

Structural Geology Observation Sheet

No. _____

Exp.: 333 Site: C0011D Core: 1H Observer: B.G Summary: Greenish layers, seeming to be post-deposit alteration, are repeatedly shown with similar direction of dipping angle.

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
1	bedding	39.5	39.5		90	6	180	11							0~25 cm disturbed
	bedding	103	104		90	8	180	3							Greenish layer Silty clay
2	bedding	78.5	75		90	12	0	1							Ash layer under Ash layer, b/w 75 ~ 85 cm, disturbed.
3	bedding	66	67		90	10	180	8							Greenish layer.
5	bedding	35	36.5		90	14	180	4							Greenish layer.
	bedding	113.7	114		90	3	0	2							Silty
7	bedding	6.5	8		90	12	180	26							Ash
	bed.	18	20		90	15	180	28							Greenish layer
8	shear zone	0	142												
8	bed.	116	117		90	11	180	21							Greenish layer
9	bed.	59.5	60.5		90	15	180	34							#9 Top 0~22 cm, bottom 86~109 cm disturbed Greenish layer

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Exp.: 333 Site: C0011D Core: 2H Observer: B.S. Summary: 3 sets of structures ① bedding ② shear zone ③ faults (2 directions)

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
1	bedding shear zone	84	85.5		90	18	0	4							#1 shear zone 35cm ~ 68cm
		35	68		90	76	0	79							
2	bedding	38	39		90	10	180	2							Greenish layer.
3	N. fault	21	32		270	51	39	0							#3 Normal & conjugate fault.
		27	37		270	34	34	0							
		36	48		270	72	37	0							
	conj. fault	44	54		90	26	322	0							#3 Shear zone (slump)
		47	52		270	54	26	0							
	shear zone	49	140		90	76	0	63							
4	N. fault	15	17		270	10	180	45			0	71			#4
	N. fault	26.5	29.5		270	30	180	37			0	71			
7	shear zone	68	103		90	78	0	79							

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No. .

Exp.: 333 Site: C0011D Core: 2H/3H Observer: B.S Summary: Core 3H: mostly horizontal beds. with thick ash layer (18cm thickness)

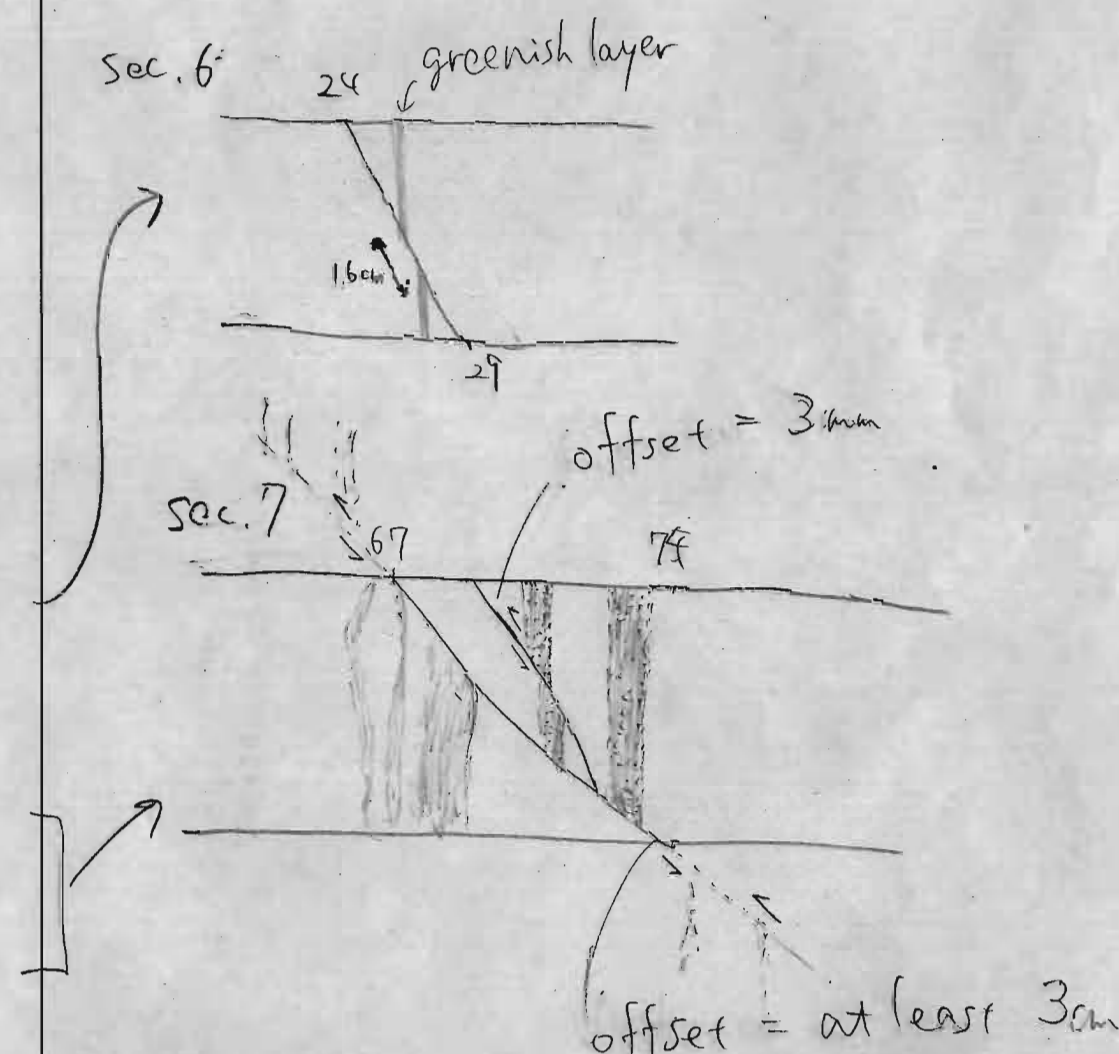
Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
2H	4 bedding	68	70		90	20	0	40			0	21			Ash layer
											0	21			dark gray
	bedding	75.5	77.5		90	13	0	20			73	120			Ash
	bedding	93	99		90	6	180	1			73	120			
	7 bedding	31.5	32		90	3	0	4							
	8 bedding	21.5	24		270	35	180	5							Disturbed
	9 bedding	59.5	60.5		90	2	180	20			58	105			
3H	1 fault	132	137		90	38	0	56							
	2 bedding	25	25.5		90	5	180	2							
	bedding	61.5	62		90	5	180	3							
	3 bedding	70	70.3		90	4	0	3							
	bedding	106	106.2		90	2	0	4							
	6 bedding	128	129		90	2	0	0							
	7 bedding	65	66		270	8	180	3							
CC	bedding	33.5	33.7		270	2	0	4							

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Exp.: 333 Site: Cool/D Core: 4H Observer: A.Y Summary: Gently tilted beddings & normal faults.

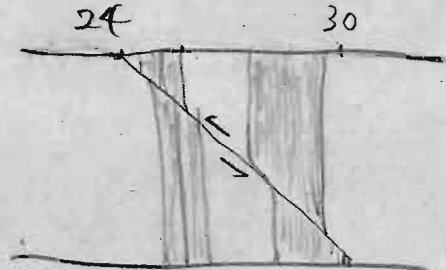
Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
1	bedding	127	128		270	8	164	0							
2	bed.	9	10		270	7	337	0							
	bed.	53	56		270	5	118	0							
	bed.	74	75		270	8	337	0							
	bed.	102	103		90	3	83	0							
3	bed.	27	29		270	11									
6	bed.	55	56		270	6	347	0							
	vein structure	58	61												
	bedding	75	76		270	5	328	0							
	bed.	80	81		270	5	335	0							
	fault (normal)	25	29		270	34	343	0							
7	bedding	51	52		270	6	44	0							
	fault (normal)	63	74		270	48	316	0							
	fault (normal)	69	72		270	36	324	0							
	bedding	114	115		270	4	68	0							

 8 vein 43 50
 Structure 61 65


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Exp.: 333 Site: 6001D Core: 5H Observer: A.Y. Summary:

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
1	vain structure	55	75		270	50	346	0			0	41			← same orientation to minor faults.
	fault	85	91		270	50	338	0							
	fault	101	107		270	50	328	0							
	fe	127.5	134		270	52	320	0							
2	fe (normal)	24	30		270	47	311	0			0	41			offset = 8mm 
	fe	38	45		270	45	319	0							
	fe	46	50		90	28	57	0							
	ft	54.5	59		270	44	180	38							
	fe	90.5	95.5		270	36	324	0							
	fe	103	108		270	38	317	0							
	bedding	82	82		90	0	0	0							
3	ft.	21	28		270	52	342	0							
	ft.	33	41		270	57	347	0							
	ft.	41	49		270	53	350	0							
	ft.	55	61		270	44	355	0							
	fe	69	75		270	46	346	0							

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Exp.: 333 Site: Cool P Core: 511 Observer: A.T Summary:

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
3	fault	74	81		90	52	29	0							sec. 3 offset = 2 mm offset = 2 mm offset = 3 mm
	ft.	76	83		90	47	51	0							
	ft. (normal)	81	90		90	45	46	0							
	ft. (normal)	85	93		90	44	56	0							
	bedding	84	86		270	12	14	0							
4	bed.	19	20		270	2	339	0							offset = 4 mm. offset = 4 mm.
	ft.	34	41		90	49	67	0							
	ft. (normal)	49	55		90	45	329	0							
	ft. (normal)	79	86		90	47	330	0							
	vein structure	108	110		90	78	99	0							
6	ft.	56	62		90	42	66	0							sec. 7 offset = 8 mm
	bed.	96	97		90	0	0	0							
7	bed.	10	11		90	2	357	0							
	bed.	16	17		270	7	17	0							
	faults (normal)	45	50		90	68	35	0							
	bed.	71	72		270	8	350	0							

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Exp.: 333 Site: G0011D Core: 5H Observer: A.Y. Summary: Subhorizontal beddings & high-angle normal faults (conjugate)

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
8	fault	10	20		90	54	13	0							offset = 2m
	ft. (Normal)	19	25		90	49	359	0							
	ft	76	82		270	36	76	0							
* sec. 1 ~ 3 middle : 1st dip 270° is dominant Sec. 3 middle ~ sec. 8 : 1st dip 90° is dominant															

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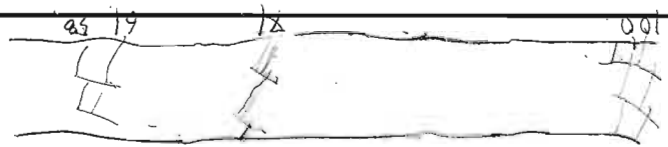
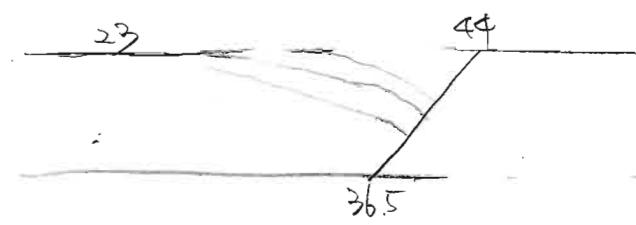
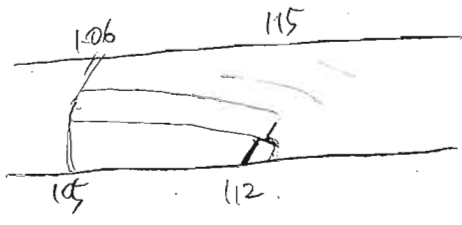
Exp.: 333 Site: CoolID Core: 6H Observer: A.Y. Summary:

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
1	fault	38	45		90	30	311	0							
	ft.	70	81		90	56	306	0							
2	ft.	20	31		90	63	75	0							
	bed.	83	86		270	30	301	0							
3	bed.	86	87		270	12	337	0							
5	ft.	43	48		90	31	36	0							
6	ft.	31	37		270	33	57	0							
	ft.	67	73		270	45	351	0							
7	ft.	28	31		270	20	53	0							
8	vein	47	61		90	80	340	0							

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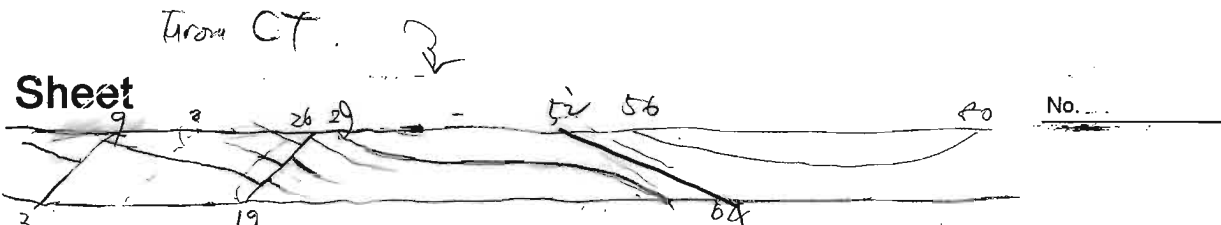
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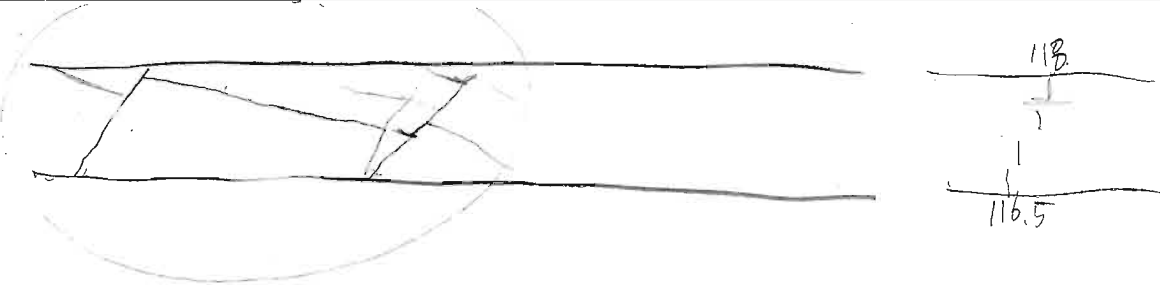
Exp.: 333 Site: COOLID Core: 7H Observer: B.G. Summary: fault & shear zone with minor fault.

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
1	shear zone	8.5	135												
	(def'n band)	52	52												
	ft	87	93		90	45	245	0							
		88	96		90	50	245	0							
2	bedding	2	3		90	11	180	4							
	shear z.	23	140												
	fault	37	44		90	50	180	46							
	fault	84	90		90	40	180	36							
	bedding	88	90		90	12	0	0							
	bedding	105	106		90	5	180	4							
															

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Exp.: 333 Site: C0011D Core: 7H Observer: B. S Summary:

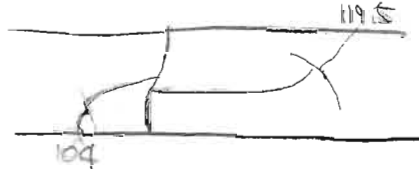
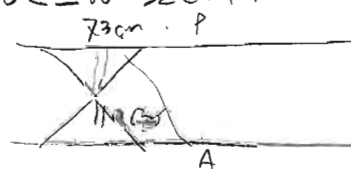


Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
3	shear zone	0 (top to bottom)	14												 From CT => but, it's in WRBS' sample. ☺ 29 27 #5 60cm ~ CC : flow-in ↓
	bedding	137.5	138		90	3	0	4							
	able to see through CT image (but it's in WRBS)														
	bedding	16.5	16.5		90										
	bed.	17.5	17.7		90										
	bedding	39.5	39.5		90	2	0	3							
	bedding	41	41		0	0	180	6							
	shear zone? or flow-in														

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No.

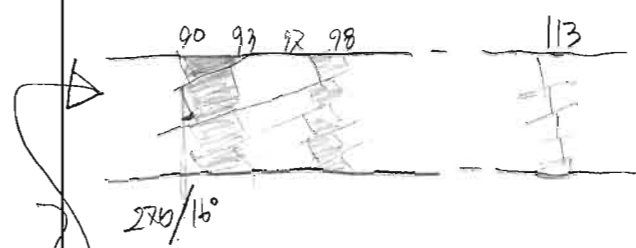
Exp.: 333 Site: COO11D Core: 8H/9H Observer: B. S Summary: Conjugate faults & shear zone.

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
8H	1														0 ~ 52 cm flow-in
	bedding	62.5	63		90	2	0	3							In shear zone (CT image). 
	bedding	83	84		90	6	0	3							
	2														CT-image capture: COO11D08H02-16-32 cm. conjugate fault on AP surface offset 
	shear Z	26	34												
	shear Z	40	82												#3 ~ #CC : Flow-in
9H	1														#1 section seems to have random cracking — check it at Ashuka.
	bedding	45	45.5		90	2	180	4							
	bedding	87	87.3		270	1	180	10							
	2														
	bedding	11	12		270	11	180	20							
	bedding	70.5	71		270	5	0	2							

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Exp.: 333 Site: C0011D Core: 9H Observer: B.S. Summary: conjugate faults x shear zone (with ① minor faults, ② vein structure, ③ deformation localized band)

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
2	ft	67	70		270	30	180	60							CT-image capture: C0011D09H02-94-115cm Conjugate faults
		66	69		90	29	0	38							
	ft	100	109		270	38	180	65							
	bedding	140	141		270	5	180	9							
4	fault	4.5	8		270	30	180	30							~ #9 : shear zone
	shear Z.	13	91												
	(localization)	33	34												
		42.5	43												
		48	48.2												
		52	53												
		74	74.3												
	bedding	76	76.5		90	/	180	2							CT-image capture: C0011D09H04_0-15 cm : reverse offset on AP surface C0011D09H04_68-84 cm
	shear Z.	0	140												
	(localization)	7	2.5												
		82.5	84												
	bedding	90	91		270	11	180	2							
5	bedding	97	97.5		270	7	0	0							
	bed.	112.5	113		270	4	180	4							

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Exp.: 333 Site: Cool/D Core: 10H Observer: A.Y. Summary:

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
1	fault	33	37		270	31	26	0			0	139			
	fault	88	96		270	49	34	0							
	ft.	92	95		90	34	329	0							
	ft. (normal)	109	116		270	46	53	0							← offset = 5mm
	ft.	22	28		270	42	35	0							
2	ft.	175	22.5		90	45	330	0							
	ft.	12	17.5		270	37	42	0							
	bedding	35	36		270	1	103	0							
	ft.	54.5	59		270	35	41	0							
	shear zone	81	88		90	42	79	0							
3	ft.	115	119		90	34	57	0							
	bed.	68	69		90	6	100	0							
	bed.	69	70		90	2	82	0							
	bed.	79	80		270	1	84	0							
	bed	82	83		270	6	56	0							
	bed.	87	88		270	4	73	0							
															parallel lamination.

270-32

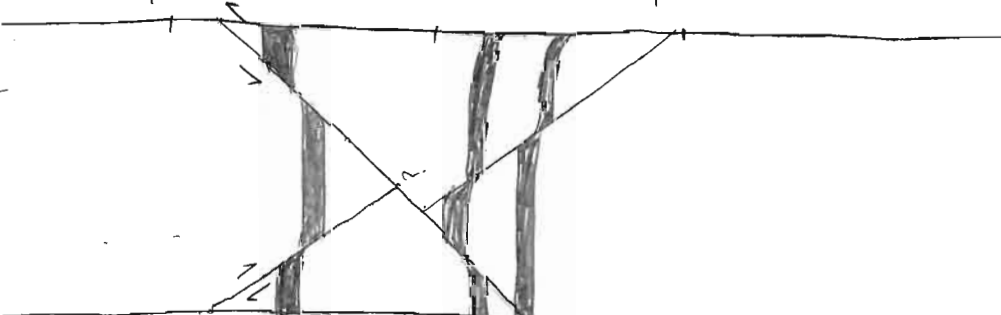
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Exp. 333 Site: C0011D Core: 7014 Observer: A.Y.

Summary:

normal
 minor faults (offset < 1cm) develop throughout the core.
 Shear zones develop sec. 4, 102-116 cm.

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
3	ft.	103	111		270	48	284	0			0	40			offset = 7mm offset = 4mm sec. 4 
	ft.	116	118		90	22	302	0			0	119			
4	ft.	35	43		90	50	88	0			0				
	(normal) ft.	47	50		90	32	70	0							
	(normal) ft.	50	65		99	69	27	0							
	Shear Zone	103	116		90	55	34	0							
6	ft.	40	51		90	56	23	0			0	40			
	(normal) bed.	64	65		270	5	64	0							
7	ft.	62	65		90	25	26	0			0	142			conjugate normal fault. Sec. 8.  offset = 6mm offset = 7mm
	ft.	63	70		90	42	45	0							
	bed.	87	88		270	10	71	0							
8	ft.	48	59		270	64	16	0			0	116			
	ft.	11	19		270	54	30	0							
	ft.	67	76		270	50	36	0							
	ft.	96	102		270	46	45	0							
	ft.	94	105		90	54	310	0							

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Exp.: 333 Site: CodIP Core: T111 Observer: A.Y. Summary: Minor faults & subhorizontal beddings.

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
1	ft.	13	18		270	32	335	0							Minor faults described in cores 9H, 10H are hard to be distinguish: possibly due to progress of lithification? (both VCD&CT)
2	vein structure	47	75												
3	ft.	26	36		90	54	338	0							
	bed.	91	92		270	7	180	6							
6	ft.	60	71		90	92	319	0							
8	ft.	104	106		90	58	0	42							
9	bed.	50	50		90	0	180	3							

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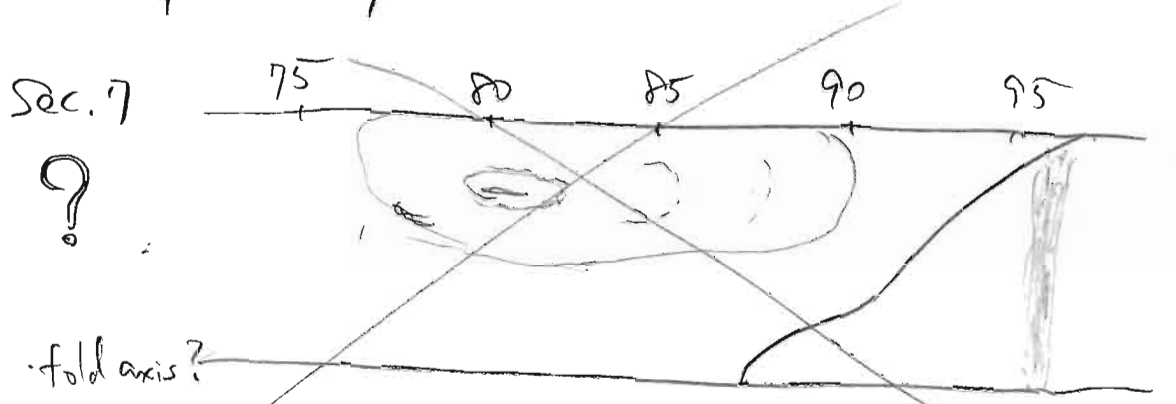
Exp.: 333 Site: Cood/D Core: T2H Observer: A.Y/B.S Summary:

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
1	fault	60	63		270	25									 offset = 3mm.
	Conjugate fault	70	23.5		270	30									
		66	76		90	48									
	Conj. ft	82	91		270	45	180	43							
		81	87		90	41	0	47							
	Conj. ft	113	124		270	55	180	39							
		117	120.5		90	29	0	50							
		126	134		270	50	180	40							
	ft.	10	16		270	46	180	47							
		11	18.5		90	41	0	38							
2	ft. (normal)	14	29		270	72	180	49							
	ft.	23	31		270	17									
	ft.	31	33		270	30									
	ft.	31	37		270	43									
	ft.	41	49		270	51									
	ft.	31	38		270	49	180	60							
	ft.	66	76		90	55	0	40							
3															

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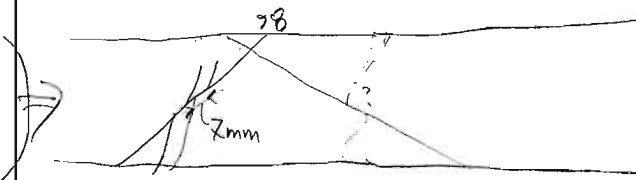
Exp.: 333 Site: Coo11D Core: 12H Observer: AY/BS Summary:

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
3	bedding	119	120		270	8	180	17							many small faults, but they tend to be unclear.
4	fault	6	13		90	53	0	41							
6	bed.	40	41		90	4	180	4							bottom of ash layer.
7	bed.	12	14		90	10	180	7							Sec. 7  ? fold axis? heterogeneous diagenesis → check CT maybe trace fossil
	ft.	112	135		270	170	180	59							
		105	113		90	40	0	41							
8	ft.	128	137		270	54	180	43							
c.c.	ft.	6	11		90	39	0	38							

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No. _____

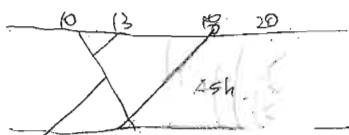
Exp.: 233. Site: COOLID Core: B4 Observer: B.G. Summary: Shear zone w/ veins & minor faults and Normal & conjugate faults

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
1	Fault	69.5	72		270	21	45	0							
	Shear Zone (minor fault vein)	70	131												
2	Fault	16	22.5		270	56									
	N. fault	37	46		270	50									→ 3mm offset ⇒ sort of minor fault.
	Shear zone	0	116												
3	Shear zone	0	79												
4	bedding	15	16.5		90	15	0	28							Ash layer.
6	N. fault	77	42		270	59	177	0							→ 5mm offset. 
	N. fault	77.5	84		270	45	180	54							→ Not clear to measure offset.
	conjugate fault	77	88		90	56	180	54							
		78	84		270	44	0	49							
7	bedding	64.7	65.2		90	5	180	7							Bottom of ash layers. From Sec. # 7. 86cm ~ FCC; flow-Tn.

Structural Geology Observation Sheet

No. _____

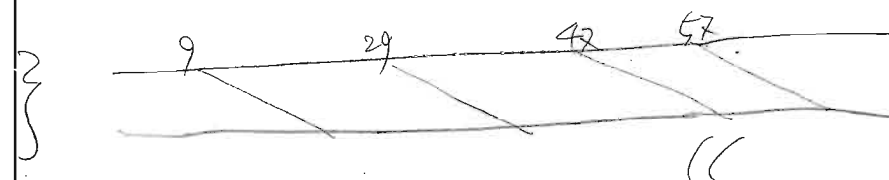
Exp.: 333 Site: COO11D Core: 14H Observer: B.S Summary: Conjugate faults, shear zone with deformed ash & greenish layer

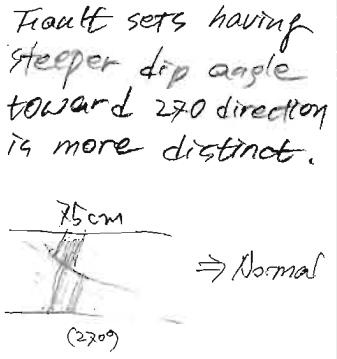
Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
1	bedding	11.2	11.5		90	1	0	2							Bottom of ash layer. [Much easier measurement due to the coarser grain size,
	conjugate fault	21	24.5		270	31	180	56							
		24.5	26.5		90	37	0	49							
2	conjugate fault	131	199		270	49	180	52							
		139.5	209		90	45	0	46							
	Shear Zone	Top to Bottom (0)	140												
3	fault	52.5	62.5		270	36	180	40							Bottom of deformed ash layers, Greenish layer. Greenish layer.
	bedding	115.3	115.5		90	2	0	16							
	bedding	130	130.5		270	5	0	14							
4	bedding	147	15		90	2	0	9							 Bottom of deformed ash layers having conjugate faults.
6	conjugate fault	10.7	13		270	12	180	49							
		12	18		90	35	0	48							
	bedding	19	20		90	5	0	15							
	shear Z.	42	144												
CT → 8	bedding	57	57		0	0									

Structural Geology Observation Sheet

No. _____

Exp.: 333 Site: COOLID Core: 15H Observer: B. G Summary: ^{Fracture} Tilted greenish layers (dominant) & ash layers.

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
1.	bedding	79	80.5		90	15	180	24							Ash layer.
	fault	98	105		270	52	180	50							
2.	bedding	54.5	56		90	16	180	7							Bottom of ash layer.
	conjugate fault	29	37		270	55	180	62							 Fault sets having steeper dip angle toward 270 direction is more distinct.
		26	39		90	65	180	46							
6.	bedding	94.5	94.5		90	13	180	12							Bottom of ash layer.
7.	conjugate fault	76	82		90	61	0	60							COOLID15H07 60-82cm
		83	88		270	48	180	53							
	shear zone (shearband (offset: 10mm))	0	140												
8.	bedding	9.5	11		90	15	180	10							Bottom of ash layer.



Structural Geology Observation Sheet

No. _____

Exp.: 333 Site: Coolidge Core: 16H Observer: A.Y. Summary: Dip-slip normal faults

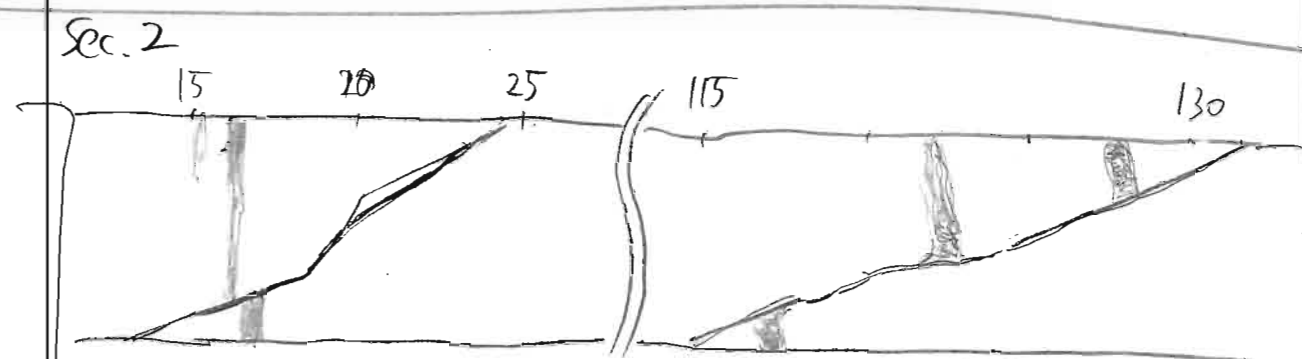
Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
1	fault	44	50		90	40	24	0							
	ft.	60	67		90	46	8	0							
2	ft.	20	23		90	38	4	0							
	ft.	20	27		90	56	330	0							
3	ft.	23	36		90	61	340	0							
	ft.	35	41		90	31	358	0							
	ft. (normal)	64	73		90	53	15	0							
4	ft.	30	40		90	58	333	0							← offset = 1.9 cm. * c.T.
5	ft.	0	11		90	71	18	0							
	ft.	11	20		270	53	336	0							
	ft.	31	39		90	63	3	0							
	ft.	43	50		90	54	12	0							
	ft.	50	56		270	46	19	0							
	ft.	95	106		90	59	30	0							

← offset = 8 mm.

These fault planes are aparted; maybe due to replacing liners. But they appear to possess original orientations. Dip-slip slickens are often observed in their surfaces. (normal-fault - sense of shear)

Structural Geology Observation Sheet

Exp.: 333 Site: CoolID Core: 1614 Observer: A. Y. Summary: High-angle normal faults with relatively large offsets. (Sec. 2-3) especially No. _____

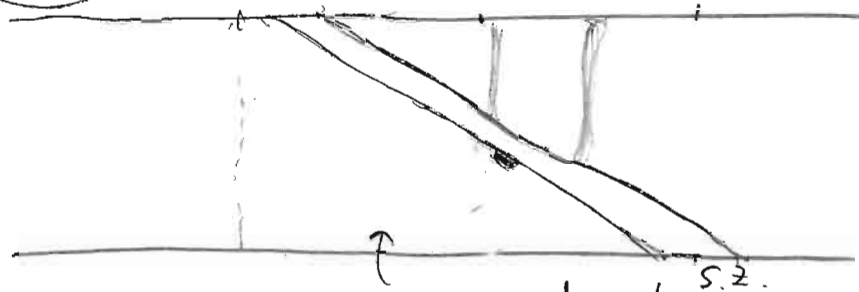
Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
1614	6	fe.	6	15	90	37	41	0							sec. 6 115 cm ~ core bottom: flow-in.
		fe.	16	21	270	39	311	0	20	90					
		fe.	51	57	90	45	35	0							
		fe.	79	87	90	51	39	0							
1714	1	fe.	39	79	90	79	37	0							Sec. 2  * Relatively larger offsets than previous cores. → offset = at least 5cm maybe * Fault planes are filled with > 2mm-thick dark material. * Well-oriented, systematically developed in every ~ 50cm interval. sec. 9 59cm ~ core bottom: flow-in.
	2	fe.	14	24	90	56	39	0							
		fe.	66	73	90	46	56	0							
		fe.	75	87	90	51	70	0							
		fe.	116	132	90	70	29	0							
	3	fe.	11	21	90	54	41	0							
		fe.	39	44	90	33	47	0							
		fe.	57	70	90	60	29	0							
		fe.	96	113	270	62	303	0							
	4	bed.	6	7	270	8	0	13							

between
two fcs:
high C thrust

Structural Geology Observation Sheet

No.

Exp.: 333 Site: Cool Core: 784 Observer: A.Y. Summary: Gently dipping beddings, normal fault and shear zones.

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
2	fault (normal)	71	79		270	39	32	0							offset = 3 mm. (Sec. 5)  offset = 7 mm offset = 4 mm
5	shear zone	21	30		270	56	46	0							
	fe. (normal)	103	108		270	45	29	0							
6	bed.	28	30		90	13	52	0							
	fe. (normal)	81	90		270	47	11	0							
	bed.	106	108		90	16	56	0							
7	fe. (N)	36	46		270	62	29	0							
	fe. (N)	50	58		270	56	25	0							
	shear zone	88	93		90	29	306	0							

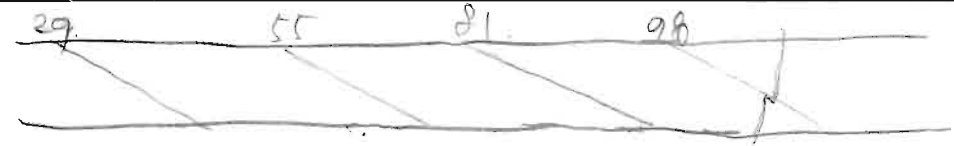
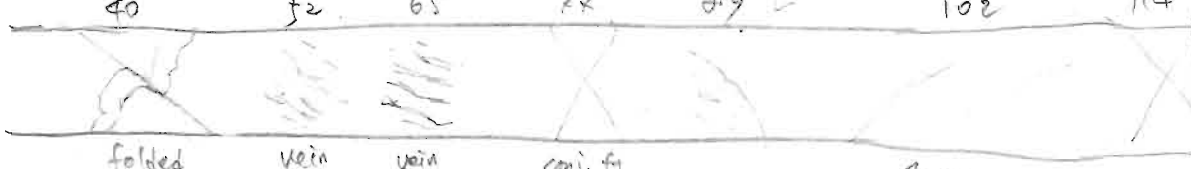
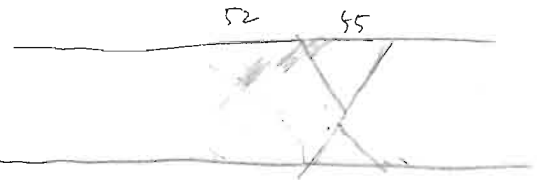
observation & measurement using thick slab mode

CHIKYU Operation
Dec 24, 2010

Structural Geology Observation Sheet

No. ...

Exp.: 333 Site: COOLID Core: 19H Observer: B.S Summary: shear zone & faults (normal? or reverse?)

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
1	fault	55	62		220	44	180	44							#1 29 55 81 98 
2	shear band	29	42.5		90	24									#2, shear zone → fold, vein, & conjugate ft
conj.	fault	20.5	20		90	39	0	54							40 52 65 77 89 
	fault	25	29		270	32	180	53							vein? check C7 102 114
	fault	110.5	112		270	42	180	48							folded shear band vein vein conj. ft shear localization
4	shear zone	28	39		270	60	180	60							
5	bedding	9.5	12.5		90	26	0	10							Bottom of ash layers
	shear band	49	54		90	28									
	conj. fault	54.5	59		90	42	0	44							
6	fault	53	58		270	43	180	51							
	shear band	35	39		90	21									
7	fault	108.5	115		90	50	0	24							
	fault	64	72.5		270	54	180	36							sec. #7 & cc : flow-in.

Dec 24, 2010

Structural Geology Observation Sheet

No.

Exp.: 333 Site: CO011D Core: 20H Observer: B.G Summary: conjugate fault with high angle dip on working core surface & shear zone

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
1	conj. fault	9.5	14.5		270	27	180	48							
		10.5	18		90	37	90	42							
2	fault	64	70		270	59	180	54							
	bedding	127	128.5		270	12	0	12							Top of ash layers
	bedding	130	131.5		270	15	0	14							bottom of ash layers
3	shear zone	71	109		90	79	180	74							
	fault	99	108.5		270	54	180	48							
5	fault	106	113		90	49	0	56							
	conj. fault	107	117.5		270	54	180	42							
6	fault	137	21		270	47	180	31							
	bedding	20.5	92		270	23	0	19							

Structural Geology Observation Sheet

No. _____

Exp.: 333 Site: COOLID Core: 21H/22H Observer: B. S. Summary: Shear zone & faults

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
21H	1	Conjugate fault	44 42	48 50	270 90	30 36	180 0	47 38							
	2	fault	28	33	270	39	180	35							
		Shear zone	30	40	90	54	180	53							
		bedding	63	65	90	22	180	8							Bottom of ash layers.
	5	Shear zone	30.5	47	270	63	180	38							
22H		Normal fault	23	82	270	49	180	54							offset: 8mm ↓ sec. #6 25cm ~ : flow-in
	1	Conjugate fault	69 23	27.5 27	270 90	46 33	180 0	51 31							
	2	bedding	24.5	32.5	270	29	180	5							Bottom of ash layer. Below ash layer : Flow-in ↓

Structural Geology Observation Sheet

No. _____

Exp.: 333 Site: Coo 11D Core: 23T Observer: A.Y. Summary:

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes	
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip		
23T	1	bedding	56	57		90	7	0	10						Sec. 1 ~ 2 : highly bisected by EPCS coring Sec. 3 : high angle faults.	
	3	fault	56	62		270	45	57	0							
		ft	71	79		90	50	22	0							
24T															Nothing to describe because of intense coring-induced brecciation.	Quality of EPCS cores is very bad.
25T	4	bedding	78	79		270	22	180	19						bottom of ash layer.	
26X	2	bed.	4	5		270	9	297	0			2	8	57	-69.1	
	4	bed.	92	93		270	23	13	0			90	94	58.9	-35.2	
	5	bed.	44	46		270	22	324	0			41	49	-161	-32.2	
	6	bed.	134	136		270	20	180	19			132	139	-41.2	67.4	
	7	bed.	19	20		270	13	70	0			18	25	12.4	74.5	
27X																Inclined beds, but NO good pieces for structural measurement.

Structural Geology Observation Sheet

No. . .

Exp.: 333 Site: C0011D Core: 28X Observer: B.S Summary: highly brecciated & biscuitted

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
28X	3	fault	127	140	90	57	180	60							highly biscuitted through all sections of core 28X. subhorizontal layers in coherent pieces (max. length: 6~7cm) ↳ but, not able to measure any structure high angle fault. - Ash layer
	4	bedding	85.5	87	270	7	0	0							
29X	3	bedding	66.5	67.5	90	7	180	6							highly biscuitted (max. length of 5 to 6 cm in coherent pieces) subhorizontal beds, --- hard to measure structures, breccia at the top of sect. 1 (0~45 cm) - Bottom of ash layer. * P-mag: sec 1 125~130 cm sec 2 35~38 cm / ← check it to Yujin
30X	3	bedding	128	129	90	21	0	14			125	132	79.5	48.5	highly shattered: Breccia in sect. 1 max. length of coherency: ~6cm (but most of biscuits are shorter than them of core 29X) thick ash layers → not measurable (about 15 cm & 24 cm)
31X	5	bedding	105	106	270	10	180	12			95	100			slightly tilted beds (greenish layers) in coherent pieces (max. length: 6~7cm) Bottom of ash layers
	6	bedding	46	47	270	3	0	4							

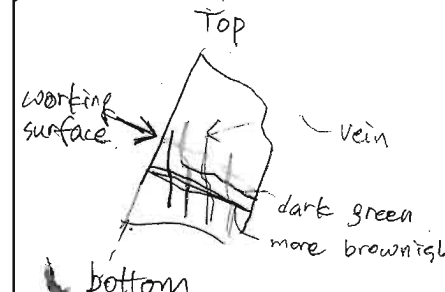
Dec. 26, 2010

CHIKYU Operation

Structural Geology Observation Sheet

No. _____

Exp.: 333 Site: G011D Core: 32X~34X Observer: A. T/B Summary: shear zone with low-angle dark seams

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
32X	3	bedding	10	11		270	15	180	5		8	15			biscuit size: up to 5cm. low-angle dark seam (shear zone)
	1	dark layer	70	72		270	13	130	0		70	76			
33X	4	dark layer	63	67		90	5	0	13						X Low-angle dark seams started to appear from 32X. They show bright color on CT images, and look like "deformation band", "shear zone" and "healed fault" described during exp. 316.
34X	1	bedding	120.5	122.5		270	12	180	7						Greenish layers dark gray band (showing light color on CT image.)
		dark layer	132	133.5		90	10	0	4		130.5	135	135.3	55.6	
	3	bedding	8.5	10		180	19	0	8						 looking like shear zone with stylolites & veins
	5	bedding	103.5	103.5		0	0	180	13						
		dark layer	116	117		90	3	180	4		113.5	119	116.2	30.2	dark seams - not clearly shown on CT images because each seam is not thick enough - Rotation? In the upper part of this biscuit, there are subvertical def'd(?) greenish layers at 8mm below into working surface
	6	bedding	5	6		90	4	0	10						

Dec 26, 2010

CHIKYU Operation

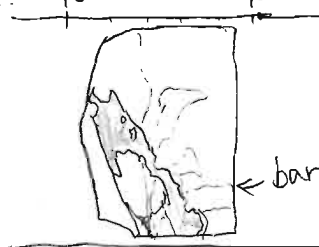
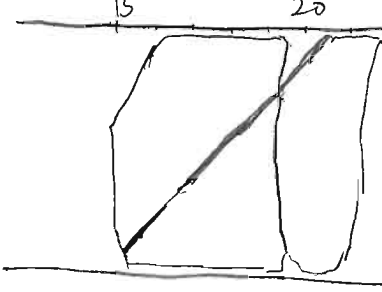
Structural Geology Observation Sheet

Exp.: 333 Site: COO11D Core: 35X~ Observer: B.S./A.I. Summary:

36X ① 30-53
 ② 10-14
 ③ 129-133

41
 #2
 129
 135

#8 29 cart #211
 40. } green 128
 52 } 1265
 72 No. 1265
 #8 35?

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
35X	1 bedding	68	68.5		270	7	180	1			66.5	70			Bottom of greenish layers Only sect. 1 & CC due to replaced liner In sect. 1 & CC, most of coherent pieces have deformed bands (green) brown
36X	1 dark layer	51	52		90	12	180	29			50	53			def'd layers (brown & green) Max. biscuit size: 4.5~5 cm Tilted biscuits  Deformed & naturally disturbed greenish layers, dark seams, clasts => indicating submarine landslide?
	4 bedding	30	33		90	15	180	13			29	33			
	dark layer	47.3	47.5		270	3	180	5							
	6 bedding	18.5	19.5		90	5	180	7			55	61			
	dark layer	21.5	23		270	8	180	7							
	7 dark layer	31	31.5		90	9	180	3							Greenish layers
37X	5 dark layer	75	78		90	29	33	0							Sec. 5  ← Top ← barrow. dark zone truncates barrows. biscuit size: up to 8 cm several dark layers. Sec. 5 75-78m & sec. 6 16-21m maybe faults sec. 5 91-94m: formed by hydrofracturing?
	dark zone	91	94	top	270	22	47	0							
				bottom	270	27	28	0							
	6 dark layer	16	21		90	40	180	2			15	21	111.9	56.7	Sec. 6  P-MAG & P-WVD was taken from this piece.

Dec. 27, 2010.

CHIKYU Operation

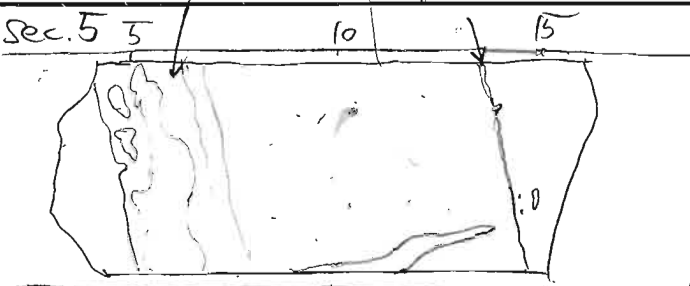
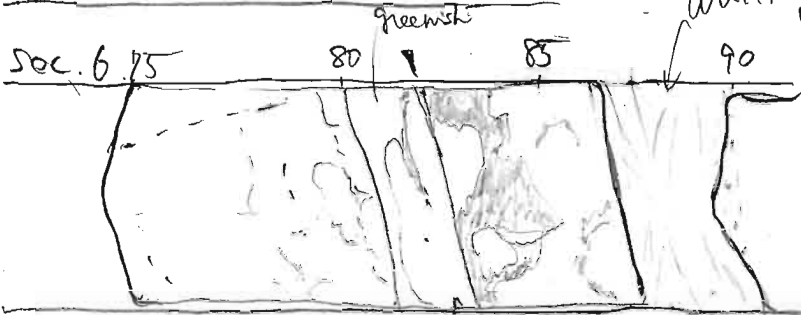
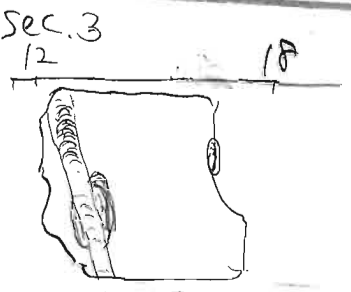
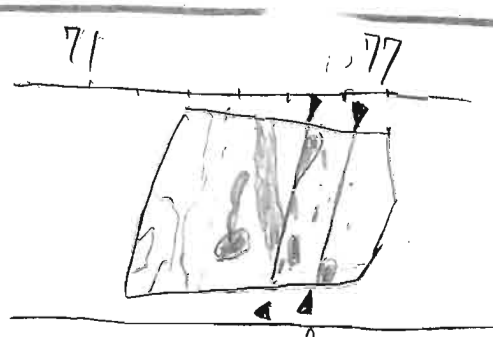
Structural Geology Observation Sheet

No. _____

Exp.: 333 Site: CoolID Core: 38X~39X Observer: A.Y. Summary:

Highly bioturbated

38X

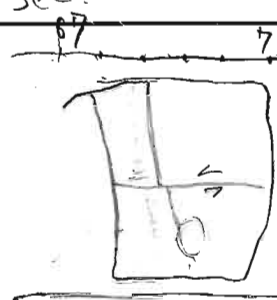
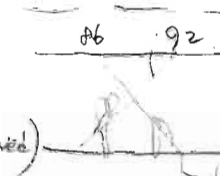
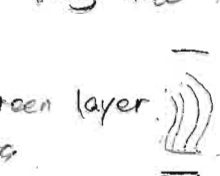
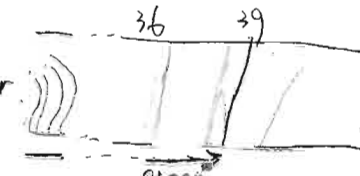
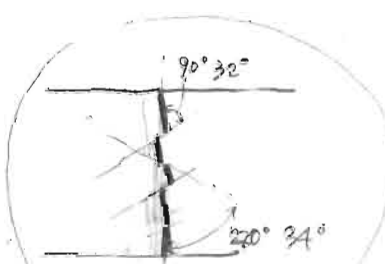
Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
2	bed.	39	41		270	29	303	0							 Sec. 5 5 10 15 greenish greenish P-MAG taken!!
5	bed.	13	14		270	29	336	0			3	16	-116.7	-56.8	
6	breccia	75	86		270	14	180	1			75	87	-110.1	-73.5	
	fault	82	84												 Sec. 6 75 80 85 90 greenish drilling mud (ash) fault breccia truncated by fault. Drilling disturbance is still heavy, but some pieces have enough length (>10 cm). Tilted beds & layer-parallel faults are observed.
3	fault	74	75		90	8	297	0							 Sec. 3 12 18 black ellipsoidal ore is cut by zoophycos (trace fossil) -> should be formed just after sedimentation
		75	76		90	7	292	0							
															 71 77 faults.

39X

CH!KYU Operation

N

Thick green layers with deformed dark seams
Shear zone with deformed (partly folded?) green & dark layer & faults

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes	
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip		
6	fault	68	71		90	87									offset = 1 mm	sec. 6  offset = 2 mm
8	fault	29	30		90	38										
1	dark layers	9.5	10.5		90	5										leg #1  reverse sense folded  shear zone & conj. faults? (not clearly observed)  dark seam developed through fault?  highly deformed and mixed green & dark layers
2	dark layers	54.5	55.5		270	8										
	shear zone	76	83		270	49										
conj. fault	86	89.5		90	38											
fault	82.5	93		270	31											
dark layers				270	8											
conj. fault				270	42											
				90	45	180	29									
3	bedding	38	39		90	9	180	9								In sect. 3, one long size biscuit with length of 18cm (from 42 to 60)  Bottom of a thick (13cm) green layer with dark layers  subparallel green & dark layers
4	bedding	47.5	48		270	4	180	16								
6	dark layer	68			90	3										
7	dark layer	20.5	21		270	9										
8	shear zone	35.5	36.5		270	6										conjugate minor normal fault → offset 12mm 

VCD_sheet_str100805.xls

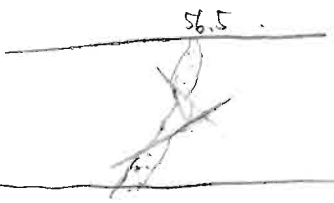
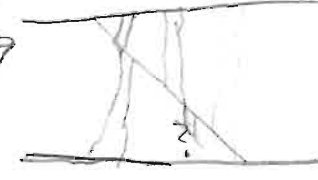
Dec 27, 2010

CHIKYU Operation

Structural Geology Observation Sheet

No. . .

Exp.: 333 Site: C0011D Core: 41X Observer: B. S. Summary: Highly bioturbated, Deformed layers (shear zone & minor ft)

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
1	bedding	87	87.5		270	9	180	7			84	90			Green layer
	dark layer	111.5	112.5		270	4									 deformed dark seam
	bedding	124.3	124.5		270	2									with deformed layer
2	dark layer	132	133		90	4					131	141			green bio-disturbed layers
3	bedding	16	16.5		90	3					12	18			
4?	N. fault	37	43		270	54	180	66							→ offset: 9mm
?	fault	55	58.5		270	47 42									
?	fault				90	47 63		which one?							
6	bedding	72	73		270	11					69	72			
	bedding	84	86		270	9	0	3							dark layer with deformed layers (clearly shown by CT-image)
	bedding	90	90.5		90	7	180	10							
7	fault	6	10.5		270	37									
	bedding	36	37.5		90	7					33	42			
	Shear zone	37	41		90	55									
8	bedding	25.5	26.5		270	4									← Not clear to observe

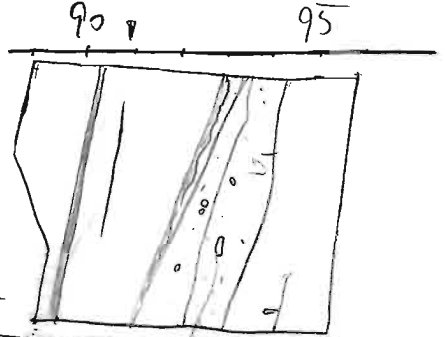
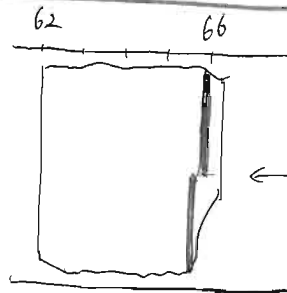
Dec. 28, 2010

CHIKYU Operation

Structural Geology Observation Sheet

No.

Exp.: 333 Site: CoolID Core: 41X-44X Observer: A.Y. Summary:

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
41X	6	mineral vein	91	92	90	11	80	13							 Core quality is relatively good White mineral vein (calcite?), sponges are not deformed
42X	3	bed.	2	4	270	7	0	13			1	8			bottom of ash layer. * several tilted beddings in browned greenish sediments.
		bed.	90	91	90	3	0	13			88	92			
	5	bed.	30	31	90	9	0	22							
43X	2	dark layer	65	66							62	66			 ← displaced by minor normal fault offset = 1 mm * Deformation (low-angle shear zone / fault) appears to be weaker than that of site C0006/C0007 (exp 316)
44X	1	dark layer	49	50	270	12	0	6			46	52			← bright color in CT.
	2	bed.	62	63	90	0	180	13			62	66	130.9	45.7	bottom of browned ash layer.
	3	bed.	26	27	90	6									

Structural Geology Observation Sheet

No. _____

Exp.: 333

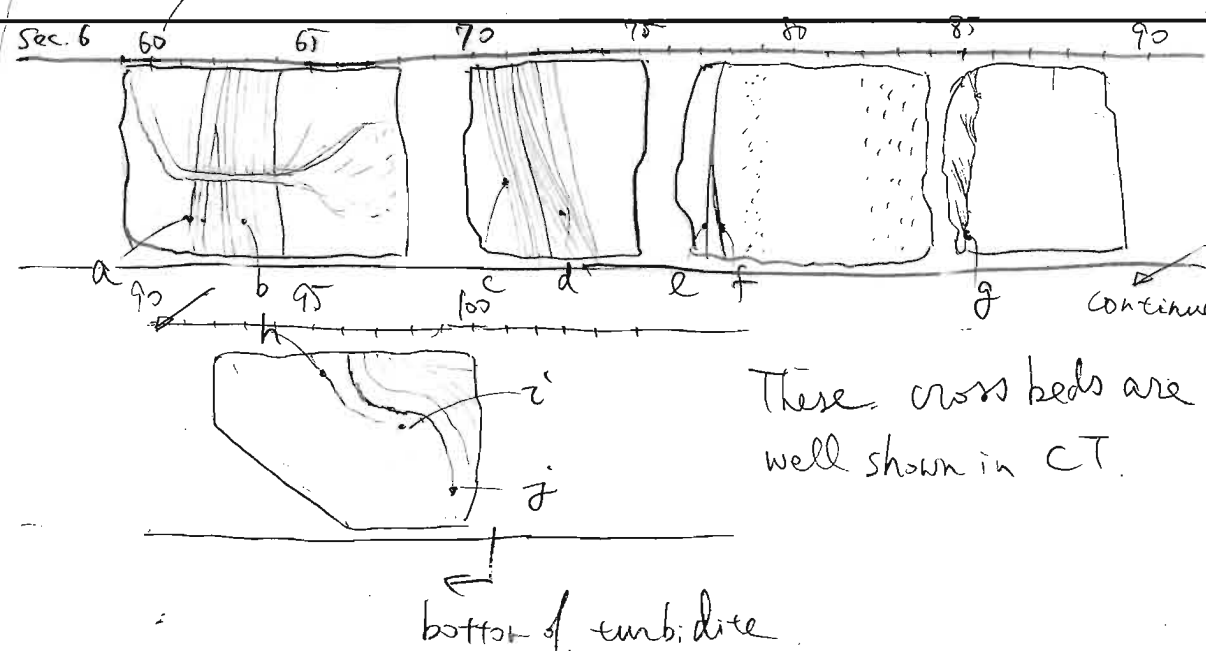
Site: Coo/D Core: 44X-45X

Observer: A.Y.

Summary:

44cm ~ parallel lamination

cylindrical shape

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
44X	bed (a)	61	62		90	8	297	0			59	68			 These cross beds are well shown in CT. bottom of turbidite * sec. 1 ~ 5: greenish mud sec. 6: turbidite with beautiful cross lamination.
	bed (b)	63	64		270	1	87	0							
	bed (c)	71	71		270	11	50	0			70	76			
	bed (d)	72	73		270	24	45	0							
	bed (e)	77	77		90	10	20	0			77	84			
	bed (f)	77	78		270	1	271	0							
	bed (g)	85	85		90	3	180	2			84	90			
	bed (h)	95	95		270	22	18	0			92	100			
	bed (i)	97	98		270	68	16	0							
	bed (j)	99	99		270	24	17	0							
	denaturing structure	60	68												
45X	bed	75	75		90	1	180	9			71	79			* core condition is worse than 44X. (bisecting, coherent piece length < 10cm, mostly < 5cm) highly browned.
	cc bed	22	23		90	8	180	1			20	25			

Dec 28, 2010 (Tue)

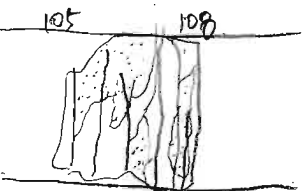
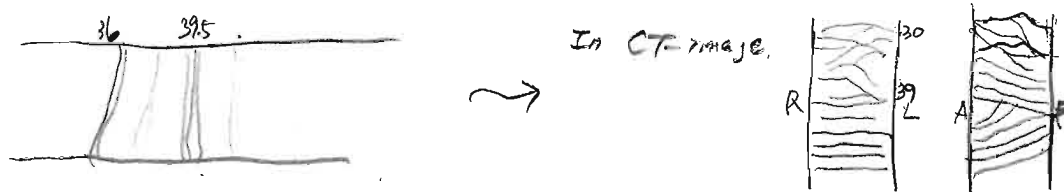
CHIKYU Operation

Structural Geology Observation Sheet

No. _____

Exp.: 333 Site: COO11D Core: 46X Observer: B.G. Summary: sand beds from 77cm depth of Sect. 4. with clasts (getting coarser with depth increments)

clasts getting coarser w/ depth increments

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
1	bedding	105	105.5		90	2	0	3			104.5	108			Sect #1: mostly destroyed and partly watery by coring rotated biscuit with max. length of 5~5.5cm (most of biscuit size: < 3cm)  Subhorizontal lamination.
2	bedding	92.1	92.3		90	2	180	5							Green layer w/ dark seams,
4	bedding	77.3	77.5		270	1	0	5							Sect #4, From 77cm: sand unit (most upper part from 72 to 110: organic rich?) measured from the sharp boundary of the last mud biscuit but, not sure it is real sedimentary boundary or not.
5	bedding	12	13		90	10	0	5							Sect #4, Below 110cm: sand w/ 1~3mm green & white clasts (pumice? c. lower density)
	bedding	20	20.5		270	2	180	9							top of disturbed greenish layer.
	bedding	36	37		90	14	180	8							yellow tint layer.
	bedding	39.4	39.5		90	1	0	12							 sec. #cc: coarser clasts (< 5~6mm)

Dec 28, 2010 (Tue)

CHIKYU Operation

Structural Geology Observation Sheet

No.

Exp.: 333 Site: C00117 Core: 42X Observer: B.G Summary: Mud & sand beds, Pumice clasts & pyrite in sands.

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
1	bedding	9.5	10		90	4	180	1							- highly brecciated. (specially 27~58cm of sec. 2 & 73cm of sec 7 to CC) - vertical crack in sand beds, & horizontal - small size (max. length of 3.5cm, but mostly smaller than 2cm) & rotated braccuts in mud beds, Greenish & brown tint layers in mud biscuits and trace fossils - Bottom of mud - thick sand bed (from sec 1, 10cm to sec 2, 26.5cm) 13~19cm & 34~44cm green & white clast rich.
2	bedding	27	28		270	3	0	11							Bottom of sand's
6	bedding	18.5	18.5		90	7	0	1							Bottom of mud's with dark layer
	bedding	37	37.5		270	5	0	4							dark layer in organic rich (?) sand layers. --> sand layer from 33cm to 113cm depth showing dark & bright bands in CT image.
7	bedding	19	19.5		90	9	180	16							top of coarser grain size (1~3mm) sand layer (2.5cm thick)
	bedding	26?	27?		90	7	180	8							- Top of mud - Below this depth, totally broken down.
															* What is the bright spots around 4~6cm depth of sec 7? → pyrite ☺

Structural Geology Observation Sheet

No. _____

Exp.: 333 Site: C0011D Core: 48X Observer: BS

Summary: *mostly sand beds with green & white clasts.*
Disturbed boundary b/w mud & sand beds (because of brecciation during coring or original disturbance?)
& tilted

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
1	bedding	9.3	9.2		270	4	0	0							- Bottom of mud bed. 9~15cm: green & white clasts. (size: 2~5mm)
	bedding	49	50		270	9	180	8							- Bottom of sand bed.
	bedding	76	76.5		90	6	180	3							- Bottom of muds.
2	bedding	62.5	64		90	13	0	12							- Bottom of sands. (57~62.5cm: clasts up to 9mm of diameter)
	bedding	77	78		270	9	0	5							- Bottom of muds. 80~91cm: clasts in sand beds. (<18mm)
4	bedding	3	6.5		270	43	180	11							- Bottom of muds
	bedding	16	18.5		270	20	180	34							- Bottom of sands
	bedding	21	22.5		270	14	0	23							- dark layer
															↓ sec. 5 ~ CC: sand (clast size: < 20mm)
															Through all sections, mud: brecciated sand: cracked.

Dec 29, 2010

CHIKYU Operation

Structural Geology Observation Sheet

No.

Exp.: 333 Site: Coolidge Core: 49X-52X Observer: A.Y. Summary:

Section No.	Structure ID	Top of Struct	Bottom of Struct	ave. depth	Core face app. Dip		2nd app. Dip		Striation on surface		Coherent interval (for P-mag)		P-mag pole		notes
					az.	dip	az.	dip	rake	from	top	bottom	az./trend	dip	
49X	2	bedding	17	18		270 5	180 12								* Inclined beds.
	4	bed.	16	17		270 5	180 11				16	43			} long coherent piece!!
		bed.	39	40		270 4	180 9				16	43			
															sec. 5 56m ~ bottom sec. 6 0-30cm & cc { sand (similar to 49X)
50X															thick sand & conglomerate (sec. 2 60m ~ sec. 3 108m) No structure.
51X															No structure (sand & conglomerate).
52X	1	bed.	34	34		270 2	180 44								bottom of sand, return to greenish mud.
		bed.	127	128		90 6	0 8								
															7-72