	10	0	7							w/ pyrite nodules
	fault	38	42	90	37	0	12							
	bedding	39	39	90	2	0	5							
	drilling disturb.	67	108											
	fractured zone	128	140											curvi-planar fractures @ edge of core liner
	bedding	57	58	90	7	0	7							
	bedding	122	124	90	20	0	9							
2	bedding	9	11	90	49	180	49			none?				general note: potential biscuiting ⇒ bedding ⇒ biscuits
	"	17	21	270	45	180	20							
	"	42	45	90	27	180	19							
	"	49	53	270	34	180	4							
3	bedding	9	11	270	19	0	28			0	65			
	"	41	42	270	33	0	28			65	98			
	fractured interval	33	74											
	rep. fractures conjugate sets	33	41	270	55	0	29							size frag: 2×3 cm thickness: ~45 cm, spacing: set 1: 2 cm set 2: 3 cm
		40.5	46	90	64	180	26							
	dark seams	79	88	270	70	180	5							
	2cm × .3cm pyrite	105	107											wispy along bedding? size: .5 x .7cm, thickness: 7cm, no preferment.
	fractured interval	98	105											
4	fractured	20	91											slightly brecciated along fractures - drilling related? + breccias at edge of core - also drilling?
	interval conjugate set (representative)	40	45	270	42	0	31							
		52	55	90	30	180	29							
		81	84	90	26	180	9	43	270					

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 29 **Observer:** YY+CR **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	fractured interval top frac conjug. set	0 14 35	50 19 28	270 90	42 56	180 0	23 15			none?				size frag: 1.1x16cm(avg) thickness: 50 cm, ~~size~~ spacing: 0.5-1cm
"	"	50	80											drilling disturbed, slushy
"	"	80	94											similar orientation size frag: large: 1x1cm small: .1x.1cm, spacing: irregular
"	"	94	98											yellow color, spaced shapes 1.5x.1cm
"	"	100	119											drilling radial fractures around void, curviplanar crack/void, irregular spacing & frag. size ≈ tensile
"	"	119	126											
"	bedding	93	96	270	37	180	12							
2	bedding	17	21	270	11	0	12			0	17			yellow ash layer pencil-shaped lenses
"	fracture	48	50	90	16	0	55	44	90	21	58			dominant set, large spacing for whole core ~5.5cm
"	"	83	89	90	46	0	35			58	80			
"	bedding	121.5	121.5	90	1	0	12			90	119			@ 119 thin clay laminations on 1cm wide disc but could be biscuiting
3	bedding	33	33.5	90	12	180	28			120	140			similar orientation to bedding measurement @ 121.5
"	fracture zone	38	58											contact w/ yellow ash/clay above
"	fault (normal)	62	73	90	63	0	30							size: 0.8 x 1.2cm, thickness: 2.0cm, spacing: variable ~0.9cm, no pref. orient.
"	fracture	36.5	42.5	270	57	51	0	36	270					
CC	soft sed. def/ dark seams	0	9											
	Biscuit													

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 30 **Observer:** AF, KS, HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Fracture Zone	0	25							3	25			Moderately to minorly fractured Slightly to moderately disturbed by drilling (100% material) No preferred orientation of fractures (maybe 270 direction) 3-5cm wide chunks/fragments Fracture spacing every 3cm or so
	Heavily Fractured Zone	23	51											Brecciated, highly disturbed 1/2cm to 1cm fragments dominant. No strongly preferred fracture orientation (90 from 23-40, 270 from 40-51) 1cm fracture spacing
	Fractured Zone	51	78							51	57			Larger ~~fragments~~ fractured chunks ~ 5cm long with 2-3cm fragments making it up. Bounded by very brecciated <1cm fragments - around 3cm thick zone Repeated 63-69 chunk, breccia, 71-74 chunk, breccia
	Minor Fracture Zone	80	100							80	100			Moderately fractured but mostly intact chunk No preferred orientation Fragments of fractured areas are small and on edge of core Likely drilling disturbance
	Fracture	14	20	270	48	180	60	40	90					Striations
	Fracture	19	25	90	44	180	38	—						
	Bedding? Burrow?	20	20.5	270	6	180	1							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 30 **Observer:** AF, KS, HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	Fracture Interval (Soft sed def)	1	15	—						Whole core				Microfractures with micro offsets or just fracs and disturbed bioturbation. Identifiable bedding hard to find. Cracks make lighter seams in dark bedding. No preferred orientation. Ends at top of Ashy layer
	(?) Ashy offset Sharp contact	14 "Normal Fault" 15.5	19 20	~90 90	42	CT 180	CT ~36			0-47 sandy layer				Round plane so hard to get measurement. Very sudden contact between ashy and dark mud but it is wavy and blocky plane. Normal fault that may by offsetting about feature 90/42
	Dark Seams	19	23	90	~30	CT 180	CT 35			63-110				Appear to crosscut roughly horizontal bedding/bioturbation features. Not continuous from one side to other (minor offsets or merging)
	bioturbation wavy / bedding	24	30	—										
	Biscuit (?)	30 Dark seam 34	36/38 36	270	38									Some dark seams below biscuit apparent top, dipping 270
	Biscuit (?)	38	46	—										32-36cm until truncated by two parallel horizontal seams (biscuit bottom?)
		64												Biscuit top under the two parallel dark seams
	Sharp contact Fault?	72.5	79	270	CT 46	CT 180	CT 53							Ashy/green layer have blocky offset in Normal sense but not a planar/clear fault. Truncating dark layer beneath
	Normal Fault	84.5	92	90	CT 49	CT 180	CT 32							offset Disturbation and sandy layer 1/2cm offset
	Biscuit top?	73												
	Biscuit top	103	110											

CC Heavy drilling disturbance drilling breccia

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 31 **Observer:** AF, KS, HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Fracture zone Heavy drilling dist. Breccia	1	18											Brecciated, heavily drilling disturbed
	Fracture zone	18	65							19	68			Intact chunks 3-6cm long. Fractures 3-5 cm spacing Not offsetting bedding 21-46cm preferred orientation to 90 46-65cm preferred orientation to 270
	Drilling Brecciated	65	85											
	Bedding	24	24	90	1	180	7							
	Bottom of Biscuit (?)	35 1/2												
	Fracture	39.5	42	90	20	180	5							
	" "	44.5	46	90	20	180	8							
	" "	47	50	270	29	0	12	30	90					Striations
	" "	51	54	270	20	0	25	60	90					Striations
	" "	53	59	90	45	180	12							
	Bedding	60	60	90	1									

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 31 **Observer:** AF, KS, HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	Heavily disturbed	1	15											
	" "	15	23											
	Intact chunk	23	27							23	27			Fracture in chunk, very horizontal on face and shallow dip on 2nd plane Striations
	frac	23.5	24	90	1	180	38	90	270					
	Bedding bottom is biscuit	24	24	90	3	180	8							
	drilling brecia	27	32											drilling breccia, small 4cm clasts/fragments, no preferred orientation
	Heavily disturbed	33	40											Heavily disturbed 1cm - 2cm wide fragments, no preferred orientation
	Fracture Zone	56	70	~270						58	70			One large 270 fracture and smaller 270 small branch down
	frac	59.5	70	270	70	180	31							
	Frac Zone	70	78											No preferred orientation, mm sized clasts to 1cm sized fragments very disturbed
	Frac Zone (biscuit bottom)	76	84											No preferred
	Bedding	60.5	63	270	15	180	10							
	Possible bedding	68.5	71	270	25	180	12							Intact piece at edge/sharp contact w/ very brecciated section
	Drilling Breccia	84	105											

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C009 **Hole:** J **Core:** 31 **Observer:** AF, KS, HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
3	Heavily disturbed	0	3											<1½cm fragments, no orientation
	Fractured fragment	3 5	10 9	270						3	10			Largest fracture measured No preferred orientation. Fractured intact chunk Black seam where frac face isn't open
	mod disturb	9	24											½cm to 3cm sized fragments, increasing w/ depth. No preferred orientation
	Fract Chunks	24	52							29	52			No preferred frac orientation. Top chunk may be biscuit (21 cm) Fragments in chunks 2-5cm. Bedding dip 270, no offset 25-47cm 47-52, top of another biscuit (mud), bedding dip 90
	Curved frac	26-38	that curves around/under core face											
	Bedding	33	38	270	42									Can't see anything 2nd plane, core face looks like bioturbation
	Bedding Plane	50	53	270	25	180	11							
	mod Frac zone	52	80											Presumed bedding from orientation and sharp contrast of intact + brecciated
	Fract	78	83	270	33	150	35	Top of chunk						1cm to smaller fragments, some fractured but not offset burrows, no preferred orientation
	Frac chunk	80	90	90 → biscuit bottom						80	90			Intact chunk with fractures 270 orientation but variable degree of dip
	mod to heavily disturbed	90	126											2cm fragments until 98cm, 1cm fragments until 105, then total disaggregation Conjugate fracs, largest axis are 270 oriented
CC	Drilling Breccia													

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 32 **Observer:** HS, AF, KS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Drilling Breccia	0	19											
	Moderately fractured	19	33							19	33			fracture spacing 1~2 cm
	Drilling Breccia	33	41											
	Heavily Frac Zone	41	54	270	14	180	42			41	54			fracture spacing 2-10 mm, dominant orientation 270/14 ↳
	Drilling Breccia	54	59											
	Heavily Frac Zone	59	70	70	36	0	27	90	50	59	70			fracture spacing 2-10 mm,
	fracture	22	26	270	39	0	72	9	~~90~~ 270	19	33			w/ striations
	fracture	25	26	270	18	0	68	19	90	"	"			w/ striations
	bedding	29	29	0	78	270	2			"	"			
2	Heavily Disturbed by drilling	98	124											
	Heavily Fractured Zone	124	137											
	Fracture	124	128	270	38	180	35 (CT)			124	137			1mm thick filling w/ coarser grains and black grains
	Heavily Disturbed	0	21											
	Heavily Fractured	21	36	90	32	0	43							representative measure @ 32~35 cm
	Drilling Breccia	36	40											
		40	77											
	Bedding	46	47	90	9	~~A~~ 180	45							
	fracture	40	52	270	60	315	0							
	fracture	63	64	90	13	180	43							
	Drilling Breccia													

mod. disturbed

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** **Hole:** **Core:** 33 **Observer:** AF, KS, HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Heavily disturbed	1	17											Big chunks but uncertain about being displaced while drilling
2	Mod disturb Frac zone	1	9											1cm sized fragments, no preferred frac orientation
	Frac zone	9	75							9	98			Intact chunks of bedding with fracs within and higher density surrounding. 5-10cm length each. Fracs oriented 270
	Frac 1	9	23	270	69	221	0							
		20	26	270	41	180	25							
		27	35.5	270	55	310	0							
		62	68	270	47	0	27							
	Bedding	14	23	270	47	180	28							
		24	31	270	43	180	20							
		38	45	270	55	305	0							
		45.5	46.5	270	11	180	50							
		55.5	58.5	270	12	180	50							
		68	69	270	10	180	50							
		78	86	90	54	180	37							
	Bedding	87	94.5	90	52	337	0							
	Frac	82	98	90	66	296	0	45	90	98				striations

Sec 2 78 86.5 90 54
Sec 3 63 70 90 42

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 Site: C0019 Hole: J Core: 33 Observer: AF, KS, HS Summary:

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
3	Heavy dist	0	16											Breccia, no structure. <1/2cm pieces
	Mod dist	16	62							33	42			Larger fragments 15-33cm 1-3cm wide 33-42 3-4cm wide 42-50 conjugate breccia, heavily disturbed 50-62 ~5cm wide fragments Biscuit Bottom
	Frac	53	59	270	50	180	22							fractures roughly 270 at varying dips
	Bedding	64	72	90	42	180	20			66	74			
	Frac	70	82	270	60	313	0							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 33 **Observer:** HS, AF, KS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
4	Moderately Fractured	0	17											Spacing 5~20 mm, moderately disturbed
	Bedding	20	23	270	30	0	44			17	30			
	Bedding	34	38	90	38	270	63			32	43			
	Heavily Disturbed	40	137											
5	Bedding	13	20	90	48	180	17			11	25			green-black layer
	Drilling Breccia	0	11											
	Heavily Disturbed	11	45											
	Heavily Disturbed	73	124											
	Bedding	51	54	270	27	0	59			45	72			
	fracture	52	55	270	27	0	59	33	270					bedding-parallel fracture w/ striation
6	Heavily Disturbed	0	20											
	Bedding	26	27	270	13	180	44			20	37			
	Heavily Disturbed	37	140											

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 33 **Observer:** KS + AF + HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
7	Bedding	17.5	22.5	270	40	0	37			8	27			Drilling disturbance at top 1-8cm, moderately disturbed 8-27cm slightly disturbed to no disturbance
		32	36	270	42	180	31			31	37			
		59	68	90	60	180	42			61	77			
	drilling dist	78	98											Heavily disturbed/Breccia
	drilling dist ~~frac~~ zone	97	113											Moderately disturbed, heavily fractured roughly 270 orientation 1-2cm fragments
8	Heavy dist	0	11											
	Mod drill dist	11	43							15	31			Intact chunk 15-31, 2-3cm fragments below no preferred frac orientation. 3cm frac spacing
	Slightly drill dist	43	71							43	61			3 larger fractures, no measurable planes
										69	98			Intact chunk, ~~fractures are not rotated~~ microfractures
	Bedding	24	36.5	90	65	180	36							Slightly disturbed, no real preferred orientation intact chunks with minimal measurable frac planes
	Frac	76	78.5	270	24	180	35							
		81	84	270	28	180	55							
CC	Slightly to mod dist													Intact chunks, no bedding Biscuiting many microfractures

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 34 **Observer:** YY + CR **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	fracture set 1	28	32	270	33	0	41			0	105			conjugate sets, bioturbated fragment
	fracture set 2	74.5	78	90	9	180	46							
	fractured zone	0	105											
2	bedding	2	9	270	50	22	90			0	24			spacing: 1-3cm, size: 5x3cm
	fractured zone	44	60							44	60			size: 4x1cm → .5x.3cm thickness: 7cm preferent: similar to 85-84cm, wavy/anastomosing, spacing: variable, 3cm, -3cm, avg ~ 1cm
	drilling breccia	60	80							80	90			
	fractured zone	70	107							90	107			size: variable 2.5x5cm, 0.5x0.3cm thickness: 37cm, wavy anastomosing frac spacing: ~3.5cm but variable
	rep. fracture	85	94	270	57	0	24							
	bedding	87	88	270	7	0	29							in fractured area so hard to tell, + burrows
	bedding	102	105	270	20	0	13							dark seam
3	fractured zone									10	30			
	rep frac: 1	22	27	270	50	0	26			45	106			
	" " 2	22	25	90	31	180	15							
	slump/soft sed deformation	45	106											measured on CT biscuiting - cataclasis darkseams
	fault	56	61	180	54	270	30							dark seam
	fault	54	57	180	41	270	26							
	bedding	62	65	90	36	270	53							
	normal fault	71	82	90	79	180	67							
CC	slump/soft sed def.													

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 35 **Observer:** YY + CR **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	bedding	23	33	270	40	180	62			21	37			
	"	53	53	270	28	180	63			42	61			
2	bedding	47	47	270	34	180	53							
	"	9	15	90	56	180	52			2~~[illegible]~~ 33	15 maybe 27 58			
3	bedding	8	18	270	70	32	90			8	20			
	"	105	114	90	64	90	37			78	118			
	conjugate frac set	105	109	90	40	0	56	74	90					
		101	105	270	45	0	22							
4	bedding	62	63	90	37	0	42			33	85			
	fault - normal	65	63	90	35	180	18	45	90					Offset ~1 cm, similar orientation below; fracture w/ alteration for 0.8cm
	bedding	78	80	90	35	0	40							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 3/6 **Observer:** YY+CR → KS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	fracture	26	29.5	90	22	0	41			0	138			
	fracture	32	50	270	70	37	0							
	Bedding	61	66	270	38	180	36							
	normal fault	67	70	90	26	0	15							
	Bedding	71.5	73	270	11	180	48							
	fracture	80	86.5	270	47	180	37	57	90					
	"	101	114	90	66	38	0							
	"	115	128	270	71	349	0							
	"	122	134	270	64	351	0							
1	fracture interval	0	78							0	129			variable sizes of 1-3cm spacing. 3:1 aspect. ~270/45 orientation
	"	5	9.5	270	44	180	28							
		7	13.5	270	52	180	32							
		65.5	68.5	270	30	180	27							
	drilling dist.	78	96											curved fractures with radial pattern from 87 (center of radial pattern)
	fracture	101	117	90	73	40	0	30	270					
	"	117	131	270	64	16	0							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 36 **Observer:** KS, AF, HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
3	fracture zone	0	20							0	141			2-5cm spacing, ~90/50 orientation
	"	2	10	90	53	340	0							
	fracture zone	23	81											3-9cm spacing, ~270/35,40
	"	48	52	290	38	180	55							
	"	36	44	270	51	0	0							
	"	73	80	270	50	180	44							
	fracture	100	108	270	46	180	12							
	fracture zone	120	141											3cm → 1/2cm spacing @ bottom. no preferred orientation
4	fracture	14	30	90	69	0	0			0	56			
	fracture zone	58	131											→ 1/4 - 1cm spacing, 2/1 aspect ratio of fragments that
		91	110							56	148			are small (25-50mm from 58-89 and 114-126) → preffered orientation is 90/45
	"	91	94	90	38	180	02							
	"	105	108.5	90	31	180	41							
	"	110.5	115	90	32	180	31							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** ~~B~~ J **Core:** 36 **Observer:** KS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
5	fracture zone	0	148											slight to moderate, likely drilling. 2-5 cm spacing/ frag size. 2 orientations ~90/60 270/40
	"	13	19	270	40	180	50							
	"	77	98	90	73	330	0							
	"	129	133	270	30	180	5							
	"	112	122	90	58	330	0							
	dark seam	106	114	90	56	180	29							
	"	136.5	137.5	270	9	0	8							

CHIKYU Operation

~~Interval~~ J

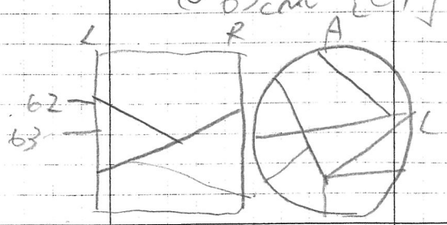
No.

Structural Geology Observation Sheet

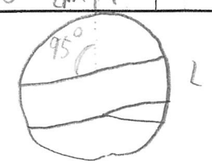
Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 37 K **Observer:** HH, YH, DG **Summary:** Moderately disturbed by drilling

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip az.	Core face app. Dip dip	2nd app. Dip az.	2nd app. Dip dip	Striation on surface rake (≦90)	Striation on surface from (±1, 90 or 270)	Coherent interval (for P-mag) top	Coherent interval (for P-mag) bottom	P-mag pole az.	P-mag pole dip	Note			
																	CI in CT
1	bedding (CT) (V)	95	99	90	44	99 ↔	0			90	99						8-43
	"	90	92.5	90	34	127 ↔	0	→ ash layer		90	99						43-60
	fault (CT) (V)	59.5	73.5	90	90	0	52			60	89						60-89
	fault (CT) (V)	61.5	68.5	270	47	180	22	← ?		60	89						
	bedding (V)	91	93	90	44	57 ↔	0			90	99						
	Mod. disturbed	0	100														
2	dark seam (V)(CT)	71	74.5	270	34	180	1	CT		36	88			1mm thickness (dark seam)			
	bedding (V) (CT)	36	51	90	58	0	20	CT		36	88						0-33
	~~bedding (V) (CT)~~	~~24~~	33	~~270~~	~~60~~					~~0~~	~~33~~						36-88
	bedding (V) (CT)	2	13	270	57	180	7			0	33			NOT continuous. No input			
	bedding (V, CT)	2	4	270	52	180	4			0	33						
	Mod. disturbed	0	92														
3	Bedding (V) (CT)	24.5	44	270	77	180	23	CT									
	dark seam (V)(CT)	~~28~~ 18%	~~30.5~~ 20.5%	90	19	180	24	CT		0	95						0-95
	N fault (V)(CT)	29	31	90	17	180	14	CT		0	95						
	Mineral-fill-vein (V, CT)	62	64.5	270	26	0	30	CT		0	95			Thin zeolite veins, web-like structure, [61 ~ 66] : CT			
		61	63	270	19	0	26	CT		0	95						
	Fault (V, CT)	56	60.5	270	34	0	21			0	95						
	Mod. disturbed	0	54														

@ 63cm [CT]



@ 62cm A



E Heavily disturbed.

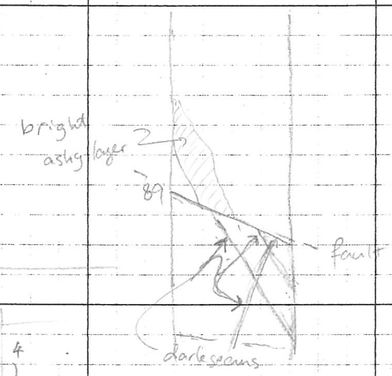
CHIKYU Operation

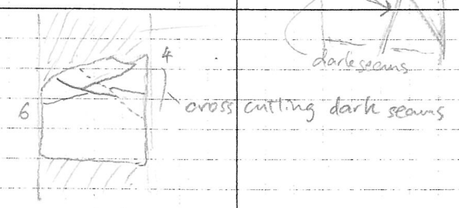
No. J

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 38K **Observer:** HO AL **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Darke seam	37	54	90	70	180	35			0	62			vertical to sub vertical dark seams
	~~Contact~~ Dark seam	65	65.5	270	7	180	20			62	130+			with horizontal to subhorizontal
	Darke seam	53	62	270	80	0	66							conjugate dark seams
	Darke seam	131	134	270	45	180	20							
														appears to be lithified MTD with interbedded ~~dark~~ ~~grey~~ black mudstone (5Y 2/1)
	contact between dark grey mud & dark black mud													
2	Dark seam	23	27	270	50	180	55			0	100		(maybe)	
	"	67	76	270	65	0	23			100	120			
	"	90	97	90	60	180	75	conjugate dark seams						
	"	92	96	270	65	180	83							
	fault	89	93	90	30	180	41							
3	Dark seam	4	6	270	25	0	20			0	48			
	Dark seam	5	6	90	5	180	5			48	70	70		
	"	99	108	270	80	0	87			70	93			
										93	96			
										96	116			
4	Dark seam	2	4	270	30	0	30			0	8			
	"	47	56	90	80	0	58			8	75			
	"	70	73	270	40	180	65							
	fault	98	38	270	75	180	59							
5	dark seam	48.5	49.5	270	10	180	3			0	64			
	"	14	22	90	65	180	57			64	92			





CC Heavily disturbed

CHIKYU Operation

Structural Geology Observation Sheet

2nd → et 2nd done

No.

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 39K **Observer:** HO AV **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Dark seam	32	33	270	15	180	54			0	4			significantly more pumice, scattered in upper ~~section of~~ part of section 1
	=	59.5	61	270	15	0	13			5	33			
	=	76	81	270	60	0	44			33	42			
										43	49			
										55	62			
										71	85			
2	Dark seam	104	106	270	35	180	21			20	39			
										39	46			
										65	86			
										102	110			
cc	Disturbance	0	12							12	19.5			isolated clast 25-29
										21	27			
										29	32.5			

CHIKYU Operation

No. J

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 40K **Observer:** YH. HH **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note			
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip				
1	Dark seam (v.CT)	10	15	270	40	0	16			0	93			Slightly disturbed (82-93)			CI 0-93
	〃	14	17	270	38	0	27			0	93						
	Bedding (v.CT)	14	53	90	77	158	0	CT		0	93						
	Reverse fault (v.CT)	25	28.5	270	38	0	2										
	〃	27	29.5	270	22	0	4	CT									
	Dark seam (v.CT)	54	55	90	9	0	54										
	〃	56	60	270	32	180	19										
	〃	66	66	270.	5	180	13										
	〃	83	91	270	63	180	6										
2	fault (v.CT)	3	9	270	53	0	5			0	128			→ litho boundary	relatively intact!		0-128
	dark seam (v.CT)	72	73.	90	14	0	30										
	Bedding (v.CT)	95	105	90	85	150	0										
	fault (v.CT)	123.5	128.5	270	41	180	9										
3	dark seam	64	71	90	52	0	72			0	134			Fault @ A-P surface, CT (73-84) w/ deformation band			
	dark seam (v.CT)	103	104	270	19	180	59	81	90								
	〃	105	110	270	34	180	68										
	〃	128	130	270	29	180	9										
	N. fault (v.CT)	129	131	90	40	180	66										
	Bedding	0	32	90	83	0	82										

CHIKYU Operation

No.

Structural Geology Observation Sheet

J

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 40k **Observer:** Y.H. ~~H~~/, D.G **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note			
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip				
4	Dark seam (V,CT)	7.5	15	270	48	180	39										
	〃	15	17	270	51	180	16										
		17	21	270	49	188	0										
	Dark seam (V,CT)																
	〃	92	94	90	19	180	51										
	〃	84	88	90	61	180	81										
	Bedding ?																
	Dark seam (V,CT)	48	51	270	26	187	0										
	〃	52	54.5	270	28	0	1							lithology			
	〃	54	55	270	52	180	1							vertical	Dark seam, boundary		
5	Dark seam (V)(CT)	4	11.5	90	40	180	70										
	〃 (V)(CT)	25	29	180	07	270	39										
	fault (V)(CT)	31.5	36	180	10	90	48	60	90								
	fault (V)(CT)	11	24.5	180	14	270	70										
	Dark seam (V)(CT)	36	37.5	270	16	0	14										
	Dark seam (V)(CT)	85.5	88	270	32	0	5										
	↳ displacement																

CHIKYU Operation

No.

Structural Geology Observation Sheet

J

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 40K **Observer:** HH **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
6	Dark seam bands (V)(CT)	29	30.5	90	16	180	1							
	"	45	50.5	90	48	0	16							
	"	67.5	73	90	30	180	57							
	"	100	107	90	47	0	15							
7	Dark seam bands (V)(CT)	0	6	270	50	0	26							
	Dark Seam (V)(CT)	73	84.5	270	64	0	22							
	"	60	65	90	43	180	8							
	"	104	106	90	50	180	42							
	"	23	24	90	7	180	33							
	"	39	45.5	270	48	180	56							
	"	43.5	46	270	25	180	35							117-119 pyrite
	"	31	32.5	270	18	180	15							
8	Dark seam fault	73	76.5	90	24	180	13							→ bedding changes at this fault.
	"	61	71	90	60	180	31							
	Dark seam	45	63	90	70	180	52							
	Bedding? (V)(CT)	95	97	270	26	180	30							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 Site: C0019 Hole: J Core: 41 Observer: YH. HY Summary: J

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note			
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip				CI
1	Dark seam (V.CT)	26	31	90	36	0	32			24	98						8-18 24-98
	〃	26	31.5	90	36	0	45										
	〃	36.5	37.5	270	17	0	43										
	〃	59	61	270	18	180	9										
2	Dark seam (V.CT)	3.	16.5	270	65	0	9			0	90						0-3
	Bedding (V.CT)	24	52	90	77	17	0										
3	Bedding (V.CT)	0	11	270	64	40	0			0	52						0-52
	Dark seam (V.CT)	16	20	270	58	180	9										
	〃	~~20~~	~~22.5~~														56-80.5
	〃	38.5	42	90	36	180	28										
	〃	47	50	90	25	0	30										
normal 4	~~Dark Seam~~ fault (V.CT)	14	34.	270	71	180	2.			0	~~10~~ 92						0-~~14~~ 92
	Dark seam	63.5	65	90	11	0	38			104	112						~~92~~ 104-Bott
	〃	65	66.	90	8	0	33.										
	Bedding (V) (CT)	16	52.	90	81	180	81										
	Darkseam (V)(CT)	38	40	90	18	0	13.										
	〃	52	58.5	270	49.	0	42.										
	〃	102	111	90	76	0	5.										
	〃	103	111	90	67	28	0										

CC disturbance.

CHIKYU Operation

Structural Geology Observation Sheet

J

Ex

~~(1 not~~ yet. done

No.

Exp.: 405 Site: C0019 Hole: J ~~K~~ Core: 62K Observer: AL HO Summary:

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Dark seam	20	24	90	24	0	21			17	25			micro faults within fault system at top of section 1 between 6-15 cm have small shear offset indicators. will measure separately for apparent dip (too small for CT 2nd dip) — Aubrey
	"	34	39	270	50	0	70			25	46			
	fault system at the top													CI (CT) 0-3.5, 4-15, 17-25, 25-46, 46-52 — do not put in spreadsheet
	Thrust	6	9	270	26	0	23			4	15			
	Thrust	10.5	15	270	30	0	46			4	15			
	Thrust	13	15	270	21	0	49			4	15			
2	Dark seam	42	46.5	90	17	180	27			42	148			42-148
	"	65	74	90	65	180	4							
	"	98.5	102.5	90	35	180	62							
	"	112	119	90	53	180	59							
	"	60	70	90	65	0	65							
CC	Disturbance (Heavy)	0	37.5											

Drilling Breccia 0-8cm
slightly disturbed 8 - 30cm
void → heavily fractured 16-18cm
by drilling
sec 3-300255

(J)

(Ex) ~~CI not yet~~ done

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 43K **Observer:** KO AL **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Dark seam	11	23	90	70	0	50			0	62.5			CI(CT). 0 - 62.5
	"	15	18.5	90	40	180	14							63 - 93.5
	"	16	35	90	75	0	68							
	"	30	35	90	40	0	27							CI
	App. Nor. fault	88	92	270	30	—	—							63 - 93.5
	"	89	94	270	35	—	—							
								Contrast in the CT image is not high enough for measurements.						
2	n/a.													
3	wavy vertical bedding	73	104	90	85	180	85			37.5	106			0 - 29.5 29.5 - 37 37.5 - 106
4	Dark seam	62	73	270	65	0	40			0	85			0 - 85
	"	75	82	270	45	0	27			0	85			85 - 131
5	Dark seam	32	35.5	270	53	0	65			0	97			0.5 cm Pumice clasts? @ 29 - 30 very deformed
	Fault. normal	18	22	90	46	0	20			0	97			

CHIKYU Operation

No.

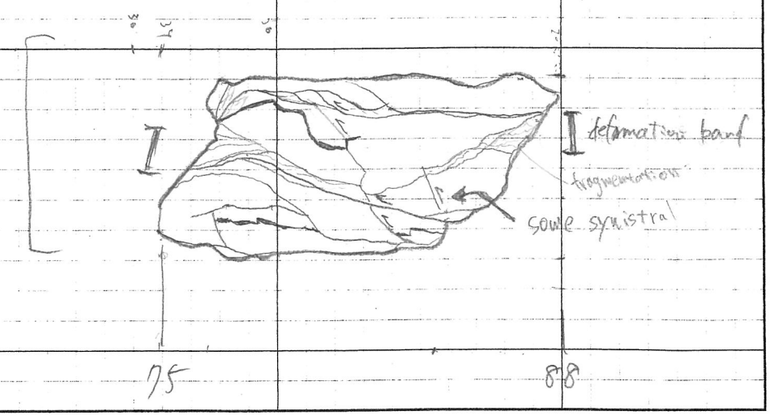
Structural Geology Observation Sheet

J

Ex

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 44K **Observer:** HH, YH **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note			
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip				CT
1	drilling breccia.	0	17.														17-30
	drilling breccia.	28.	39.											50-51 53-54	pyrite patches.		42-65
	Heavily disturbed	88	93														73-87 93-110
	Dark seam	75	75	90	6	180	24			73	89						
	=	76	76	90	14	180	42			73	87						
	Bedding.	42	55	276	76	57	0			42	65						
2	Fault (v.CT)	115	120.5	90	44	0	18			109	124						18-59
	Dark seam	120.5	122.5	90	19.	0	12			104	124						62-92
	Fault (v.CT)	106	116	90	64	0	75			108	124			deformation	fluids		92-101 104 124
	Fracture zone	63	74														
	=	74	88														
3	Heavily distubed	36	64														



drilling breccia 64 79
moderately disturbed 90 106

Cc Heavily dist. 0-18

CHIKYU Operation

Structural Geology Observation Sheet

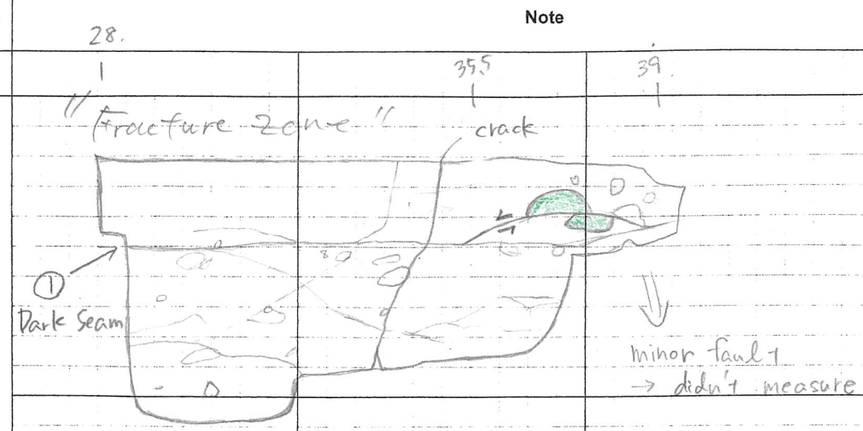
J

Ex

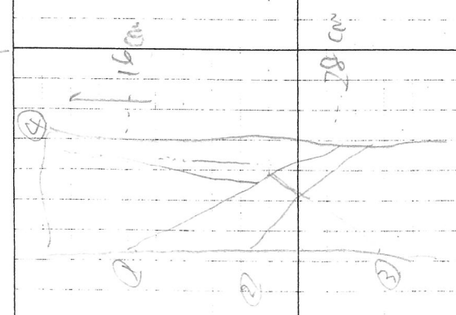
No.

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 45K **Observer:** HH **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip az.	Core face app. Dip dip	2nd app. Dip az.	2nd app. Dip dip	Striation on surface rake (≦90)	Striation on surface from (±1, 90 or 270)	Coherent interval (for P-mag) top	Coherent interval (for P-mag) bottom	P-mag pole az.	P-mag pole dip	Note
1	① Dark seam.	17	39	90	88	19	0			1	39			
	Dark seam.	23.	24.5	90	23	180	53.			1	39.			
2	N fault (v, ct)	7	8.5	270	14	180	15			1	11.5			
	Fracture (v, ct)	72	76.5	90	52	0	65			69	76.5			
	N fault (v, ct)	58	67	90	70	180	13			46	68			
	fault (v, ct)	60	67	270	75	10	0			46	68			
							CT.							
3	Heavily dist.	52	77											
	Dark seam (v, ct)	44	46.5	90	27	0	25			41	53			
		47	50	90	33	0	20			41	53			
										1	91			
	① :	16	28	90	63	180	41							
	② :	22	28	90	58	180	27							
	③ :	20	28	270	58	180	35							
	④ :	8	23	270	77	0	54							



1-39
43-66



1-11.5
11.5-35
46-68
69-76.5

1-31
41-53
77-92

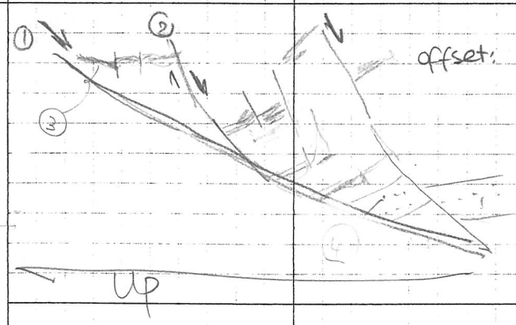
CC slightly dist. 0 26

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 96 **Observer:** D.G. **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note			
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip				CI
1	faults (normal) (v) CT	27.0	34.5	① 270	40	0	32			13	126				offset: 1mm - 10mm	array of small normal faults	13
				② 270	36	180	40										126
	dark seam ③ CT			90	44												
	bedding? (v) CT	34.5	37	90	39	biotubation											
	bedding? (v) CT	38.0	40.0	270	17												
	faults (v) CT	37.0	42.0	90	70	348	0										
	normal N. fault (v) CT	37.0	41.0	90	68	—		less contrast in CT									
	Fault CT	39.0	43.0	90	40	0	44	62	90					> irregular base			
	dark seam (v) CT (offset)	47.0	48.5	subhorizontal, offsett by subvertical faults													
	dark seam (v)	124.0	126.5	90	32	—	can't be seen in CT										
	dark seam (v) CT	76.0	89.0	270	65	180	50							becomes steeper (subvertical)			
	dark seam (v) CT	89.5	92.0	90	28	180	21										
	dark seam (v) CT	102.5	110	270	55	0	38							> could also be fracture			
	dark seam (v) CT	110.5	110.5	90	02	180	23										
2	dark seam (v) CT	1.5	6.5	90	46	180	36			0	13						0 - 13
	fault (v), normal (offsets dark seam) CT	0	6.5	270	65	180	54			1	1						43 - 68
	dark seam (v)	52.5	55.5	90	54	—	can't be seen in CT → lost on core surface										67.5 - 74.0
	dark seam or fault? (v)	55.5	57.5	90	23	—	biotubation							> seems to be offsetting dark seam			
	dark seam CT	60.0	65.0	270	40	180	26			43	68						

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** 19J **Core:** 46K **Observer:** D.G **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note			
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip				
3	dark seam(v)	15.0	15.0	90	02	180	56			0	90				coherent interval		
	dark seam(v)	19.0	22.0	270	20	0	34								0-90		
	dark seam(v)	24.5	28.0	90	26	0	64								90-104		
	dark seam(v)	42.0	48.0	270	49	0	22										
	dark seam(v)	72.5	74.0	270	16	180	39										
	dark seam	74.0	74.0	90	02	0	65										
	dark seam	81.5	82.0	270	14	180	28										
	dark seam	77.0	81.0	90	31	180	30										
	bedding	92.5	102	270	55					90	104						
	fault (apparent normal)	98.0	100.5	90	15	180	31										
CC	Bedding	9.5	15	90	81					10	16						CZ 10-16

Spreadsheet NOV 20

CHIKYU Operation

No.

0 + 180

Structural Geology Observation Sheet

Exp.: 405 **Site:** c0019 J **Hole:** J **Core:** ~~2~~ 47 K **Observer:** AL **Summary:** abundant v dark seams (vertical to subvertical) small faults & fractures in dark olive-gray mudstone minor pumice clasts, chaotic bedding

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	N. fault	10	15	270	50	0	33			7~~0~~	30			~~coring di~~
	N. fault	10	15	270	45	0	35			30	65			
	N. fault	10	15	270	63	180	57			65	76			
	Contact	13.5	14.5	90	5°	0	17							
	Thrust fault	19	24	270	45°	0	56							
	Fault	23	26	90	34	0	16							
	Dark seam	34	39	90	31	0	53							
	T. fault	47.5	49.5	90	22	180	9							
	T. fault	53	55	90	16	180	10							
	T. fault	61	64	90	18	0	34							
	T. fault	62	65	90	20°	0	17							
	dark seam	~~72~~	~~75~~	270	64	180	75							
2	Dark seam	36	39.5	90	34	0	19			0	15			
	Dark seam	38	47	90	65	180	80			15	30			
	Fault (unknown)	76	78	270	22	180	11°			30	35			
	T. fault	96.5	97	90	17°	0	30			60	78			
	Dark seam	107	109	270	11	180	26			78	87			
	Dark seam	110.5	110.5	90	5°	180	11			88	113			
	Fault	102	102	90	14	180	14							
	Fault	103.5	103.5	270	13	180	23							
	Fault	104.5	104.5	270	9°	180	28							
3	Dark seam	18	18	270	9°	0	0							
	Dark seam	35	36	90	11	0	14							
	N. fault	39	39	270	21°	180	19							

entered into spreadsheet
needs to be put into J cores

Major coring disturbance 0 – 8cm 3 68 – 80
minor CD 8 – 12

CHIKYU Operation

No.

Structural Geology Observation Sheet

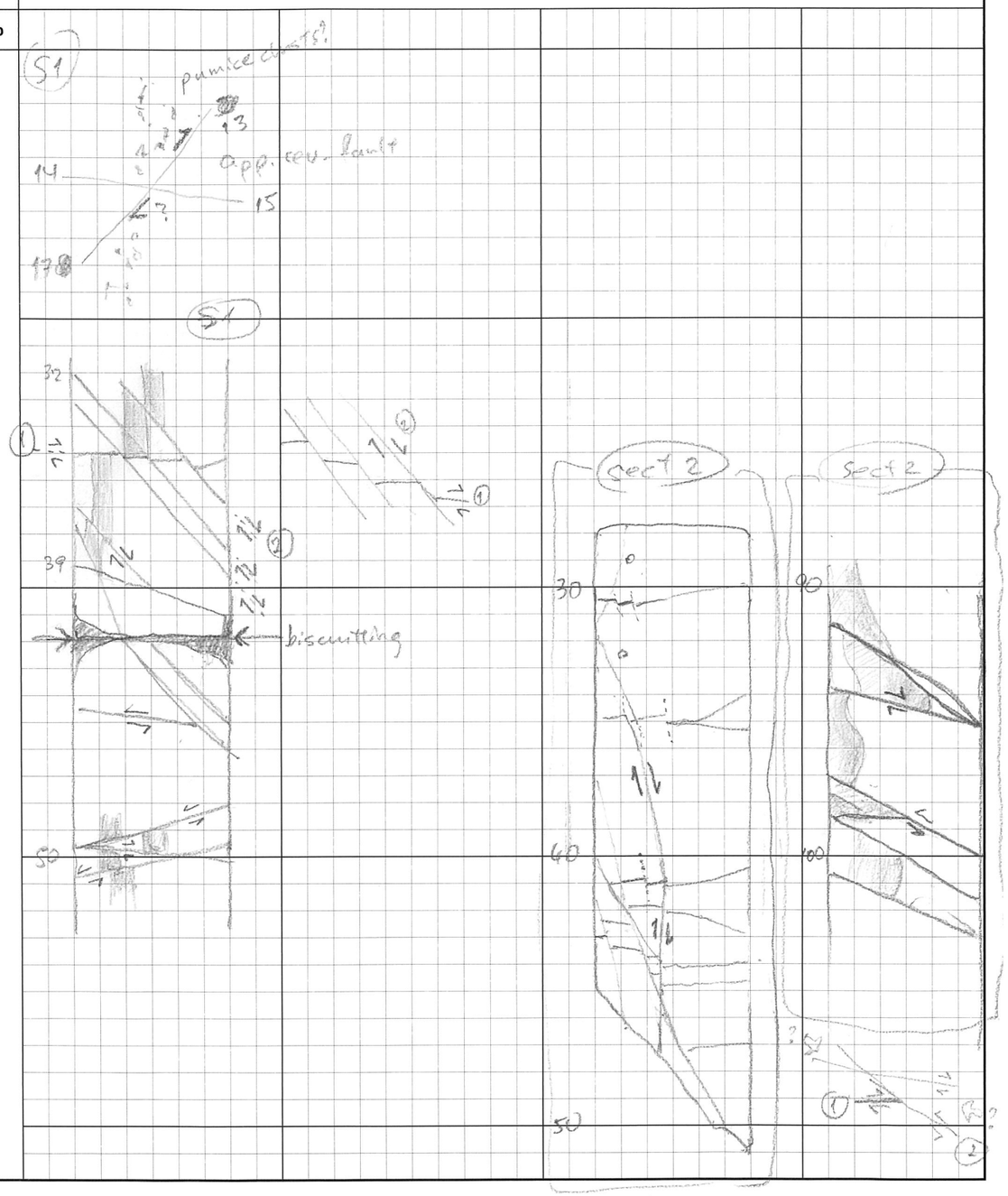
(J)

app. rev. fault

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 48K **Observer:** HO **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole	
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip
1	Dark seam	5	8	90	35	0	36			2	9		
										10	41		
	"	7	7	90	10	0	5						
										42	53		
	~~"~~	~~2.5~~	~~9~~	~~90~~	~~5~~								
										54	60		
	"	13	17	270	40	180	30						
	"	14	15	90	13	180	32	cross-cutting					
	~~"~~	~~20.5~~	~~21~~	~~270~~	~~5~~								
	"	19.5	27	270	70	180	43						
	"	19	24.5	270	40	180	13						
	~~"~~	~~25~~	~~27~~	~~270~~	~~32~~								
	"	32	38.5	90	50	0	25						
	"	33	39	90	50	180	27						
	"	32	36.5	90	50	0	57	NOT observed in CT					
	"	39	41	90	70	0	14						
	"	37.5	41	90	75	180	44						
	"	~~39~~	~~39~~	~~90~~	~~60~~								
	"	43	45	90	55	180	53						
	"	43	45	90	55	180	35						
	"	44	45	90	15	180	12						
	"	48	49	270	10	180	13						
	"	49	50.5	270	12	180	2						
	"	49.5	50.5	90	8	180	2						
	"	57.5	58	90	10	180	30			28	51		
2										52	116		

Note



Next sheet

CHIKYU Operation

No.

Structural Geology Observation Sheet

J

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 48K **Observer:** HO **Summary:**

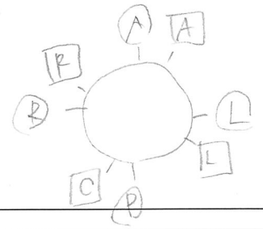
Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	Sed. fill vein	4	12	90	10	0	69	?		28	51			
	SFV			~~90~~	~~38~~	~~?~~	~~?~~	~~?~~		52	116			
	Dark seam	30	30.5	270	8	0	33							
	"	34.5	35.5	270	7	180	42							
	"	40.5	41	270	9	180	39							
	"	42	43	90	7	not visible in CT?								
	"	44	44.5	270	7	180	32							
	"	45	45.5	270	9	180	39							
	"	32	48	90	80	180	35							
	"	48	49	270	10	not visible in CT?								
	"	37	48	90	76	180	86							
	"	41	47	90	60	180	61							
	"	54	55	90	30	0	26							
	"	59	61	90	35	0	52							
	"	61.5	62.5	90	25	0	39							
	"	63	67.5	270	60	0	58							
	app. nor. fault	73	~~73~~	90	10	0	19	) cutting pumice						
	dark seam	78	80	90	33	0	27							
	"	84	87	90	30	0	14							
	"	92	95.5	90	35	0	37							
	"	94	95.5	90	20	0	12							
	"	97	100	90	30	0	21	→ surface is curved in CT						
	"	98.5	99	90	3	180	36							
	"	98.5	102	90	30	0	31							
	"	101	103	90	25	0	30							

[C] Disturbance

CHIKYU Operation

Structural Geology Observation Sheet

entered in Excel



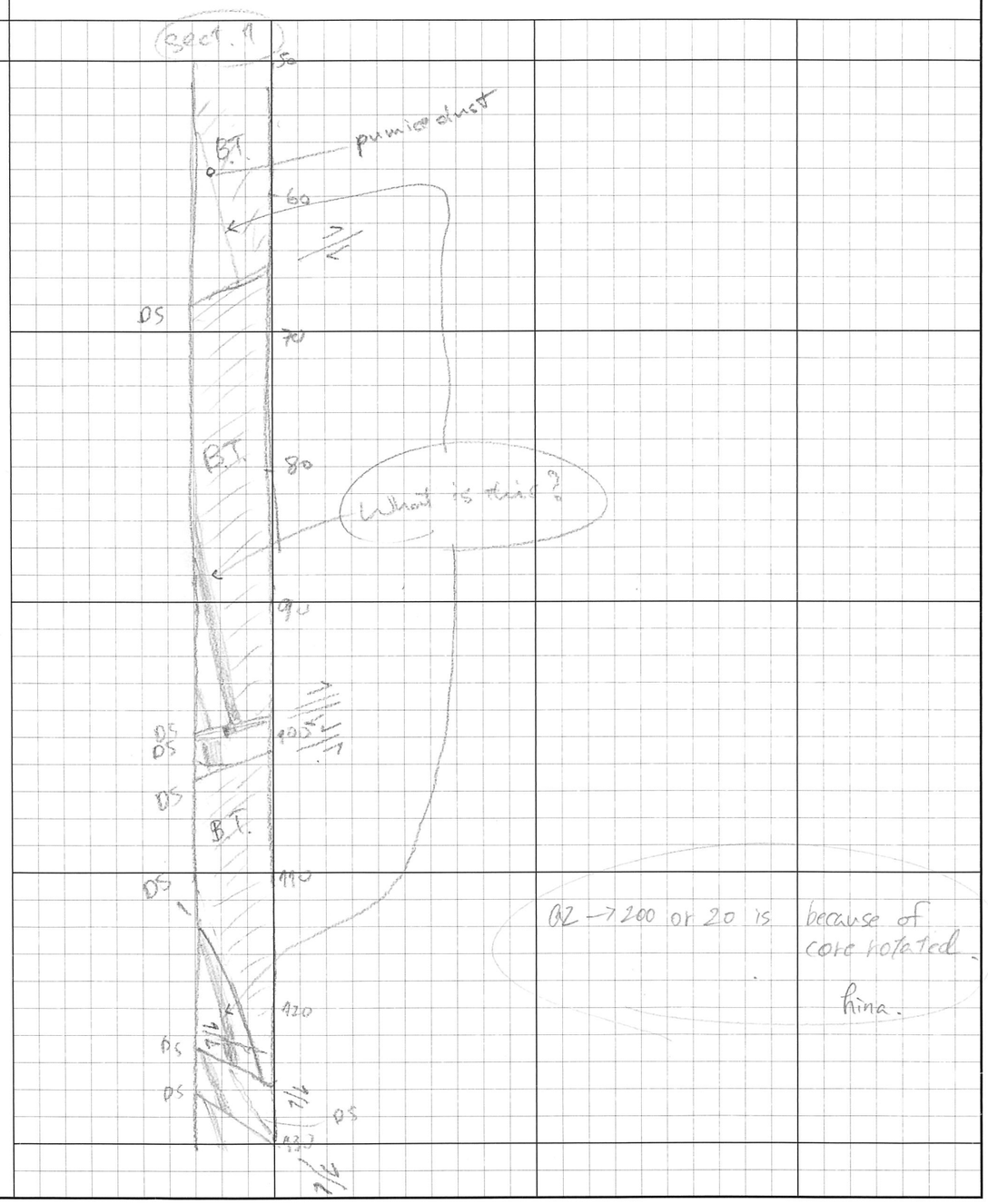
CT J

Core

No.

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 49K **Observer:** HO **Summary:** rotated about 20°..?

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Dark seam	0	12.5	270	70	200	29			0	136			
	"	19	21.5	90	30	200	8							
	"	32	36	90	38	20	45							
	"	35	37	90	21	20	14							
	"	60	64	90	31	20	47							
	Dark seam	44	~~64.5~~ 65.5	270	80	200	84	← ~~Bedding?~~						
	Bedding	54	65.5	90	75	200	80	← Bedding?	Dark seam?					
	Dark seam	65	67	270	20	180	41							
	"	81	84	90	25	180	21	~~← Bedding?~~						
	"	99	100	270	11	180	38							
	"	99	100.5	270	11	180	36							
	"	101	102.5	270	10	0	20							
	"	104	105.5	90	21	180	11							
	Bedding	87	99.5	90	80	180	61	← Bedding?	Dark seam?					
	"	114	125	90	70	180	57	← Bedding						
	"	116	125	90	75	180	60	← Bedding?	Dark seam?					
	Dark seam	123.5	125.5	90	23	180	39							
	"	126	130	90	35	180	15							



Q2 → 200 or 20 is because of core rotated.

hina.

CHIKYU Operation

J

entered in Excel

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 49K **Observer:** HO **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	Dark seam	19	27	0	60	90	36	CT	(the section was rotated by ~80° due to WRNO sampling)	~~0~~	~~15~~			
	"	25	35	180	62	90	70							
	"	49	50	0	10	~~90~~ 270	10			20	50			
	N. fault	71	72	90	13	0	14			70	142			
	Bedding	~~70~~ 70	~~80~~ 80	~~90~~ 90	80	326	0	← Bedding?						
	Dark seam	88	90	90	40	0	35							
	"	90	92.5	90	29	180	22							
	"	115	115	270	5	180	22							
	"	132	139	90	50	0	23							
	fault	138.5	139	90	5	0	14							Striations on the surface.
	fault	108.5	108.5	270	2	180	12							
3	Dark seam (fault)	28	38	90	70			70	90	7	48			
	"	58	61	270	40					56	65			88 - 100 chaotic structure.
	"	62.5	68.5	270	50					74	100			
	See 3 add													
New one. 4	Dark seam	0	3	90	30	180	33			0	140			
	Rev. fault (Dip)	18	19	270	20	180	15							
	Dark seam	37.5	40	270	20	0	8							
	"	70	71	90	8	180	21							
	"	80	84.5	90	30	0	28							
	"	111.5	111.5	90	0	180	31							
	"	115.5	119.5	270	34	0	10							
5	Dark seam	5	7.5	90	25	180	22			5	65			
	"	24	28.5	90	43	0	4							
	"	30	35	90	45	180	3							
	"	38	39.5	270	23	180	10							
		6	9	90	31	0	22							

High CT value bands.

entered in Excel

CHIKYU Operation

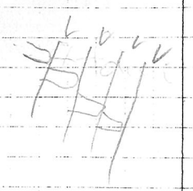
No.

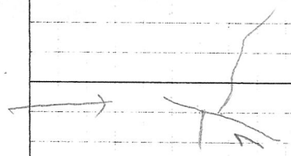
Structural Geology Observation Sheet

(J)

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 49K **Observer:** HH. **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
3	fault.	28.	39	90.	75	180	73			17	48			
A	dark seam	62	69.	270	46.	175	0							
d	fault, Normal	61.5	64.	90	22	180	22							
4	dark seam	26.5	28	90.	8	180	9			56	65			
	fault (~~d~~).	86.5	88.5.	270.	24	0	32							
	bedding	78	80.	90.	48.	140	0			74	100			
	fault.	93.5	94.5.	90	10	0	12							
	fault.	91.5	94.5.	90	37	0	8							
	fault	98.5	99	90	9	180	2							
	fault.	97	97.5.	270.	10	180	65.							
	fault.	24.5	25.5.	270	11.	180	9							
	fault, Normal	59	62	90	22	180	31							
	〃	77	81	270	68	350	0							





CHIKYU Operation

entered in Excel

No.

Structural Geology Observation Sheet

Exp.: 405 Site: C0019 Hole: J Core: 49K Observer: Y.H. Summary:

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note			
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip				
4 Add	N. fault	2	7	90	41	180	45										
	Dark seam	6	7	90	9	180	10										
	N. fault	7	17	270	62	0	45										
	"	13	18.5	270	48	0	24										
	Bedding	29	35	90	41	180	48										
	N. fault	32	38	270	46	0	24										
	"	34	36	270	25	0	29										
	Dark seam	51	53	270	19	180	22										
	"	52	53	270	14	180	8										
	Fault.	55	62	270	51	180	26	5	270								
	Dark seam	58	65	270	40	180	44										
	Rev. fault	91	98	90	67												
	fault.	114	116	270	12	180	8										

entered in Excel

CHIKYU Operation

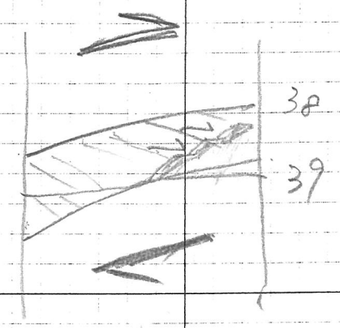
No.

J

Structural Geology Observation Sheet

Exp.: 405 Site: C0019 Hole: J Core: 49R Observer: YH. Summary:

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
5	Dark seam	11	15	270	31	180	19			5	65			
	Rev. fault	18	24	270	70	180	22							
	Dark seam	39	41	270	18	180	16							→ Def. zone.
	〃	40	43	90	39	0	45							
	〃	41	44.5	90	38	0	40							
	Bedding	30	32.5	270	32	0	19							
	Fault (dip)	45	56	270	60	0	67	44	270					



CHIKYU Operation

IMPORTANT →

Structural Geology Observation Sheet

☆ dark seam = def. band!

No.

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 50 **Observer:** KS + AF + HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Bedding	35.5	41	270	40	180	23			0	94			
	fracture	42.5	44.5	270	9	0	57							
	〃	59	59	270	7	0	51							
	Bedding	60.5	67	270	44	180	32							
	〃	65.5	71.5	270	45	180	53							
	〃	69	75.5	270	47	180	41							
	fracture	73	77	270	40	0	17							
	Bedding	74	80	270	42									
	normal fault	90.5	94	90	24	180	68							
	Bedding	89	95	270	45	180	02							
2	fault?	3.5	7.5	90	41	180	66			0	88			
	dark seam	8	11	90	30	180	09							
	〃	16	16	90	2	0	17							
	fracture	37	38	270	10	0	7	90	41					
	dark seam	42	43	270	13	0	19							
	〃	49.5	50.5	270	09	180	07							
	〃	52	52	90	1	0	10							
	fault	95	97	90	10	0	5			88	105			→ 2nd in CT?
	fracture	16	18	90	25	180	22			0	88			
	〃	20	23	90	24	180	9							
	bedding	35	39	90	28	0	38							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 50 **Observer:** KS+AF+HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	dark seam	102	105	270	20	0	26			88	105			
	fault	99	103	90	35	180	10							
	fracture	60	63	90	26	180	30			0	88			
	N. fault	63	72	90	60	342	0							50 mm offset
3	dark seam	9	9.5	90	12	180	14			7	37			
	"	11	12.5	270	14	180	5							
	"	18.5	21.5	90	31	180	33							
	Bedding	20	23	90	32	180	23							
	N. fault	22	30	270	80	0	0							
	Bedding	28	32	90	31	180	24							
	dark seam	49	51	90	22	180	31			47	58			
	bedding	53	56.5	90	37	180	21							
2	def bands	38.5	39	90	40	0	13			0	88			
	"	39	41	~~270 31~~ 90	14	0	21							
	"	39.5	40.5	270	18	6	23							
	"	42	42.5	270	11	0	11							
	"	44	44.5	270	4	180	26							
	"	45.5	49.5	90	38	180	3							
	"	48	48	270	8	0	5							
	"	49	49	270	10	0	4							
1	def. band	50	54.5	90	41	180	6							
	"	51	54	270	31	180	48							

See 4 coherent interval 4-26.6

Biscuit 16-18.3

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 51 **Observer:** KS + AF + HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	fracture	67	67	90	2	0	22			62	72			
	dark seam	65.5	67	90	16	0	27							
	fracture zone	0	61											3→12 cm blocks with no preferred orientation
2	~~Bisquit~~ dark seam	10	13	90	28	10	14			0	13			
	fracture zone	13	52											drilling disturbed blocks ~ 10-15 cm length
	BISQUIT	93	111											
	"	111	128											
	"	128	140											
cc	drilling disturbance/ bisquits													
1	Def. band	5	15	90	65	48	0			5	20			
5	〃	6	12	90	52	180	48							
	〃	9	10	270	37	0	25							
	〃	10	12	290	60	0	32							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 52 **Observer:** AF **Summary:** Def Bands

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Bedding ~~Dark seam~~ def band	11	14	270	26	0	30			9	25			
	Bedding ~~Dark seam~~ def band	~~80~~ 14	~~21~~ 17	~~270~~ 270	~~30~~ 25	~~0~~ 0	~~82~~ 8							
	Fracture	59	63.5	90	40	180	62			53	82			Striations?
	"	76	82	270	45	180	5							
	def band ~~Dark seam~~	82	82.5	270	6	180	45							Striations
		17	20	90	29	180	30			9	25			
	Fracture	16	26	270	58	3	0	34	90					
	"	71	78.5	270	50	180	61			53	82			
	"	84	89	270	37	180	22			83	108			
	Bedding def ~~Dark seam~~ band	~~92~~ 92	96	90	30	60	0							
3	def band	9.5	11	270	15	180	19			2	30			
	"	20	25	90	40	180	20							
	"	31	37	270	57	180	21			30	40			
	fault	31	42	90	62	180	35							offset def band by 1cm
	def band	2	4	270	76	180	29			2	30			
	"	74.5	76	270	10	180	10			72	78			

~~42 46 090 30 60~~

~~11 44 278 26 60~~

CHIKYU Operation

+YY+CR

Structural Geology Observation Sheet

No.

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 52 **Observer:** KS+AF+HS **Summary:** Def bands

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	deformation band	25	30	270	43	0	5			3	20			
	〃	30	31.5	90	14	0	5			21	35			
	〃	32	37	90	46	0	30			35	75			
										75	90			
	〃	40	43	270	35	180	27			90	110			
	fracture	32	49	270	60	357	0							
	〃	49.5	49.5	90	0	180	26							
	def. band	51.5	53.5	270	21	180	43							
	fracture	55.5	59	270	33	0	4							
	def band	61	62.5	90	12	180	39							
	fracture	62	66	270	35	180	42							
	BISQUIT	75	90											
	deformation band	22	26	270	44	0	41							
	def. band/ bedding	2	6	90	44	180	2							
	〃 〃	10	13	90	36	180	13							

CHIKYU Operation

32
40

No.

Structural Geology Observation Sheet

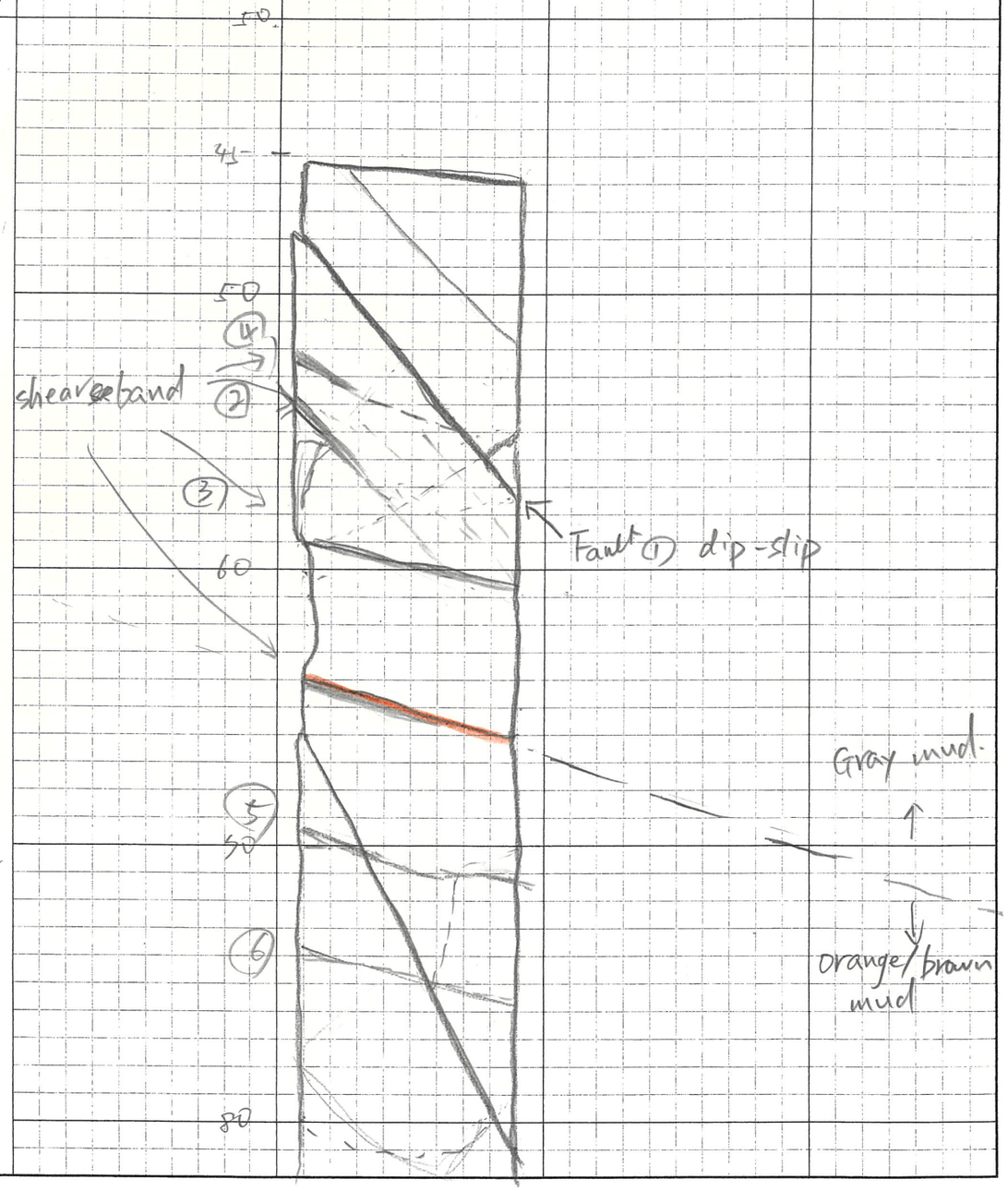
Exp.: 405 Site: C0019 Hole: J Core: 53K1 Observer: Y.Y., C.R. Summary: 45-79cm STRUC

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Fault (Lithologic boundary)	64	66	250	24	300	0							
	Fault ①	48	58	250	54	349	0							
	shear band ②	52	54	250	59	305	0							
	" ③	59	60	250	16	307	0							
	" ④	52	54	250	33	324	0							
	" ⑤ (faint)	68	70	250	29	304	0							
	⑥ (faint)	72	75	250	20	291	0							
	fault ①	48	58	270	58	348	0							
	shear band ②	52	54	270	54	352	33 0							
	" ③	59	60	270	14	319	0							
	" ④	52	54	270	30	0	33							
	" ⑤	68	70	270	25	296	0							
	" ⑥	72	75	270	13	290	0							
☆	Fault (litho boundary)	64	66	270	25	302	0	87	270					

measured on CT

switched?

measured on split surface



CHIKYU Operation

No.

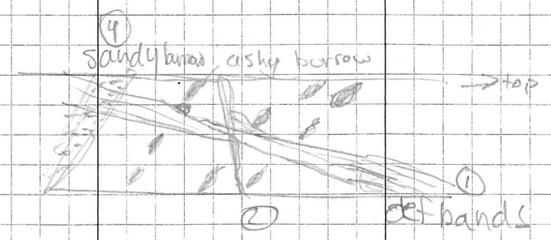
Structural Geology Observation Sheet

↗ Structure whole round sample

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 53 **Observer:** YY+CR **Summary:** Upper contact (fault?) w/ red-color mud

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	def band	21	22.5	90	8	180	45			19	45			
	"	24	34	90	80	0	25			78	90			
										97	107			
	fracture thrust fault?	38	40	270	31	0	49	39	270					
	def band	45	42	270	25	0	29							
	" "	85	90	270	75	11	0							
	" "	88	90	270	49	180	19							
	" "	84	90	90	45	0	68							
	fracture	82	84	90	21	0	62	36	270					
3	Biscuitting	44	73							27	44			Coherence questionable above core catcher
	fault	40	43	270	41									
	def. band/bedding?	38	40	90	20									
	fault	32	38	270	38									
	fault	25	35	270	32									
2	def band.	10	10.5	90	90	180	39			0	98			
	bedding	17	29	90	63	25	0			98	142			
	fracture	36	39	90	25	180	45	33	270					
	bedding	60	72	90	60	20	0							
	fracture	75	78	270	30	180	47							
	def band ②	76	94	270	66	0	55							
	" " ③	83	85	270	10	180	22							
	Fractured	129	134	90	45	180	47	90	270					

ashy bioturb ①
sand bioturb ④ or swapped w/ ③



1 structure whole 45 78
Round

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 54 + 55 **Observer:** YY+CR **Summary:** ~~Disturb~~ soft sed def, red along steep bedding, def bands

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	def. band/ fault	5.5	7.5	270	36	180	12			0	39			
	"	11	13.5	270	32	0	15			40	59			
	"	24.5	28	90	29	180	50			60	71			
	"			90	21	0	4			91	106			
	soft sed def.	29	31							114	125			
	~~[illegible]~~	30	62											
	bedding	39	56	270	71	18	0							
	def. band	62	66	270	36	0	12							
	fault	95	97	270	28	180	54	35	90					
	def band/ fault	101	105	90	35	0	11							size: 2x1cm, thickness: 10cm, no pref orient. spacing: irregular
	fractured interval	101	119											
	def band	121	124	270	25	180	13							
2	fractured interval	8	108							8	90			size: 0.4x0.4cm, upto 5.5x6cm, 1m thickness, spacing: variable 1-5cm
	rep fract 1	36	38	90	17	0	29			maybe biscuit @ 43cm – 53				
	" " 2	74	84	90	55	180	54							
	bedding	76	80	90	61	31	0			(8	43)			unsure continuous, def band?
	rep fract 3	15	20	270	45	0	60			(53	90)			

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 55k **Observer:** YY. CR. **Summary:** fault/fractures

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Fault	7	8	250	9	0	20	65	90	0	16			
〃	〃	20	22	250	20	0	4	84	90	16	57			
〃	N. Fault	45	57	250	53	12	0	34	250	〃	〃			
〃	bedding (burrow)	68	86	90	72	12	0			65	102			
〃	〃	75	88	90	62	12	0			↓	↓			
〃	N. Fault	80	94	90	68	32	0	10	90					
2	N. Fault	14	22	90	52	21	0	4	90	0	38			
〃	〃	79	96	250	75	357	0	5	270	38	125			
〃	〃	83	117	250	84	2	0	10	250	〃	〃			
3	Fracture zone	14	36							0	48			~~0.5~1cm fragment, aspect ratio 1~2, no preferred orientation.~~
〃	〃	36	53											0.2~0.5cm fragment 〃
〃	〃	53	69											0.5~1cm fragment 〃
										48	93			
4	Fracture zone	0	5							3	88			~0.5cm fragment, aspect ratio 1~2, bit disturbed
〃	〃	5	22							88	126			~1cm fragment 〃 1~3 no preferred orientation
〃	〃	22	36											
〃	Fault	50	59	90	62	293	0							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 55 **Observer:** YY+CR **Summary:** fault/fractures

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
5	fractured zone	0	50							0	55			~3.5cm frag, ~2 cm zone of ~0.5cm, no pref. orient., irregular spacing
"	"	50	66							71	125			~0.5cm frag, no pref orient, irregular spacing
"	fault	100	103	90	31	180	51							
"	bedding	94	100	270	60	16	0							maybe bioturb
"	fault	110	115	270	45	0	50	29	270					
"	fault	117	119	90	14	0	22	17	270					
"	fractured interval	71	89											bit drilling disturbed
"	" "	82	126											2x3 cm frag, irregular spacing
2	fault (brecciated) zone	102	109	90	55	180	20		38	125				~1mm scaly fabric
		93	128											2:1 aspect ratio clasts long axis elongate along fault plane ← pref. orientation. spacing ~0.5cm
	fault (seen in CT)													might be hard to measure in core

CHIKYU Operation

Structural Geology Observation Sheet

No.

5 3K upper contact
5 6K lower gouge
red brown mud
Struct whole rounds

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 55 **Observer:** KS + AF + HS **Summary:** calcite! fractures, dark seams

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
6	fracture	3	6	270	27	180	36			0	19			
	dark seam / fracture	66	67.5	90	18	0	6			52	107			
2 4?	fracture	54	57.5	90	26	0	66							
	dark seam	66	67.5	90	21	180	3							
	fault	88	88.5	270	3	0	37	18	90					def band offset
	def. band	87.5	89.5	90	16	180	3							
	"	86.5	86.5	270	1	180	9							
	"	85	87	90	13									
	fracture	98	104	270	41	54	0	19	270					
	"	90.5	102	270	65	357	0							filled w/ scaly fabric (7mm)
7	fracture	3	9	270	42	0	27			0	20			
	"	17	21	270	39	0	41							
	N. fault	27	47	90	66	65	0	15	270	20	67			
	thrust fault	49	61	90	60	318	0	26	90					
	fracture	58.5	63	90	24	0	51	16	90					
	calcite chunk	19	20											

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 56 **Observer:** KS + AF + HS **Summary:** fractures

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Heavy frac	0	14	—	—					0	49			No preferred orientation ~1cm sized fragments
"	mod Frac distrb	14	22	~270	no preferred dir									2-3cm sized fragments. Fracture spacing 2-4cm Mostly to 270 but variable dip
	Frac	16	20	270	41	curves								
	Frac	20	23	270	20	0	32							
"	Intact chunk	22	27							22	27			Fractured on top/bottom and edge by core liner
"	Heavy frac	27	56	~90	~50									Too small fragments for 2nd measurement 1cm and less
"	slight to mod Frac	56	140	~270						49	140			2-6cm sized fragments: 61-104 ~~mod~~ slightly disturbed 2-4cm frac spacing 270/30-50 <1cm-2cm fragments @ 105-118 mod dist one long 270 fracture (69 dip) Frac spacing 1-2cm
	Fracture	66	70	270	30	0	4							
		72	72	90	9	0	30							
		75	87	270	59	0	51	20	270					
		85	91	90	27	0	62	50	90					2-4cm fragments 118-140 slight disturb 1-3cm frac spacing ~~270 strike~~ No preferred orient?
		95	102	270	53	0	0	29	90					
		101	107	270	49	0	31							
		104	110	270	35	180	55	68	90					
		108	121	270	69	323	0							
		125	127	270	19	0	21							
		129	132	90	31	0	9	28	90					
		133	133	270	5	0	0	32	90					} rounded tops, near horizontal fractures
		136	137	270	6	0	10	33	90					
	Bedding	93	99	270	41	180	12							Not apparent, bumows roughly 270/30-40

Striations

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 56 **Observer:** KS+AF+HS **Summary:** fractures

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	mod to heavy frac	0	16	~270	~50					0	16			Preferred frac orientation 270/40 2cm fragments down to less than 1cm <1cm frac spacing
	slightly disturbed	16	40							16	40			
	frac	16	16	90	5	0	21	35	90					No preferred orientation. Maybe conjugate frac sets
		14	27	90	68	296	0							
		23	28.5	270	40	0	10							
		27.5	28.5	90	14	180	15							
		29	38	270	46	180	59	42	90					
		36	44	270	52	0	60	12	90					NO burrow offset
	Bedding	26.5	33	270	49	0	45							NO apparent planar bedding. Bioturbation/burrows 270/40(ish). NO bed/burrow offset by fractures
3	mod disturb	0	65							0				
	fracture	2	6	90	31	180	39							
	Normal Fault	5	14	270	49	295	0	0	90					Bedding/Burrow offset
	Fracture	16	22	270	35	180	38							
	Fracture	23	27	270	32	180	48				32			
	competent clay seam? Gouge?	34.5	36.5	90	18									
	Normal fault	35	45	90	55	0	23			37				Burrow/Bedding offset
	fracture	47	49	270	20	0	42				65			
	"	56.5	63.5	270	51	0	26							
	Heavy disturb	65	89											Burrows/Bedding within but can't trace anything to get sense of movement
	Bedding	77	77	may be horizontal bed/burrow within very fractured stuff										
4	0-27 very fractured. soupy/clayey very soft													

CHIKYU Operation

60.5–117.5

Structural Geology Observation Sheet

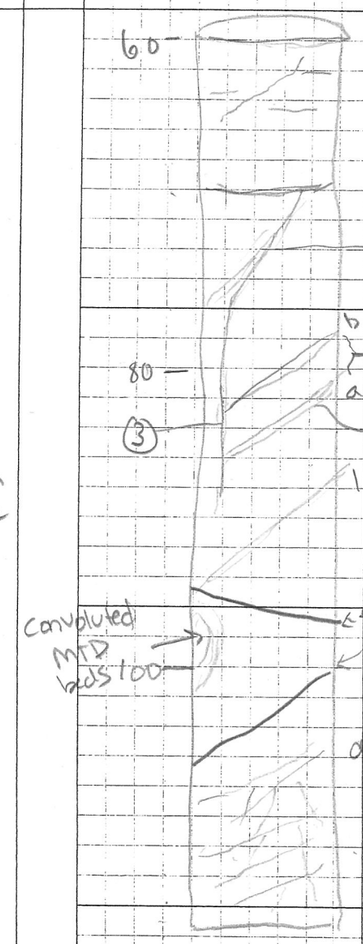
find rep dark seam

No.

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 56K-5 **Observer:** YY+CR **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole	
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip
5	N. fault ①	60	66	270	56	0	55	measured in CT					
	dark seams ②	69	80	270	73	0	341						
	" (steep) ③	75	87	270	84	90	0						
	" 4a	76	86	270	58	180	72						
	" 4b	78	83	270	47	0	308						
	⑤	86	96	90	60	180	36						
	" ⑥	103	111	270	55	180	30						
	①			270	56	348	0	0.5m offset		measured on split core			
	②			270	67	0	304						
	③			270	84	90	0						
	4a			270	56	faint							
	4b			270	43	180	20						
	⑤			90	55	180	29						
	⑥			270	41	180	39						

Note



CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 56 **Observer:** HS, AS, KS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
5	Heavily Disturbed Zone	0	2											Red-brown, soupy
	Moderately Disturbed -breccia	2	10											Red-brown, shiny striated planes, foliated
	Moderately Fractured Clast	10	17											olive-greenish brown, spacing 1~2 cm, de-gassing bubbles
	Foliated Gouge	17	26											red-brown, potentially scaly fabric, fragment size < 4mm, clayey
	Highly Fractured Clast	26	31											olive-greenish brown, shiny striated blocks, fragment size 5~15 mm
	Heavily Fractured Clast	31	41											olive-greenish gray, fragment size <5 mm
	Heavily Disturbed Breccia	41	45											dark brown, degassing bubbles, fragment size <8 mm
	Fractured Clast	47	50											light gray, fragment size < 8mm
	Disturbed Fault Breccia/Gouge	50	54											light gray, slightly-opened fault-parallel cracks 1~3 mm spacing
	Disturbed Cataclasite or Disturbed Gouge	54	56											~~light gray fragments, some dark gray-black fragments from below, frag. size <5mm thickness 1.5cm~~ dark gray-black, thickness ~8 mm, foliation parallel to disc visible working half side detached from footwall and tilted but archive side likely intact
	Foot wall	56	113											gray to dark gray mudstone

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 56 **Observer:** KS + AF + HS **Summary:** fractures, burrow bedding, dark mud

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
6	Dark seams and fracs	0	30	270	~40					0	50			Dark seams roughly 270/60. very small interconnected
	Bedding? Burrow?	30	32	90	23					54	122			Dark wavy layer, not offset by fracs
	Dark seams (microcracks)	34	45	90	~72									cutting across bedding laminae, not offsetting
	Dark planar (Bedding?) feature	42.5	44.5	90	23									Not offset by fractures
	chunk w/ fracs and dark seams	56.5	Dark seam 60	90	30									Bedding may also be in 270 direction now less dark seams after this
	Fracture	10.5	14.5	270	35	180	69	62	270					
	Fracture	26	39	90	65	294	0							
	"	36	50	90	75	314	0							
	"	74	76	270	26	0	7							
	"	81	81	90	0	0	54							
	"	83	88	270	44	0	45							
	"	101	106	270	40	0	40							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 56 **Observer:** KS+AF + HS **Summary:** fractures

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
7	Mod disk	0	45							0	28			No preferred orientations 1-3cm size fragments 1cm or less frac spacing. ~~Approx.~~ Some microcracks/dark seams that are cracked.
	Top of Biscuit?	42	45							44	61			
	Slightly disturb	44	105											Mostly intact. 270/54 roughly preferred orientation 45-70 1-2cm spacing No preferred orientation 70+, more microfractures/dark seams
	Burrow Bedding	47	49	270										Not offset
	Dark Bedding or seam	59	59	270										
		59.5	60.5	270										Not offset
	Biscuit? Damage Zone?	61	72	270						61	71			Clay/muddy bounding more fractured and smaller fragment section. Lighter color goes up and down into this section (drilling mud?)
	Bedding	83	83.5	270	4					71	95			
	Fracture	82	93	90	60	0	62							
	Fracture	48	57	270	57	356	0			44	61			
		30	38	270	56	180	62			28	42			
C6	Heavy drilling													
	Maybe Bedding													

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 57 **Observer:** KS + AF + HS **Summary:** fractures, bedding

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	frac	90	93	90	14	180	22	72	90	5	74			
	"	103.5	106	90	17	180	64	86	90					
	frac zone	5	6.8											2-7cm
	"	15.5	16.5	270	12	180	46							
		27.5	29	270	13	180	80							
	Bedding	73	80	90	66	31	0							
	det band	25	35	90	75	22	0							
		20	34	270	84									
		23	35	90	63	15	0							
	fracture	134	140	90	62	50	0			74	141			

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 57 **Observer:** KS + AF + HS **Summary:** fractures, bedding

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	frac	4	6	90	16	180	28	70	270	0	27			
	"	7	11	90	34	180	52							
	frac zone	0	87											→ 2 preffered orientations, 3-6 cm spacing 270/20 and 90/15
	"	18.5	20	90	13	180	47							
	"	22.5	25	270	18	180	42							
	"	34	36.5	270	20	180	16	56	90	27	84			
	"	45	47	90	19	180	58	67	270					
	fracture	62	83	90	74	58	0	9	270					
	"	85	94	270	57	310	0	10	270	84	126			
	"	99	108	270	55	51	0							
	"	115	123	270	56									
	T. Fault	91	98	90	65	28	0							
	"	91	95	90	73									
	Bedding	6	24	270	83	25	0			0	27			
	"	6	25	270	81	26	0							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** 57 **Core:** J **Observer:** KS + AF + HS **Summary:** bedding, fractures, darkseam/def band

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
3	frac	38	39.5	270	15	180	43			0	108			
	"	58.5	59.5	270	8	180	52							
	"	69	70.5	270	10									filled ~1mm dark seam
	dark seam	42.5	43.5	270	13	180	08							
	"	49	50.5	270	14	180	41							
	"	51	52	270	12	180	22							
	"	44.5	46	270	26	180	42							
	Bedding	49	51	270	16	180	41							
	"	53	54.5	270	14	180	37							
	frac	0	7.5	270	51	322	0	10	270					
	"	10.5	17	270	46									
	"	6	13	270	52	180	44							
	def. band	32	36	90	37	180	46							
	"	32	36	90	34	180	52							
	bedding	36	38.5	270	17	180	30							
	def band	72.5	73	270	7	0	3							
	"	72.5	72.5	270	9	0	2							
	frac	74	80	90	51	0	64							
	"	83	87	90	43	180	61							
	"	89	99	90	60	296	0	~~61~~	~~90~~					

Bedding 79.5 80 270 13 180 39

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 57 **Observer:** KS + AF + HS **Summary:** fracture, bedding, dark seams

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
4	Frac	3	9	90	53	39	0	19	270					N. Fault sense in dark seam/microfracture with offset (possible bedding) ← doesn't go all the way across core to measured fault (below?) 180/42
	" "	10	13	90	28	180	45	37	270					
	Dark Seam	14.5	17	270	22	180	30			0	64			Microcracks near vertical in top of core, Slight +90 orientation
	Fracture	15.5	20	270	40	0	0							
	Dark Seam "Bedding"	23.5	26	270	21									
		28	29.5	270	19									
	Fracture	41.5	46.5	270	46	180	38							
	Dark Seam	48	53	90	60									Deformation Band
	Frac	71	72.5	90	15	180	22			64	77			
	Dark Seam	72	77	90	45									Dark Band
	Bedding	101.5	102	90	6	0	7			77	133			
	Fracture	92	106.5	90	70									
	dark seam	121	125	90	33									
	Frac	125	133	90	54	0	38	85	270					
	Anastomosing dark seams	113	119	} couldn't see in 2nd plane very faint										
		77	89											

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 57 **Observer:** KS + AF + HS **Summary:** bedding, fractures, dark seam/ def band

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
5	fracture	5	7	270	23	180	47	62	90	0	95			
	dark seam	8.5	13	90	34	0	27							
	bedding	10	15	90	35	0	25							
	fracture	10	11.5	270	15	180	44	270	66					
	Bedding	33.5	38	90	38	0	12							
	defiband	34.5	39	90	37	0	21							
	Frac	39	43	90	33	90	13							
	"	45	50	90	38	0	66	64	90					
	"	65	77	90	57	55	0							
	Bedding	68	72	90	33									
	"	82.5	87	90	42									

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** 6019 **Hole:** J **Core:** 57 **Observer:** KS + AF + HS **Summary:** fractures, dark seams, small offsets

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
6	Frac Zone	0	19	90	46					0	106			regular 2cm spacing, 2cm x 7cm fragments w/ some microcracks
	Frac	2	6	90	46	180	70	20	270					
		35	38	90	40	0	23							
		27	35	270		180	35	70	270					
	Bedding	29	32	90	30	0	32							
	Dark Seam (Bedding)	23	28	90	41	0	31							
	Fracture	47.5	52	270	25	0	49	47	270					
	" "	63.5	65.6	270	22	0	29	76	270					
		68	70	270	19	180	11							
	Frac Zone	27	80	270	~20									Fracture spacing 4-14cm large intact chunks with dark seams parallel to bedding
	Frac	117	124	270	50					117	131			Mod fracture 114-131 No preferred orientation Biggest fracture 270/50 Bedding 90/40

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** 57 **Core:** 57 **Observer:** KS+AF+HS **Summary:** bedding, fractures, dark mud

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
7	Bedding	2	8	90	38	180	36			0	29			
		0	4	90	38	180	40							
	Fracture	19	24	90	45	0	4	31	90					
	Dark seam	21	25	90	35	180	60							
	Bedding	31	36	90	40	0	20			29	57			
	Fracture	37	37	90	2	0	15	17	90					
	Fracture	44	54	90	63	0	50	41	270					
	Fault	54	59	90	48									Truncated sandy beds/litho above and brown/dark muddy bed below
	Fracture	72	75	270	37	0	5			57	92			
	Fracture	78	84	270	40	0	2							
	Dark seams	86	90	90	42									
	Dark seams	88	90	90	28									
	Frac zone	59	91	270	direction									
	Frac zone	18	59	90	direction									

CHIKYU Operation

No.

check these

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 58K **Observer:** YY+CR **Summary:** steep bedding & fractures

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	fracture	15	19	90	31	180	76			4	132			
	bedding	5	11	270	57	37	0							
	dark seam	66	66	270	2	180	10							
	fracture	65	71	90	43	180	43	33	270					
	fracture	81	84	270	40	180	15	40	270					
	small slump folds	99	101											
	micro faults	85	89											
	fractured zone	104	127											size ~3 cm 2:1 aspect ratio elongate in fracture orientation similar to @ 81-84 cm spacing ~ 2cm
2	fault	18	26	90	68	180	17			0	16			
	fractured interval	0	39							16	40			~ 2cm frag, irregular spacing ~3cm, pref. orient (2:1 aspect ratio) this fault
	" "	39	49							40	117			~1cm frag spacing: 1cm, similar orient
	fault	59	69	90	61	180	61			117	148			
	fault	73	85	90	58	180	30							
	dark seam	55	60	90	40	180	40							
	fault	90	94	270	36	0	74							
3	light laminations w/ micro faults	3	13							0	10			
	thrust fault	14	17	270	26	180	29	79	270	10	122			
	fault	25	32	270	52	180	20							
	bedding	68	75	90	53	0	35							
	" w/ burrows	114	119	90	63	6	41							
	fracture	101	108	90	51	0	15	28	270					
	fracture	94	100	270	55	180	42							
	fracture	87	97	96	54	0	1	20	0					
4	convoluted/folded bedding → MTD?	14	20							0	125			
	fracture	30	35	270	42	180	35	23	270					
	"	42	46	90	24	180	34	38	90					
	"	64	74	270	63	180	25							
	dark seams	82	86	270	11	0	9							
	fracture	112	113	270	16	180	10	30	90					
	fracture	54	54	270	5	0	29	87	270					

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 58 **Observer:** YY+CR **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
5	dark seam	17	20	270	26	180	6			0	113			
	fracture	23	28	270	46	180	35							
	fracture	60	60	270	2	180	38	21	90					
	fault	83	86	270	36	180	7	23	270	76	145			offsets dark seam/def band, bioturb above
	fault	100	100	90	30	180	27							
	bedding	100	104	90	65	0	62							
	fracture	112	112	270	9	180	54	45	90					
	fracture	121	135	270	62	0	78	51	90					
	fracture	127	137	90	75	180	45	26	90					
6	fracture (reverse)	6	16	90	46	0	42	90	90	0	132			
	" (reverse)	19	30	90	63	0	43	90	90					
	"	47	56	270	53	0	19	39	270					
	fault	59	69	270	46	0	35	30	90					
	fault	83	109	270	70	0	41							
	fracture	113	121	270	44	0	65	51	270					
7	def. band	7	7	90	4	0	12			0	32			offsets steeply dipping green laminations ~1cm
	def band	24	30	270	50	0	46			37	73			
	smear in ashy layer?	38	39							75	96			
	bedding	11	19	270	55	10	0							drilling induced?
	def band	40	41	270	16	0	4							
	bedding	58	60	270	30	0	20							
	bedding/ litho contact	71.5	71.5	90	90	0	31							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 Site: C0019 Hole: J Core: 59K Observer: Y.Y. C.R. Summary: calc-green

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	laminae (flow struct)	15	34	90	13	36	0			15	34			
2	N. Fault	42	54	250	57	21	0			28	88			Muddy MTD? block-in-matrix texture, cut by small-scale ft. shear along clast (mostly normal fault sense of shear)
4	R. Fault (originally N. FT?)	51	65	90	82	9	0							
4	N. Fault	36	88	250	69	4	0							
3	N. Fault (along clast)	22	29	90	51	332	0	19	90	8	109			
4	Fault	46	56	90	67	304	0			0	68			
4	bedding	52	58	250	68	26	0			4	4			

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 60 **Observer:** YY+CR **Summary:** pref. orient. frac set

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	fault	5	14	90	54	180	12			0	116			
2	fractured interval	25	116											best ex of spacing=regular ~1cm, all same pref. orientation
		53	54	270	41	180	15							
		94	98	270	37	180	18			0	69			
2	def band	3	9	90	39	44	0			95	119			
	"	30	37	90	46	180	13							
	fracture	46	46	270	10	180	26							~1cm set, same pref orient for 39-55cm
3	def band	4	10	90	48	180	28			0	89			
	def band	45	50	90	35	180	24							
	fracture	35	40	90	35	180	22							
	"	52	57	90	46	180	55			96	106			

"this whole prism is totally fucked" - Structure VCD

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 61K **Observer:** YY + CR **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	fracture	39	41	90	18	0	65	90	90	34	132			
	fracture	41	54	90	71	19	0							few mm dark seam alteration around it
	fracture	63	75	270	54	0	39							
	"	79	81	270	15	180	65	20	90					
	"	90	100	90	62	180	35							
	"	112	116	90	32	180	12							
3	fracture	13	15	90	15	180	20	85	90	0	5			
	"	37	47	270	57	180	34			6	131			along dark seam
	"	92	95	270	31	180	39							
	"	112	131	270	75	180	74	23	90					
4	frac zone	10	39							0	179			0.8cm spacing, spherical 1:1 ratio, no preferred orientation
	fracture	47	54	270	52	180	45							
	"	58	60	90	15	0	43							
	"	99	106	90	47	180	43			90	134			
	frac zone	100	135											2-4cm spacing, no orientation pref.

Stration step shear sense convention

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 62 **Observer:** KS, Af, HS

Summary: Grey mudstone, no bedding, structureless, regular fractures. MTD. ~~[illegible]~~ Normal shear Fractures identified by Striations

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	~~[illegible]~~ Frac	17	25	270	50	343	0	26	90	16	78			~~[illegible]~~ Fracs, Slickenlines indicates reverse motion. No offset in bedding because bedding structureless/not visible. 270/40 orientation
	" "	32.5	39.5	90	55	36	0	33	270					
		40	46.5	270	44	313	0	41	90					
	~~[illegible]~~ Frac	59	62	270	25	180	63	45	90					
	" "	69.5	73.5	270	36	180	15	26	90					
	~~[illegible]~~ Frac	30	38	270	42	335	0	40	90					Color difference between blocks, plus striations
2	~~[illegible]~~ Frac	21.5	23.5	270	19	180	29	32	90	0	66			~~[illegible]~~ sense from striations
	" "	23	25	270	16	0	12	29	90	73	118			
	" "	27.5	29	270	9	180	46	45	90					
	" "	30.5	32	270	8	180	18	32	90	119	129			
	~~[illegible]~~ Frac	15	23	270	51	29	0	23	90					
	Frac zone	0	108											Slightly frac. 270/15-50 orientation. 3-5cm long Blocks. Frac spacing 3-5cm. 270/~50 are more frequent
	~~[illegible]~~ Frac	48	53	270	38	0	23	14	90					
	Fracture	52	60	270	48	348	0							
	High angle Fracs	72	98	270	73	332	0							
	Dark seams (Slut)	91	98	90	21									Beneath high angle frac that may disturb bedding/bounds. Shallower angle than frac (and different orientation)
				90	25									
				90	22	180	32							
3	Frac interval	0	81							0	83			mod to high dip fracs. All dip 270/~40 or 270/75. 4-10cm frac spacing. Fissile chunks
	Frac	9	46	270	80	292	0							
	" "	56	82	270	73	315	0							
	" "	32	36.5	270	38	180	27							
	" "	42.5	49	270	52	356	0	42	90					Stration, no sense of direction

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 62 **Observer:** KS, AF, HS **Summary:** Mass Transport Deposit dominate. No preferred frac orientation. Some bedding/bioturbation visible and offset

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
4	Def Bands	28	52							19	69			Truncating sid features, truncating themselves. Noted by mm thick dark seams. Fissile bedding/deformation
	Dark seam	37	38	90	13	0	0							
	" "	38	44.5	90	66	334	0							Truncated by top and bottom seam
	" "	44.5	47	270	23	180	18							Dark seams truncated bedding/binows
	" "	35	38	90	47	0	32							
	Fracture	52.5	57	90	38	180	4							
5	MTD	0	114											
	Normal Fault	87	99	270	45	47	0			0	111			Offset dark seam, truncating sand bedding above 2cm. No direction sense.
	Fracture	63	70	90	53	0	48	36	90					
	Fault	10	24.5	90	67	310	0							offset bedding/bioturbation
6	Frac	24	25	270	10	180	60			0	37			At color change (lighter green to darker brown) Darker seam
	Frac	50	52	270	20	0	67			37	99			
		73	79.5	90	50	45	10							
		83	90	90	48	61	0							
	High angle	83	97	90	71	340	0							Possible
CC														

Age reversal between 62-63
(2.7-4 Ma) (2-2.5 Ma)

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 63 **Observer:** KS, AF, HS **Summary:** fracture, dark seams, MTD(s)? calc

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Fault zone?	0	30							0	134			Deemed a community structure to be preserved/sampled due to age reversal and concentrated biscuit zone
	Top	10	19.5	270	58									
	Bot	13	24	270	64									
	Dark Seam	25.5	26.5	90	6									
	Frac zone	48	134	90	55									
	Rep. Fracs	48	55	90	54	312	0							Slicks, unclear direction
	Frac	81	89	90	56	39	0	23	270					
	Def Bands	61	67	90	~40									Cross cutting dark seams
	Dark Seam	87	90	90	30	0	36							
2	Frac	16	19	270	18	0	54			0	73			
	Dark seams crosscutting	12	16	~90	~10									
	Frac	41	44	270	30	0	44							
3	Possible Bedding contact	68	69	90	5	180	9			0	47.5			
	Dark seam	9	11	90										Dark seam oblique to bedding? Near vertical bioturbation
	Dark seams	30	33	90										Dark seams oblique to bedding?
	High angle Frac	28.5	40	90	62	19	0	26	270					Thrust sense
	Fracture	116	121	270	40	0	16			47.5	126.5			
4	Calcareous Bit	0	9							0	109			
	Frac	13	15.5	270	28	0	6	30	270					
	" "	21	24	270	19	0	75	65	270					
	Bedding	31.5	33	90	16									
	" "	38.5	40	90	11	0	6							
	Fault	67	67.5	90	9	0	12							Bedding/Dark Seam offset
5	Fracture	22	33.5	90	57	8	0			16	35			
	Frac Zone	70	126	No preferred orientation						46	126			

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 64 **Observer:** HS, AF, KS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Moderately Disturbed	0	16											Cobbles with fractures but orientation lost by drilling
	fracture	14	18	270	30	48	0							
	fracture	21	32	90	59	324	0			11	40			
	fracture	22	26	270	40	50	0							
	fracture zone	22	40											
	fracture	38	52	180	75	85	0	~~[illegible]~~ 70	~~[illegible]~~ 90					striation
	fracture	54	60	270	30	~~64~~	0	38	270					striation
	fracture	71	85	90	73	69	0	~~[illegible]~~ 8	90					striation
	fracture	80	85	90	40	302	0							
	fracture	84	86	270	13	0	44	270	58	40	110			striation
	bedding	82	83	270	11	180	60							
	fracture	88	88	0	13	90	0	75	90					striation
	fracture	91	97	270	36	43	0							
	fracture	96	106	270	52	23	0							
	fracture	103	106	90	30	0	42							
	highly fractured zone	98	110											

62, 63, 64 — All MTD

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 Site: C009 Hole: J Core: 64 Observer: KS, AF, HS Summary: fracture + dark seams

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	Frac & lam on Dark Seam	14	16	90	25	0	45			0	117.5			
	Fracture	26	38	270	60	29	0							
	Fracture	35	50	90	68	13	0							
	" "	66	67.5	90	18	180	43	54	270					
	" "	67.5	70	90	23	180	52							
	" "	72	74	90	16	180	38							
	" "	76.5	78	90	17	180	39	36	270					
	" "	104	117	270	69	5	0							

Footwall side has numerous fractures 90/27 orientation that truncate at the fracture. 11 fracs 180/50 24/270 sticks

Striation step shear convention

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 64 **Observer:** KS, AF, HS **Summary:** Semi regular spaced and oriented fracs. Interspersed by conjugate larger or oblique fractures. Fissile structure of bedding, many intercrackers smaller. Frequent

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
4	Fracture	43	54	270	60	17	0			0	148			
	Dark seam	66	68	270	21	180	15							
	Fracture	80.5	83.5	90	34	130	7	81	90					Striations give normal sense of movement
	Bedding?	88	95	270	45	180	30							No real strong preferred orientation of fractures
	Frac	104	105	270	42	180	43							
	Bedding	129	135	270	43									
	Frac	125	135	90	63	180	65	75	270					Stepped Stria, Normal fault sense of motion
	Dark Band	139.5	148	90	68	11	0							
5	Frac interval	0	62	~90						0	62.5			Very Fissile structure, numerous fractures 1cm or less fragments
	Frac	12	15	90	26	0	35							1cm-2cm spacing fracs. Some preferred frac on fissile microcrack planes. ~90/30-60
	" "	47	57	90	62	356	0							
	Dark seams	53	56	90										truncate/encompass different bedding structure?
3	Mod to heavy dist.	120	147							0	133			Intact, fractured blocks surrounded by very brecciated pieces. No preferred orientation of fractures. Less than min size
	Frac	18.5	32	90	70	334	0							
	Frac set	28	34	270	57	29	0							Offset burrows w/ thrust sense
		29	36	270	56	27	0							
		30.5	37	270	55	42	0							
		53	69.5	270	66	343	0							
	Frac int.	68	120	~270										1-3cm blocks, 1-3cm spacing - Regular spacing with other conjugate between
		79.5	83	270	31	0	31	54	270					
		86.5	89.5	270	37	0	25							
		94.5	100	270	44	0	22							
	Dark seam	118	118	270	11									

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 65K **Observer:** YYTCR **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	fracture	18	20	270	58	0	60			11	103			
	"	34	38	90	35	180	25							
	fractured interval													frag. size: 3cm, aspect ratio 2:1, spacing ~2.5cm
	repfrac set 1	93	97	90	33	180	12							
	" " " 2	110	116	270	33	180	43			103	142.5			
2	fractured interval	0	54							0	20			
	↳rep. frac. set	39	44	90	35	180	33			20	135			frag size: 6.5×1.5cm, long axis aligned to frac orientation, spacing ~2cm
	frac. interval	51	135											
	↳rep fracset 1	70	73	90	16	180	33							drilling disturb, wispy, unparallel, irregular
	fracture	123	135	270	61	0	22	28	270					
3	Fractured interval	7	70							0	118.5			frag. size is within range 2.5 aspect ratio 2:1
	Representative fracture	28	29	270	13	180°	60°							spacing irregular 2.5–5cm
	Fault	32	43	90°	57°	0°	40°							
	Fault	59	62	70°	34°	0°	47°							Dark seam
	Fractured interval	70	96											Deformation bands at same orientation as fractures
		76	83	90°	45°	0°	63° → 37°		270°					
4	Fractured interval	0	94							0	113			Spacing 5cm frag. size 3×2cm
	Representative fracture n1	3	18	270°	64°	0°	15°							
	Repr-frac 2	42	64	90°	64°	180°	26°	20°	270°					
	Convoluted bedding	34	113	–		–			–		–			→ Possible MTD?

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 Site: C0019 Hole: J Core: 65 + 66 Observer: YY + CR + MJJ Summary:

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
5	Fractured interval	0	98							0	54			Convoluted bedding, possible MTD?
	Repr. Fract.	0	43	90°	80°	7°	0°							
	Repr. Fract	78	80°	270°	31°	180°	28°			65	98			
	CORE	66												
2	Dark seam	59	61	270	21	0	5				0	129.5		
3	bedding	55	62	250	42	0	17				0	91		
〃	〃	83	88	250	44	355	0				〃	〃		
	〃	109	116	250	35	180	40				99	140		
4	Fault	2	5	90	25	0	1				0	12		
〃	〃	2	12	90	60	22	0				〃	〃		

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 Site: C0019 Hole: J Core: 67 Observer: YY, CR Summary:

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip az.	Core face app. Dip dip	2nd app. Dip az.	2nd app. Dip dip	Striation on surface rake (≦90)	Striation on surface from (±1, 90 or 270)	Coherent interval (for P-mag) top	Coherent interval (for P-mag) bottom	P-mag pole az.	P-mag pole dip	Note
1	NO Notes?													
2	Fracture Zone	0	90							0	90			① 0.5~1.0cm fragments aspect ratio. 2~3, preferred orientation (250,55)
	〃 ①	0	6	250	60	180	22							
		5	20	250	52	180	24							
	〃 ②	0	16	250	66	180	14							② 0.2~0.5 fragments 〃 〃 (250,66)
		37	51											
	〃 ③	15	46	250	41	180	17							③ 1~5cm fragments 〃 1~4 〃 (250,41)
		46	85											
3	bedding	38	39	90	5	180	12			0	69			
〃	〃	49	50	250	9	180	15							
〃	N. fault	43	53	90	55	355	0	8	90					
4	NO notes?													

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CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** **Hole:** **Core:** 68 **Observer:** **Summary:** Mass Transport deposit, calcareous planar sloped layers and bioturbation. Bedding unsure.

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Frac	33	49	270	64	22	0			32	73			MTD
	Dark seam	55	59.5	90	47	—	—							Possible bedding?
2	Bedding in MTD?	20.5	31.5	90	64	46	0			0	112			2-5cm spacing for fracs. Orientation ~90/40-50. 7+ fracs 0-72cm interval
	Frac interval	43	49.5	90	58	36	0							MTD at top of section
		50.5	62.5	90	43	180	48							
	Frac	3.5	15.5	270	72	21	0							
		65	72	270	48	28	0							
1	Bedding? in MTD	13	24	270	64	32	0							
3	Bedding/Burrow?	15	16	90	18	180	49			0	18			
	Fracture	37	49	270	64	0	0			30	90			
	Fracture	43.5	47	60	34	180	61	primary		frac	orientation			270, 5-10cm spacing
	Fracture	68	76	270	59	345	0							
	Fracture	120	125.5	90	46	0	24			90	140			Change in frac dominate orientation
	Fracture	124	130	90	41	0	14							
	Heavy dist very Brecciated	0	140	90	~40									1cm or less fragments dominate full core. Some concentrated fractures. Cannot measure 2nd plane

Added more measurements

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** **Hole:** **Core:** 69 **Observer:** **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Heavy breccia	0	140	~90	~40					0	141			Less than 1cm fragments. Less than 1cm spacing. Some dominant frac orientation 90/40, can't get 2nd orientation. Some concentrated fracture seams
2	Frac	6	15	90	57	270 89 352	0			2	15			
	Interval	46	54	90	55	5	0			15	143			No preferred orientation, 1-3cm spacing, 2-3 cm chunks
		66	67	90	24	0	25							
	Frac Interval	106	107	90	22	0	20							Preferred orientation 90/20
		110	111	90	19	180	10							
		124.5	125	90	19	180	5							
3	Frac	18	28	90	60	3	0			0	91			Semi consistent Frac orientation. 90/50-60 from 11-38. 270/50 from 38-89.
	Frac	32	39	90	50	40	0							
	frac	44	51	270	50	28	0							The MTD large clasts in mud starts
	Frac	52	60	270	55	295	0							
	MTD Start	93	106							91	105.5			
4	Frac	5	8	90	38	180	28			0	149			Striations
		24.5	26.5	90	31	180	36							Stria
		26.5	29	270	31	0	15							
	MTD	Throughout												
		Large chunks separated by fracs at top 0-70												
		Smaller/skinnier chunks from ~70+ cm												
CC														

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 70 **Observer:** HS, AF, KS **Summary:** Moderately fractured mass transport deposits

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Bedding	6	16	270	66	356	0			6	55			
	fracture	25	30	90	47	180	47							
	fracture	26.5	30	90	33	180	25							
	fracture	28	31.5	90	38	180	21							
	fracture	54	56	270	24	0	6	15	270	54	108.5			striated
	fracture	62	65	90	27	180	25	28	270					curved, striated
	dark seam	75	76	270	5	180	2							1 mm thick
	fracture	76	97	90	75	39	0	68	270					branching and merging, forming a narrow band, sometimes filled with dark material
		79.5	82	270	20	326	0							
		80	90	270	56	336	0							
		89	95	270	42	180	38	54	90					
		92	100	90	52	180	48							
		101	106	270	40	180	55	38	270					

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 Site: C0019 Hole: J Core: 70 Observer: AF, KS, HS Summary: No fracture orientation. No strong bedding, some burrows or bioturbation. Still within a MTD

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	Fracture	38	42	90	31	0	38			0	110			
		56.5	59.5	90	21	180	19							
		42	55	270	69	310	0							High angle fracture, bottom 5cms look like solid/unbroken dark seam
		~~66.5~~	~~68~~											
		95.5	95.5	270	0	0	0							→ Fracture along dark seam
		104	109	90	24	0	41							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 70 **Observer:** HS, AF, KS **Summary:** Mass transport deposits w/ some overprinting of brittle fractures

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
3	fracture	0	30	298	0	270	87			0	130			drilling-induced possibly
	fracture	19	23	0	58	90	25							
	fracture	70	70	90	0	180	33							possibly drilling-induced
	fracture	77	77	90	5	0	30							
	fracture	84	90	270	52	16	0							
	fracture	95	97	90	48	55	0							truncated by the 77 cm fracture
	fracture	113	114	270	3	180	80							
	fracture	125	136	270	60	357	0			138	142			structure is disturbed but likely a minor fault, 4mm or thicker black seam developed along plane
	MTD	0	142											bedding heavily folded, horizontal to vertical bedding, bedding cut by sharp boundaries not associated with ~~any~~ grain size reduction and nearby damage
4	MTD	0	94											
	fracture	1	5	90	41	306	0			0	6			fractures are not planar, curved and truncated, sometimes following the disturbed bedding plane within the MTD
	Moderately fractured by Drilling	8	58							6.5 19.5	19 37			
	Heavily fractured by Drilling	58	94							37 47 70	47 70 94			
	Dark seam	87	87.5	90	9	0	31							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 Site: C0019 Hole: J Core: 71 Observer: HS, AF, KS Summary: Soft sediment deformation overprinted by conjugate set of fractures

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	fracture	0	7	270	50	19	0			0	29			
		6	13	270	44	322	0							
		2	6	90	40	292	0							
		10	14	90	24	0	11							
		15	17	90	20	0	64							
		23	27	90	35	0	58							
		29	40	90	64	341	0							cuts through chloritized ash clast
	Dark Seam	63	66	90	27	180	16			29	77			
	Bedding	69	69	270	56	0	56							
	Bedding	2	10	270	57	356	0			0	29			
	fault	20	21	270	13									offset of a soft-sediment deformation
2	fracture	37	40	90	31	305	0			28	40			
	Dark Seam	33	38	270	82	8	0							
	fracture	41	47	270	57	365	0			40	76			
	Dark seam	46	54	270	57	180	28							
	fracture	60	64	270	32	40	0							
	Dark Seam	72	73	270	8	180	68							2 seams parallel, 0~2 mm apart, marks sharp boundary between
	Bedding	67	70	270	18	180	45							above gray lithology and lower green lithology below

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 Site: C0019 Hole: J Core: 71 Observer: HS, AF, KS Summary:

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
3	Highly Disturbed	0	19											
	Moderately Fractured Zone	19	71							19	119			
	fracture	21	30	270	51	226	0							
		31	47	270	70	234	0							
		28	31	90	27	180	54							
		~~31~~	~~34~~	~~90~~	~~25~~									
		71	74	90	32	36	0							
	Debris Flow Deposits	80	119											layered chloritized clasts
cc	Heavily Disturbed	0	25											
	Dark Seam	25	31	90	77	347	0							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 Site: C0019 Hole: J Core: 72 Observer: Summary: MTD or soft sed def. Fracs not offsetting, more frequent approaching end of section

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Frac zone	14	80							15	43			No real preferred orientation. Slightly fractured / No drill dist
		23	24.5	90	23	0	55							Maybe frac on dark seam?
		45	50	90	45	0	30	46	90	43	118.5			
		54	54	90	8	0	60							
		53	62.5	270	55	2	0							
		56.5	64	270	55	346	0	13	90					Dark mud on top, sandier clast below, sharp contact
	Frac zone interval	78	80.5	90	24	180	39	80	90					Frac interval, spacing 1-2cm
		91.5	98	90	48	0	51							Conjugate/cross cutting. No offsets
		90	98	270	31	0	50							
		97	103	90	50	315	0							
		103	103.5	270	5	0	40							
		111	116	270	42	0	54							
		112.5	119	90	45	0	49							
	Beddings? Dark seam	46	49.5	270	19	180	32							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 72 **Observer:** AF + CR **Summary:** Numerous frac zones w/ different dominant orientation MTD but burrows/structures not offset by frac

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	Frac zone	1	24							0	54			2-3cm frac spacing, No preferred orientation
		7	13	270	49	352	0							
		18.5	22.5	9	35	0	16							
	Frac zone	24	54											No preferred orientation 1-2cm frac spacing, Crisscross and oblique
	Frac zone	55	87	~270						54	72			<1-2cm spacing, more closely spaced with ashy layer
	Rep frac	89	92	270	25	180	50			72	127			MTD → thin 3r bedding isn't real. Burrows not offset
	Frac zone	87	127											
		86	92	90	45	180	21							
		94	101	90	51	29	0							
		114	120	90	50	0	8							
	Breccia soupy	120	138											
3	fracture zone	0	28							0	24			frag: 4 x 1.5cm, long axis orient. along frac, spacing: 2cm
	↳rep frac	12	13	270	4	180	27							
	fault	28	37	270	53	180	24			24	44			
	fault ?	60	60	90	0	0	1							
	frac zone	96	110							73	110			frag: .1cm - .5cm, brecciated along rep. frac orient, spacing ~.5cm
	↳rep frac	99	105	90	49	180	31							
	convoluted MTD bedding	60	66							60	73			slump fold
	"	7	67											

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 73 **Observer:** CR + YY **Summary:** darkseams coincident w/ fractures

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Fractured interval	0	61							8	78			Fragment size 6 x 1 cm spacing 2 cm
	Representative	32	34	270°	20°	0°	20	20	90	79	85			
	Darkseam	23	26	270°	31°	0°	12°			91	109			
	Fault	61	61	90°	3°	180°	20°							
	Dark SEAM	78	81	90°	22°	180	15°							
2	dark seams/	12	15	270	22	0	10			0	16			
	" frac	62	65	270	24	180	7							
	"	82	84	90	20	180	20			16	20			
	bedding	73	77	270	25	36	0			20	141			
	"	47	51	270	20	180	45							
	dark seam/	106	109	270	29	180	59							
	bedding	122	125	270	35	180	61							
	dark seam/frac	55	58	90	34	180	16							
	fault	88	97	90	64	180	19							
3	dark seam	2	2	270	5	180	33			0	41			
	"	44	45	90	10	180	3			42	135			
	bedding	88	90	270°	27°	180°	64							
4	Faults	3	10	90°	32°	180°	9°							
	Bedding	22	26	270°	28°	180°	65°			0	82			
	Faults	26	33	270°	49°	180°	65°							
	Dark seam	37	40	90°	36°	180°	7°			82	92			
	Bedding	69	72	270°	26°	180°	50°							
	Dark seam	88	89	90°	9°	0°	43°							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 73K **Observer:** YY+CR **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
5	fault	10	17	90	50	0	10			8	56			
	fault	28	43	90	62	0	56			59	63			
	dark seam/frac	17	23	90	54	180	9							
	wispy dark seams	18	26							64	99			anastomosing
	dark seams	26	24	90	0	180	33							
	bedding	74	77	270	25	180	1							
	bedding	88	89	90	5	180	50							
6	fault	35	42	270	58	180	44			4	33			
	bedding	50	57	90	38	180	21			33	66			
	fault	70	76	270	46	180	4			68	129			
	frac interval rep frac	117	128	270	55	180	25							size: 2cm @ top → grades to <.5cm @ base, spacing: 0.1cm

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 74K **Observer:** CR + YY **Summary:** Semi-regular (similar orientation) fractures (frac zones). Some Normal faulting. No consistent planar bedding

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	dark seam	6	15	90	51	1	0			3	30			
	bedding	52	54	270	20	180	30			31	38			
	fault	53	57	270	35	0	25			38	54			
	fault	80	87	270	36	0	27			54	103			
	dark seam	120	130	270	24	180	4			103	135			and stromatolitic, maybe soft sed def, wavy and irregular
2	fault / dark seam	25	28	270	27	0	9			0	43			
	fault	28	37	270	50	0	47			43	50			
3	N. fault	20	34	270	72	180	47			0	7			
	N. fault	76	80	90	40	180	20			7	93			2 cm offset
	fault	55	60	270	44	180	42							
4	fract. zone	10	53	90	28	180	8			0	143			2 cm fragment aspect ratio 1~3 preferred orient (90, 28, 180, 8)
4	~~bedding~~	~~57~~	~~64~~	~~90~~	~~63~~									
4	Dark seam	90	95	90	42	330	0							
4	Fault	130	140	90	59	340	0							
4	Fault	107	130	270	84	348	0							Offset/truncate greenish clast. Dark Seam + frac
5	Frac zone	0	40							0	13			Frac zone, no preferred orientation. 1cm ~ 0.5cm clast size. 1cm spacing. frac measured at bottom of zone
	frac	32	35	90	26	180	40			15	33			
		38	57	270	73	351	0			34	85			Frac with potential dark seam offset
	N Fault	62	79	270	77	336	8							offset of bedding/dark band no. 0.5cm
6	N Fault	52	63	90	57	0	41			14 25	23 75			0.5cm offset
		30	35	90	43	180	31							
		32	39.5	90	46	0	51							

CC

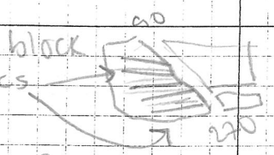
Drilling Breccia / Heavy dist.

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 75 **Observer:** AF, KS, HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Fracture	12	18.5	270	40	180	70			12	25			Top part of frac block has parallel fracs, a set of 
	Heavy Frac Zone	25	87	90						25	74			Heavy frac, some dominant orient. <1cm fragments and frac spacing
	Frac	21	21	90	2	180	38							Some 1cm fragments 25–53cm, moderately to heavy disturb
	" "	35	55	90	57	7	0							
	" "	44	46.5	90	25	180	49							
	" "	69	78	90	60					77	111			
	" "	82	88	270	36	180	65							
	Frac Zone	88	110											
		91	94	90	21	180	53							
		87	100	90	69	6	0							
		96	101	90	53	180	58							
2	Frac Zone	0	90	90	–					2	52			Frac orientation varies from small dip to high angle – 90° orient
	Frac	7.5	8.5	90	23	180	56							
	" "	11.5	13	90	24	180	40							
	" "	19.5	20	90	7	180	30							
	" "	36	42	90	44	0	28							
	" "	45	51	90	44	180	65			55	89			Between these fractures, small fragments with many small brown particles not found anywhere else in the core (loose)
	" "	50	58	90	58	20	0							
	Fault	60.5	61	90	2	180	18							Dark seam, fractured, offset of sandy layer (Slip sense undetermined)
	Fracture	62	67	90	31	0	9							
	Dark seam	70	77	90	48	180	51							Same orientation as surrounding bedding / MTD sed def

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 Site: C0019 Hole: J Core: 76 Observer: HS, AF, KS Summary:

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Moderately Fractured Zone	0	2							4	104			fracture spacing 5~20 mm
	fracture	4	9	270	39	180	12							
		5	9	270	36	180	9							
		8	9	90	13	180	11							
		10	12	90	20	0	35							
		11	17	90	46	180	31							
	Heavily Fractured Zone	21	47											fragment size 1~10 mm
	fault ?	49	51	90	31									
	Rev. Fault	49	57	90	77	18	0	86	90					
	Normal Fault	53	57	90	36	17	0	22	90					
	Rev. Fault	56	57	90	10	0	7	9	90					
	Normal Fault	58	59	270	2	0	0	52	90					
	Proto Breccia	41	50	270	77									lenticular fragment size 0~10mm <8mm thickness, striated fragments
	Bedding	58	59	270	52	339	0							
	fracture	64	65	270	6	0	50							
	Heavily Fractured	76	87											fragment size 1~20 mm
	Proto Breccia	93	104	270	60	193	0							
2		43	48	90	41	180	23							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 76K **Observer:** CR + YN **Summary:** striated fractures

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	t. fault	5	9	90	30	0	71			0	17			offset: 3.5 cm
	N. fault	76	79	90	20	0	35			17	42			" > 4 cm
proto-breccia? ←	fracture zone	42	78							42	88			frag size: 1cm, spacing: 0.5 – 3cm → towards base of section
	rep frac 1	68	70	270	41	180	18							striated clast surfaces, more polished/glossy
	" " 2	57	60	90	14	0	50							
	bedding	0	4	270	45	14	0							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 7K **Observer:** YYtCR **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	bedding	26	40	270	64	0	62			0	22			general:
	N. fault	52	56	90	59	270+123	0			25	89			striaiated surfaces on larger fractured clasts & in frac zones
	fault	66	88	270	63	42	0			90	105			offset: 3cm
2	fault	30	31	90	35	180	40			0	24			Biscuiting/rot. along fault because bedding opposite
	bedding	30	31	90	45	28	0			31	54			
	fractured zone/ proto-breccia,	57	123											size: 1.5 cm, aspect ratio 1:1, thickness: 0.5 cm to base of section/co no pref orient preserved - heavily drill disturb. polished, striaiated surfaces

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019J **Hole:** J **Core:** 78K **Observer:** YY+CR **Summary:** Striated clasts→damage zone

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	bedding	46	48	270	25	0	44			5	9			fractured clasts commonly striated
										10	16			
	fault	91	100	90	56	0	65			26	36			
	bedding	100	102	90	24	0	32			42	54			
										56	95			
	fault / breccia	112	123	90	26	180	45			96	114			
	bedding	126	126	270	2	180	13			121	130			
2	fracture interval	0	148							8	15			0% in-situ, all dissaggregated clasts largest frag: 5cm
										43	49			smallest: .5cm x .1cm, some intervals aspect ratio:
										70	91			striated surfaces on clasts

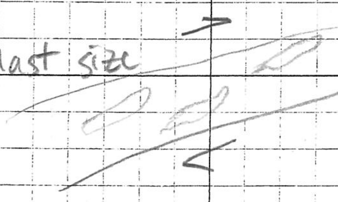
CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 Site: C0019 Hole: J Core: 79K Observer: YY+CR Summary: damage zone

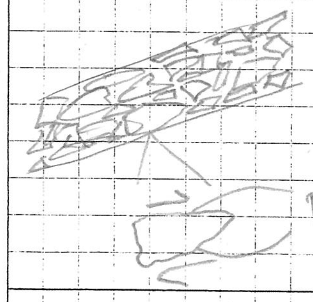
Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	bedding	25	29	270	33	0	11			10	64			
	frac. zone/ breccia	24	64											size: 2x1 down to .5cm, no pref orient, strail
	bedding	75	83	270	55	180	17			68	86			73-75 3cm pyrite
2	bedding	6	9	270	35	21	0			0	11			
	frac internal	17	26							11	61			irregular spacing, irreg clast size
	N. fault	28	35	90	54	180	45							>1 cm offset
	bedding	73	76	270	30	0	17							
	frac interval	80	98	90	55	0	8			61	97			wavy-planar - may be drilling induced?
	bedding	27	30	270	19	0	27							
	drill disturb.	37	47											radial frac from core liner edge



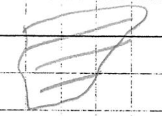
→ sheared burrows elongate along bedding?

↳ Amy says just cut at a oblique ∠

@ 25cm large pyrite



view:



thrust sense of motion?

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 80K **Observer:** YY + CR **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	fault	35	46	90	61	300	0	69	300?	26	35			
										35	56			
	fault	52	56	90	27	180	3	75	270	79	88			
	dark seam	84	84	90	7					98	105			looks like alteration band around large pyrite clast
	dark seam	85	86	270	16									microfaulted block
	" "	102	102	270	12	0	45							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 81 **Observer:** KS, AF, HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Frac	6	7.5	270	14	0	53	74	90	3	10			
	" "	9.5	11	270	15	0	5	73	270	10	95			
	Bedding	12	15	270	22	310	0							
	Frac	12.5	16	90	29	0	25			95	129			
	Dark seam	13	17.5	270	44	335	0							
	Frac	20	28.5	270	54	349	0							
	Bedding	25.5	31	270	51	360	0							
	Dark seam	44.5	51	270	50	356	0							→ Dark seam Along apparent bedding contact, offset in 2nd plane potentially by Def Bands that run up and down core and cross cut or slightly offset bedding structures
	Def Bands	48	68	270	66									
				90	73									
	Bedding	71	75.5	270	38	180	16	48	270					potential Fault, sudden bedding contact
	Fault	75	78.5	270	31	180	9	40	270					polished surface, concentrated dark seam/material
	Bedding	81	83	270	23									Bedding or fault plane?
	Blue stuff Top	82	85.5	270	35									
	Bottom	84.5	87	270	31									Polished surface,
	Fault	86	89	270	34	0	13	51	270					
	Dark seam	88.5	93	270	37	0	12							
	Normal Fault	103	108	90	39									
	N. fault	99	104.5	90	41									30-50mm offsets
	Normal fault	99.5	104	90	41									
	Normal fault	97.5	101	90	33									
	Bedding?	110.5	115.5	270	42	0	56							Contact near ashy layer
		113.5	118	270	40	0	46							Bottom of ashy layer, potentially dark or altered material at contact
	Def Bands	117	122											Anastamosing dark seams potentially final offset

Fault 119.5 130 270 79 (dark seam) cuts def

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 81 **Observer:** KS + AF + HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	fault	0	8	270	70	49	0	33	270	1	59			
	bedding	3	6	270	31	0	6							
	fracture	7.5	10	90	23	0	20							
	〃	11	16	270	37	180	25							
	〃	18	22.5	90	37	0	30							
	dark seam	24.5	28	270	32	9	0							
	Bedding	35.5	39.5	270	31	350	0							
	〃	39.5	42.5	270	33									
	fault	39	41	90	14									
	〃	38.5	40.5	90	19									
	Fault	47	52	270	39	180	28							
	Fault	52.5	55	270	25	180	38							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** **Hole:** **Core:** 82 **Observer:** KS, AF, HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	fault	95.5	102.5	90	55	18	0			3	96			
	fracture	103.5	104	90	5	180	37							
	Fault	35	44	90	59	340	0							
	fault	45	45.5	90	8	0	14							
	frac	40.5	51	90	67	7	0							
	Bedding	45	46	90	9	0	27							
	frac	52	59	270	53	328	0							
	" "	52	71	270	67	7	0							
	Bedding	64.5	65	270	2	0	17							
	Fault	71.5	74.5	270	24	180	16	56	90					
	Dark seam	74.5	79.5	90	49									
	Dark seam	84.5	84.5	270	1	0	6							
	Fault	90	98	90	59	18	0			96	105			
	~~Fault~~	~~95~~	~~102.5~~	~~90~~	~~52~~	~~61~~	~~56~~	~~0~~						
	Fault	121	128	270	47	14	0			121	132			
	Frac	127.5	129	270	14	0	22							

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 Site: C0019 Hole: J Core: 82 Observer: KS, AF, HS Summary:

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	Frac Zone	0	18							0	18			
	Dark Seam	12	14	90	22	180	60							Potential burrow offset
	Frac	7	8	90	9	180	4	12	270					
	Frac	10.5	12	90	12	0	35							
	Brecciated	22	27							21	86			
	~~Frac~~ Bedding	25.5	29	90	32	0	20							Fault at bottom of brecciated zone. thick dark band/gouge material
	Fracture	30	39	90	58	354	0							
	" "	37	42.5	90	48	59	0	13	270					
	" "	40	53	90	71	31	0							
	Fault	46	52.5	270	43	0	23	40	270					Polished surface. Sharp bedding change
	Fracture	50	53.5	270	28	180	28	21	270					Also polished but no Lithe change
	Frac	53	55	270	19	180	40							Color offset, Not super polished
	Fault	54	58.5	270	36	0	34							
	Beddings	57	61	270	37	348	0							Bioturbation/Burrows
	Frac zone	70	83											
		75.5	75.5	90	90	180	7							Fracs 90/90 or 90/28 common
		72	75	90	28	0	14							
		62	70	270	56	24	0							

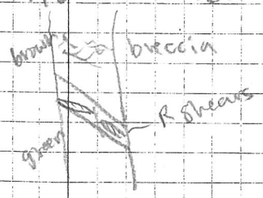
CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 83K **Observer:** CR+YY **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	fract. interval	0	24							0	120			clast dropped in core barrel @ top?
	↳ rep frac.	11	24	270	61	310	0							frag size: 0.5 - 1cm, variable spacing
	frac. interval	23	63											
	↳ rep. frac	36	37	270	22	0	20	90	90					frag size: 1.5x3 cm, more anastomosing, ~1cm spacing
	↳ top frac	27	31	90	41	180	15							green interval ↳ polished surfaces ↳ trans
	↳ bottom frac	60	65	90	41	0	35							
	bedding/ dark seam	78	80	90	36	4	0							
	frac interval	92	116											
	" "	131	149	90	45	5	0							
	↳ rep frac 1													22 cm spacing, 2x4cm frag
	" " 2	131	133	270	27	180	52							
2	fracture interval	0	31	1x2.5cm frag. .7cm spacing but irregular one 6x6cm intact piece						0	141			1cm wide, clasts of green, coarser med/silt below entrained — chill has fabric elongate in shear band direction, seams bifurcates into a fainter seam near ~41cm on 90° side of split face
	dark seam	34	43	90	54	180	9							
	t. fault	50	68	270	65	15	0	90	90					
	t. fault	55	57	270	15	180	25							offsets ash
														" "
darker	coarse layer upper contact	66	69	90	34	180	32							striated
	coarse, darker layer lower cont.	72	72	90	1	0	3							
	pink ashy layer w/ alteration dark seam around it	127	128	90	16	180	0							



skeptical any of these are bedding

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 84 **Observer:** CR + YY **Summary:**

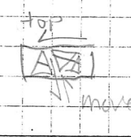
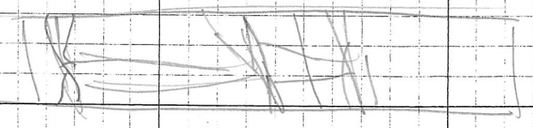
Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	fractured interval	30	54							30	67			anastomosing frac, ~2cm frag aspect 2:1, spacing variable ~1.7cm
	↳ top frac	36	36	90	3	180	47							frac. starts under ash
	↳ bottom	49	54	270	45	180	60			73	90			
	↳ rep	42	43	270	1	0	51							
	ash lower contact	67	67	270	1	180	10							
	↳ bedding													
	fault	83	89											
														ash way-up indictor - top of core - top
														could be drilling induced - void space below, normal fault
2	dark seam	33	34	270	17	180	5	270	55	0	37			striated, can see cut surface of dark seam
	def bands	20	23	270	55	5	0			47	129			
	fracture/dark seam	85	88	90	40	180	31	60	270					
	dark seam	95	100	270	47	344	0							anastomosing
	bedding	104	105	270	9	0	2							
	fault	112	115	90	30	4	0	56	270					← this orientation fracture consistent throughout section w/ ~2.5 cm spacing

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 Site: C0019 Hole: J Core: 85 Observer: KS, AF, HS Summary:

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Dark seam	15	18	270	30	180	14	75	270	0	53			
	Frac	22	27	270	40	180	23	77	270					Stria
	Dark seam	32	37	270	49	180	12							
	" "	37	40	90	16	0	18							Stria
	Frac	59	60	270	12	0	26	30	270					offsetting dark seam  movement
	" "	59.5	58.5	90	13	0	25	32	270					Stria
	Frac	68	70	270	19	0	4	9	270					
	Frac	75	76	90	11	0	9	51	270					
2	Frac	4	11	270	47	180	65	57	270	0	107			
	Bedding	18	20	90	23	0	21							Bioturbation/Burrows
	Fault	20.5	20.5	270	2	0	25	32	270					offset clast/burrows
	" "	20	23.5	90	33	180	44							offset clast/burrows
	Frac	30	42	90	55	0	71							
	Def Bands	44	82	~270										Angistom dang thinning/thicken — concentrated/thicker seams have more 270/ orientation but also near vertical ones between (4) between 50-64cm
	Frac	43	94	90	80	346	0							
	Def band	46	47.5	90	15									
	" "	45	46.5	90	11	thin								
	" "	47	49.5	270	37									
	" "	67	68.5	270	25									
	" "	70	70	270	1									
		74.5	75.5	270	23									
	Bedding	81	87	90	47	0	30							
	Frac	93.5	96.5	90	25									
	Dark Band	93.5	96.5	90	27	0	25							Def bands below, small mm offsets

→ mineralization along plane? secrete? possibly 4cm offset, thrust fault

rotated split plane 45° clockwise on the top view
Same plane shown in coronal XCT image

CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 Site: Hole: Core: 85 Observer: Summary:

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
3	Dark seam Fault	9	13	90	32	0	26			0	76			offset/truncating burrows and color change
	Thrust Fault	17.5	20.5	270	29	180	7							offset bedding, 2cm
	Frac	24	33	90	44	0	42	14	90					
	Frac	33	33.5	270	4	180	45							
	Fault	33.5	45.5	90	61	7	0							Fault fluid w/ calcite
	web Struct.	35	51.5											light Blue-green calcite (thin calcite breccia)
	calcite breccia	38	38	90	26									
	" "	39	39	90	17									
	" "	40	40	90	16									
	" "	41.5	43.5	90	39									
	" "	42	44	90	36									
	" "	42.5	46	90	34									
	" "	46.5	50	90	44									
	" "	47	51	90	50									
	" "	36	42	270	75									
	Fracture	63.5	67.5	90	34	0	59	69	90					
	Def Bands	68	70	270	18									
	" "	69.5	~~72~~	~~270~~	23									~mm offset
	" "	70.5	73	90	59	Redone								
		70	72.5	90	55									
		66	67	270	27	0	15							
		68.5	70	270	23	0	47							
		70	71.5	270	22	0	43							
		70.5	72	90	53	0	28							

CHIKYU Operation

Structural Geology Observation Sheet

No.

Exp.: 405 Site: C0019 Hole: J Core: 86 Observer: KS + AF + HS Summary:

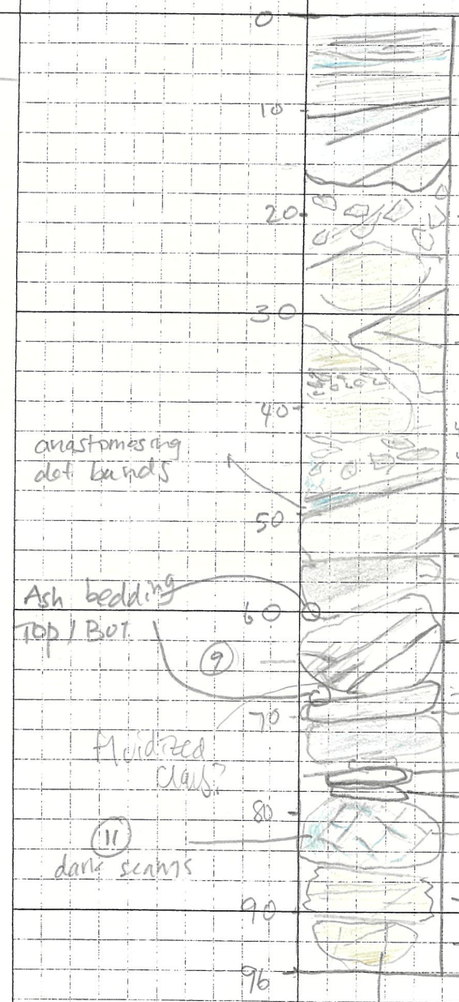
deformation above possible PSZ
~~highly fr~~ blue alteration ash, def bands, and drilling disturbed blocks
* blue color concentrated next to ash @ 0-10, 56-64 and 74-76

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip az.	Core face app. Dip dip	2nd app. Dip az.	2nd app. Dip dip	Striation on surface rake (≦90)	Striation on surface from (±1, 90 or 270)	Coherent interval (for P-mag) top	Coherent interval (for P-mag) bottom	P-mag pole az.	P-mag pole dip
1	Soup	0	60										
2	Bedding (1)	11	14	270	25	180	27			7	18		
	lamination (2)	7.5	7.5	subhorizontal 270	02	180	56						
	def band (3)	12.5	14.5	270	32	0	20						
	dark seam (4)	31	31.5	90	12	0	48			36	42		
	fracture (5)	46.5	49.5	270	38	180	26						
	" (6)	49	52.5	270	40	180	14						
	" (7)	54.5	55	90	3	0	36						
	" (8)	56	59	270	36	0	35						
	lamination (9)	58	63	270	58	180	27						
	fracture (10)	68	69	270	9	180	7			64	73		
	dark seam/ def band (11)	78	84	90	21	180	30						
		"	"	270	35	180	36						
	Ash bed (12)	64.5	65.5	270	12	180	30			76	95		

Top of Ash

Bot of Ash

Note



light, grey blue sand, laminated (2)

(1)

(3) def bands

1/2-2 cm fractured pieces, angular polished surface

(4) dark seam

fracture zone, 1/4-1cm size, 1:2 aspect ratio

(5)

(6)

(7)

(8) cobble gradds from blue gray mud to ash

potentially rotated

65-68 cobble blue grey w/ ash top (12)

(10)

blue, grey, light, same as 0-10 cm

Breccia ??

cobble w/ dark seams, blue color along seams

Brown cobbles w/ dark seams

same color as 86K-2

from 90 core edge

0 Ash
11 Blue grey block
16 frac zone >1cm
23 Brown/ grey Block
28 "
35 frac zone <1cm
39 Brown/ grey Block
41 frac zone >1cm
46 grey/ Brown/ Blue block
49 Brown grey Block
53 Brown grey Block, Ash bottom
55 Ash bed/ block
64 Blue/ grey Block
68 Blue/ grey Block
72 thin fracture piece
74 Ash?
75 sheared? Ash?
77 Brown grey Block, Blue def bands
81 Brown/ grey Block def bands
90 "
96

CHIKYU Operation

No.

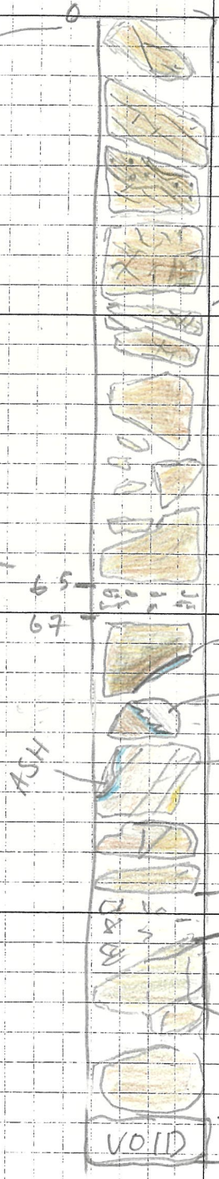
Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 86 **Observer:** KS + AF + HS **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
3	fracture zone ①	0	65							0	14			
	"	12	16	90	45	0	14			15	30			
	"	18.5	23	90	43	0	25							
	"	22.5	25	90	29	0	58							
	Fault (likely thrust)	30.5	34	270	33	0	64							
	" ① cont'd	36.5	39	90	31	180	36							
	"	40	44	90	33									
	"	44	49	90	43	328	0	striated 70	90					
	"	52.5	55	90	21	~0	~0	70	90					
	fracture zone	65	67						1-1.5cm					
	dark band ②	70	72	270	43	180	18							
	def bands ③	78	83	270	70	~339	0							
										88	93			
	def bands ④	95	101	~270	31	0	75							

from CT

1 cm offset of darker dike looking thing w/ white specs, THRUST sense → fluidized injection?



① 3-9 cm blocks of brown/yellow/grey mud with high concentration of anastomosing dark seams between 0-48 on the cut faces. weak preferred orientation of flat block faces/fractures of ~90/30

higher density dark seams

② dark band

Ash

③ grey brown clast w/ blue next to ash and yellow/brown/grey in the bottom R. corner → def bands / anast. dark seams

fracture zone, ~1 cm pieces w/ ~1:1 ratio

④ def bands/anast dark seams

CHIKYU Operation

No.

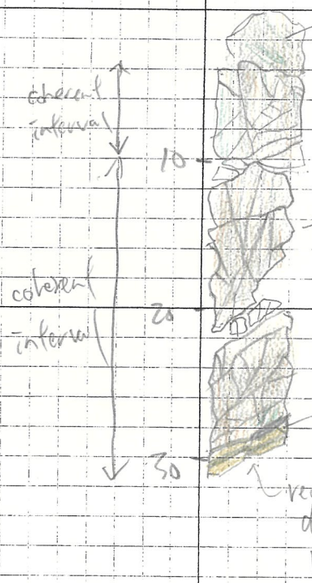
Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 87 **Observer:** HS, AF, KS **Summary:** Damaged green/gray rock with anastomozing black seams

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	Deformation Band	3	10											
	Deformation Band	11	30	270	35	0	27							
				270	62	0	56							
				270	83	0	4							
	dark Seam	28	30	270	23	0	20							
	reverse fault	26	31	270	50	0	54							

from CT

check for striations?



polish surface on surface of rotated piece

Deformation band w/ anastomozing dark seams

Seams < 1mm thickness

offsets along individual seams

Deformation band w/ anastomozing dark seams

white/green ashy clast

reverse fault offset of ~2mm

dark seam < 3mm thickness

reddish brown below dark seam

CHIKYU Operation

Structural Geology Observation Sheet

No.

Black
pale yellow
cream orange
dark orange/red
peach

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 87 **Observer:** KS + CR **Summary:** core 87 section 2, sheared / brecciated mud / clay / chert

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole	
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip
2	Frac	6	9	270	46								
	def band	3	8	270	82								
	def band	5	7	270	42								
	Shear band	10	15	270	50								
	"	13	13	270	20								
		15	16	270	20								
	darkseam	22	22	90	7								
	"	23	24	270	23								
	"	27	29	270	24								
	laminations darkseam	31	32	270	5								
	dark Seam	35	37	270	25								
	fracture	37	38	270	23								
	t. fault	46	48	90	29								
	def band	32	34	270	47								
	darkseam	43	44	90	9								
	fault	6	14	270	75								
	darkened gouge / branching	58	60	90	16								
	orange fabric clay	60	62	90	13								
	wipsy darkseams	72	76										
cc	laminations	7	9	90	9								

Note

curviplanar faint blue to grey color change w/ dark seam ~1cm below

.6mm thick

dark seam w/ foliation

offset dark seam/band

1cm thick

1/2 cm brown lense, 1.5 cm blue lense

curviplanar (108-109) mm dark lenses in yellow orange

1cm × 3 1/2 cm fracture pieces w/ black dots

Black / Brown gouge

offset choc brown

pink / orange

Blue / grey → brown yellow mud

Brown / yellow mud

def bands ? to ~90°

blue grey blocks

Brown / blue / grey

brown polished surface ~90/0, 0/45

foliated dark material

Brow / red breccia / soupy

laminated yellow → orange (1/2 cm foliated orange)

Black (96-97) 1cm

(100-101)

yellow orang → yellow grey

scaly yellow grey fabric

scaly orange yellow wrap around laminated yellow chert

laminated yel chert

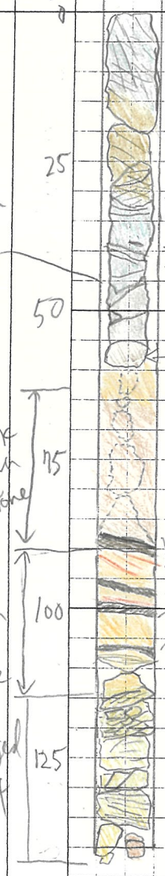
CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 87 **Observer:** HS **Summary:** Boundary between prism mudstone and chert from oceanic plate.

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip (CT)		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
2	Protobreccia	6	11	270	47	0	85	5~10 mm thick developed inside a burrow?						
	Def. Band	9	14											
	fracture	16	17	270	16	0	39							
	fracture	16	20	270	31	0	11							
	Def. Band	18	30	270 270	18 67	90 90	64 10				proto-breccia layers			
	fracture	29	34	270	44	0	15							
	Def. Band	31	32	270 90	9 9	0 180	20 14							
	Fracture	56	60	90	13	180	42	62	270	shiny striated surface		dark brown mudstone		
	Dark Seam	88	90	270	13	180	27					red-brown mud stone		
	Fault (Red clayey)	91 92	93 94	270 270	26 26	0 0	5 5	<10 mm thick, foliated 3~5 mm thick						
	fracture zone	120	126	270 90	15 20	0 0	5 0	5-8 mm spacing		cross-cutting internal faults				
	foliated clayey shear band	131	136	90	10	0	15	creme-yellow-color foliation <1 mm spacing						
	Def. band	35	38	270	26	0	8							
	fracture	38	40	270	26	180	10							



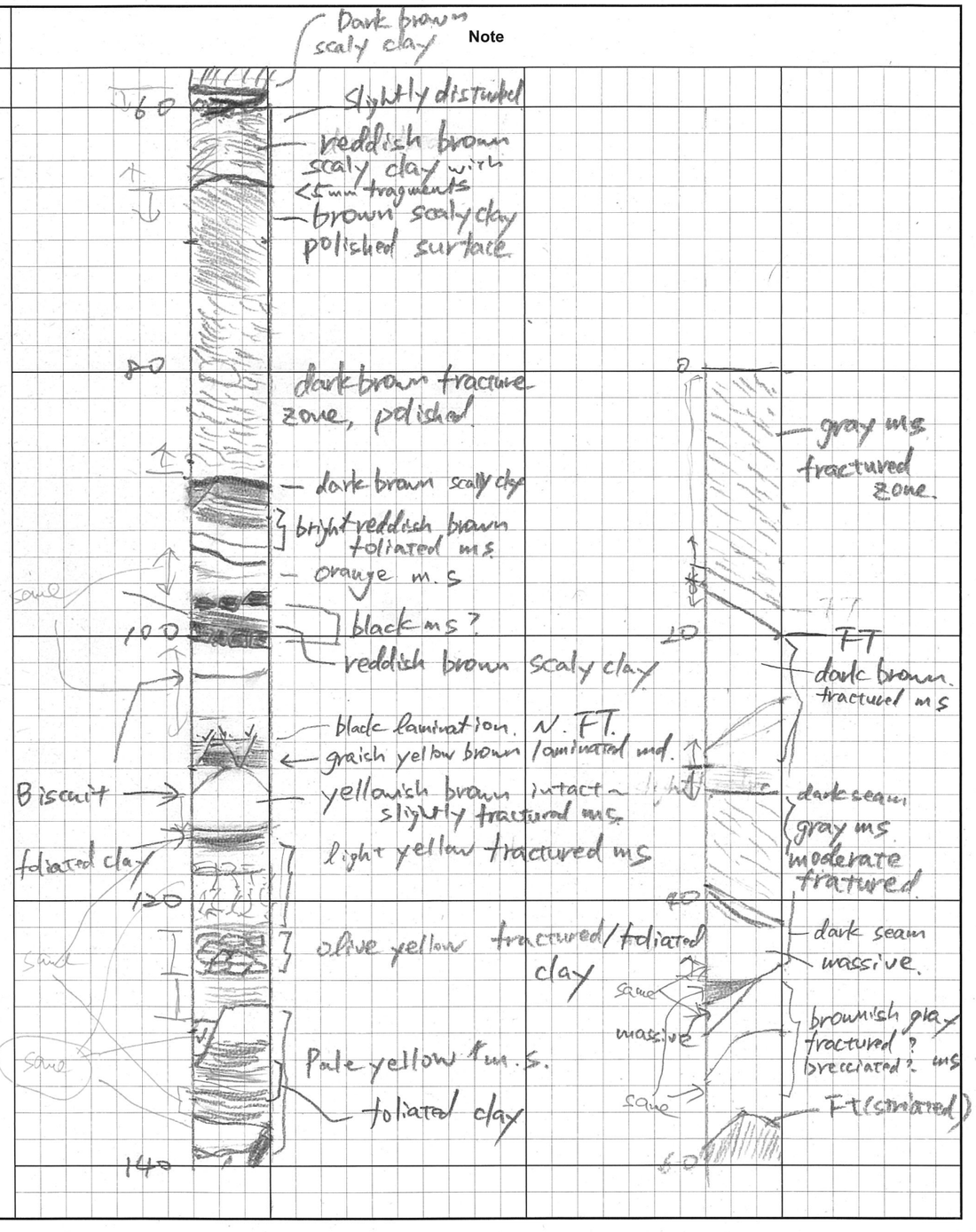
CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 87k2 **Observer:** Y Y **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	



CHIKYU Operation

No.

Structural Geology Observation Sheet

Exp.: 405 **Site:** C0019 **Hole:** J **Core:** 86 **Observer:** CR+YY **Summary:**

Sec No.	Structure ID	Top of Struct	Bottom of Struct	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		Note
				az.	dip	az.	dip	rake (≦90)	from (±1, 90 or 270)	top	bottom	az.	dip	
1	chert + pelagic clay	0	20