

MARCELLUS SHALE at MONONGALIA-6, WV

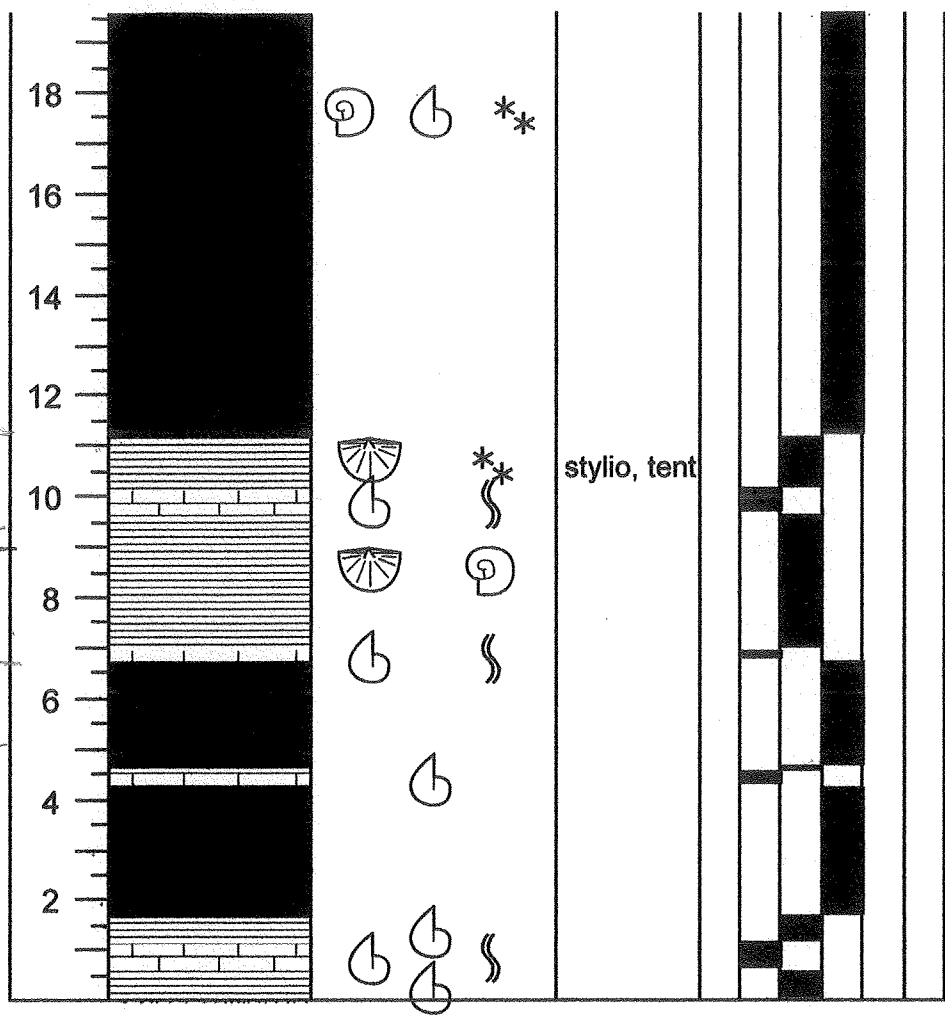
SCALE (m)	LITHOLOGY	FOSSILS	NOTES	FACIES						
				1	2	3	4	5	6	
42	[Dotted pattern]	☉	silty, gray-black							
40										
38	[Dotted pattern]	** ☉	stylio, tent							
36										
34	[Horizontal lines]	** ☉ ☉	trilobite							
32	[Horizontal lines]	☉ ☉ ** ☉								
30	[Horizontal lines]	** ☉ ☉ ☉	tent, stylio							
28	[Horizontal lines]	☉ ☉ ☉ **								
26	[Horizontal lines]	☉ ☉ ** ☉								
24	[Horizontal lines]	☉ ☉ **								
22	[Horizontal lines]									
20	[Horizontal lines]									

7361
 top M
 7388
 7404
 7409
 7418
 7426

silty
 91 + 51K SH
 81.9 = linguloid brach
 7401-09 plants, brachs
 7411-12 orbic inart brachs
 ? chiton, limpet?
 7420 = ostra
 orthro = cephalo
 19 = inart brach
 24 = ostra
 7445 = fish scale, py fossils

☉

F
 7463
 C
 7477
 C
 7494
 7499



stylio, tent

7485 = ^{A+} brach
 79 = pyr ant brach
 85 = brach
 95 = ? pD-y fossils
 95-00 - Poy fossils

u
 u'

WV6
 Mon Co


Unit	Depth	Clay	Silt	Sand					Gravel			Symbols	Description	
				vf	f	m	c	vc	g	c	p			b
	7360													
	7361													0.1 Dk qy, non calc, non-fossil sh silt size mica
														7361 written on core Block 7361.1-61.35 Block 7361.23-61.61 Block 7361.6-61.75
	7362													7361.8 - 7362.55 Dk qy to black on bedding planes Terratek
														Block 7362.3-62.7 Terratek ?
	7363													1.2' to 7362.8 dkgy marginally calc. shale no fossils spalling @ 63.2 ends fracture Fracture continues interrupted by slickensides
														7363 written on core
	7364													1.2' continued (sections 1-18) slickensides @ 7364

some sections in this box out of order

fracture

WV6
Mon Co

Box 66 7367 - 7364
Box 67 7370 - 7367

Unit	Depth	Clay	Silt	Sand					Gravel				Symbols	Description	
				vf	f	m	c	vc	g	c	p	b			
Unit finely disseminated Coq shale	7365	✓	fracture #8												<p>1.2' to 7364' ~ Fract N 12° E dip 75° (or S 12° W (north not marked used + on core) # 8 c 7365.0 Unknown </p> <p>Block <u>Towatek</u> 7365.1 - 65.4 Block 7365.4 - 65.5</p> <p>7366 written on core Block 7366.1 - 66.35 Block 7366.36 - 66.8</p>
	7366	✓													<p>0.65 to 7365.4 ~ V. slightly calc to non-calc dk gy shale - CO₂ < 0 ~ 65.7 no fossils. CO₂ finely disseminated</p>
	7367	✓	HHH I												<p>0.2' dk gy, slightly calc. sh, competent</p> <p>dk gy, calc. sh, competent > P, CO₂ finely disseminated - ? micron size fossils</p> <p>low L CO₂ filled fault slickensides c 7367 - along base of small core of disseminated pyrite cubes adj to fault</p>
	7368	✓	T T T												<p>N 13° W near vertical ~ 30° SE 0.7' appears slabbed - vertical fract M-size fossils</p>
	7369	✓	X												<p>Block 7369.05 - 69.25</p>
24	7370													<p>~ 0.2' dk gy calc. sh. CO₂ finely disseminated throughout - silt size no discernable fossils Bag chip 7370 - 7369</p> <p>Very slightly calcareous</p>	

Box 68 7373 - 7370

Box 69 7376 - 7373

Unit	Depth	Clay	Silt	Sand					Gravel				Symbols	Description	
				v	f	m	c	vc	g	c	p	b			
	7370														0.2' to 7370 dk gy sh non calc non fossil one bed 0.01' nubby ostracodes? clams? calcareous, entire bed
	7371														Block 7370.9 - 7371.05 Block 7371.05 - 71.3 Block 7371.30 - 71.76
	7372														7372 written on core 0.95' to 7371.75(1-11) dk gy non-calc, non fossil sh x in mica, sparkly circle disc @ from 7372 - 71.75
	7373														7373 on core 0.1' dkgy non-calc sh, no fossils homogeneous
	7374														Block 7373.7 - 7374.5 Concretion bag of chips (unmarked) 0.5' to 7374 written on core
	7375														fract CO ₂ filled NE SE \odot vertical 0.1' x CO ₂ fossil to sharp contact w/ concretions scattered tentacs, shell frag @ 7375.0 u fracture due E-W

Concretion



calcite
marker
base

Box 69

Box 70 7379 - 7376

Box 71

Unit	Depth	Clay	Silt	Sand					Gravel				Symbols	Description		
				vf	f	m	c	vc	g	c	p	b				
	7376	X													Block 7375.55 - 75.85 7376 written on cone Block 7376.04 - 76.42	0.2 Homog blk/dk sh Some shiny coarser bedding planes
	7377	X													Block 7376.45 - 76.78	0.07' slickensides NS2W CO3 spots on face Homog
	7378														Line	Continuous 1-14 to 7376.75 Blk, dk gy homogeneous shale
	7379	X													Block 7378.32 - 78.61	0.35 Blk sh, homogeneous, non calc non-fossilif. (1-3)
	7380	X													Block 7378.32 - 78.61	0.1' Homog blk sh non-cal, non fossil.
	7381	X													Block 7380.01 - 80.2	Small bag of rubble 7379-7380 0.6' 1/2 core sections ~0.4' rubble 2 larger sections ~0.1' Homogeneous Blk shale non-calc no fossils




Box 71 7382-7379

Box 72 7385-73821



Unit	Depth	Clay	Silt	Sand					Gravel			Symbols	Description
				vf	f	m	c	vc	g	c	p		
Unit 2.3	7381			7381 written on core					Block 7381.1 - 81.5				0.15 Homog blk sh
													Rubble in small bag 7381 - 7382 Homogeneous blk sh
Unit 2.3	7382			7381.7 - 81.9 block					7382 on core				0.1 to 7381.9 0.4' to 7382 - homogeneous blk/dk gy sh non-calc, non-fossil.
													0.3' rubble to 82.5 fracture N78°E large brachs 1cm carb filled
Unit 2.3	7383												0.55 to 82.8' (1-7) blk dk gy softer, finer sh, non-calc, no fossils - small circular shiny particles #6 top
													Rubble to 83.35 ~ 0.5' blk/dk gy sparkly shale ? silt, v.f particles - soft white clay, - oxidized orange non-calc, no fossils
Unit 2.3	7384												0.1 7384 - 7385 rubble in small bag blk dk gy non fossil, non-calc some pieces - silt size particles other pieces - soft, finer
													0.4' to 7385 (9-11) oxidized silt-size particles
Unit 2.3	7385												0.2 non calc, non fossil silty? (6-8) 0.4 non calc, non fossil blk sh (1-5) sparkly → micaceous
Unit 2.2	7386			Block 73860 - 86.3									
			missing										

shiny dot particles throughout






Unit 22 calc blk/gy sh fossil
Unit 21 non calc blk sh fossil
Unit 20 Non calc blk shale

Unit	Depth	Clay	Silt	Sand				Gravel			Symbols	Description
				vf	f	m	c	vc	g	c		
	7387										isolated  TS 7387	0.5' non cal blk sh @ non-cal fossils becoming > calc to top of concretion sparkly - micaceous? random directions 
	7388										Concretion 7388 written on core Block 7388.25 - 88.58 TS 7388.6 7388.7	0.35 to conc fractured, burrowed? 0.35 to 7388 (1-4) > tentacles top #3 
	7389										noncal w/ no-name fossils, fossil > in diversity up - slightly calc @ 88.2 - 94 ls @ 88.0 0.75' ? fossil? non-calc blk sh (1-11) fossil same - not as abundant as in p. 61: below Top 6 circled fossils 0.6' non calc - fossil? ostracodes? plants Top #5 smooth bedding plane w/ lines fossilif non-calc (minutely calc #3) shiny, abundant impressions abundant imprints base #1 what are these? 0.8' non-calc blk sh numbered 1-12 Abundant circular imprint top #10 Base #7 plant fossil (circled) some limonite filled (stem) oxidized holes imprints	
	7390										* check for sparkly appearance Top #1 some limonite filled	
	7391		0.2'								Block 7391.0 - 91.1 Block 7391.1 - 7391.35 oxidized holes imprints	Non cal. black sh ostrac? plant fossils scattered ostracode imprint bed @ 91.4 @ Calcite hor? fract? @ 91.85 - abundant plant seeds, ostracodes?

TS 7387 lt. grey fossilif concretion
 TS 7388.7 dk gy blk fossil non calc shale

Unit	Depth	Clay	Silt	Sand				Gravel			Symbols	Description
				vf	f	m	c	vc	g	c		
	7392											0.5' non calc blk sh fossil small round plant?
											 shiny	0.2' sharp contact along slickensided calcite
											 concretion	0.3' fract fill - horin - non calc blk sh / A tentac concretion, tiny fossils - globular? ostrac? Fracture curved, feathered, offset, 2 gen cement
	7393											Block 7393.0 - 93.55
												0.2' blk sh, fractured low L filled w CO ₂ base of concretion, no fossils, points of CO ₂
												0.1'
	7394											0.9' to 7394 non calc, non fossil blk sh shiny dots circular features
												#1 TS 7394.35 - 94.4
												TS 7394.4
												top and bottom section #1
	7395											Block 7395.0 - 95.2 Block 7395.2 - 95.46 Block 7395.46 - 95.7
												0.75' to 7395.5 non calc, non fossil blk sh
												non calc, non fossil blk sh
	7396											block 7396.25 - 96.5
												shiny circular blob scattered - circled @ 7395.9
												0.5' non calc, non fossil blk sh pyrite blebs oblate 7mm x 1.5mm mica ~ larger
												0.4' to 7397.0 non calc dk qz / blk sh shiny arg? lam, micas
	7397											0.5' to 97.4 non calc dk qz / blk sh plant fossils sticks stems pyritized.
												1-7

TS 7393 concretion, large filled fracture
TS 739.4 dk qz / blk non calc shale

Unit	Depth	Clay	Silt	Sand				Gravel			Symbols	Description
				vf	f	m	c	vc	g	c		
Unit 20 non-calc sh	7398											plant fossil @ 7398 base #3 hint of fabric  fine calc lam 1/4" thick 0.8' depth 7397.9 non calc dk gy/blk shaly on side, shiny sparkly bedding planes, no fossils fract on one side N75E 50SE laminated
	7399											(some suggestion of mottled shale fabric) bedding/shale planes smooth w/  on section marked 7399 base - 1/2 size circular @ 7399.15 calc lam slight fiss objects?
	7400											0.7' (7 sections (B)) v dk gy/blk, non calc shale, no fossils, shiny on? on bedding planes, cellular specks  see pink circles limonitic dots
	7401											0.3 to 7400 (.3 segment) non-calc blk dk gy shale scattered stello @ 7400.1 #3 shiny irregular layers - organic matter? 0.7' v. dk gy/blk non-calc, shale w/ fossil layer - 
	7402											stylon, ten, brach #5 fossil x ↑ 7400.9 smooth fossil depressions? pyrile #4 00.8 @ 7401 (#1) tiny lines crosscutting  tentac, brach, stylon @ base smooth surface
7403												1.1' total segments (6-10) 0.6' v. dk sh calc, fossil frag - exceptionally rare 0.5' v. dk non calc shale, less organic shiny, homogeneous (5 segments)











numbers labeled from bottom to top

3
2
1 ↑

Unit	Depth	Clay	Silt	Sand					Gravel			Symbols	Description	
				vf	f	m	c	vc	g	c	p			b
Unit 19 less organic, shiner	7403													0.35' (5 seq) a top #5 - cephalopod tent, stylio non calc dk qy no fossils base - tentac, large plant frag maybe burrow nubs above, pyrite assoz. In shale frag b/l block - ribbed tentac. Stylio appear #7 of 9
														DKgy non fossil slightly calc.
	7404													shiny black shards, ? fossil possible concretion base - sulcsy, Engelders flower
	7405													0.6' (14 seq \leq 0.05') to 7405.2 seq from bottom slight calc 0.05' #10 meas #9 plant o seq 1-2 slickenside o 7405.2 fossil hash prim stylios slightly CO ₃ where fossils, non-calc otherwise plant o section 2
Unit 18 Calcareous shale attracting w/ non calc blk sh some fossil	7406													0.1' o 7406 slightly CO ₃ blk sh, fossil hash on bedding planes. stylio tentac, brach, trilobite, plant o section 3 of 4 non calc blk shale, stylios on bed. plane
	7407													Calcareous sh 0.1-0.15' thick alt. w/ non calc. blk sh, some fossil; gradual ss fossils reappear o 7407 disseminated pyrite, chalcopyrite large competent segments
	7408													o 7408 calc. dk qy sh, low \angle bedding 80° fractures offset - CO ₃ filled, rt. L into bedding CO ₃ to calcareous sh, larger shells, carbonate strings (masking tape)

Observation: Where shale v. black, no fossils - > salt precipitate
shale black, less organic - shiner

TS 7405 concretion 10, small fossil frag unidentified small fract




Unit	Depth	Clay	Silt	Sand			Gravel			Symbols	Description
				vf	f	m, c	vc	g	c		
Unit 18	7409									γ CO ₃ v. slightly calc @ top 	long stick  3 segments, center smaller other sticks, shells (rare) 0.3' non-calc black sh, no fossil exc @ 7409 - wavy ridges brach 0.2' fissile shale, non calc fossils  X marked 0.7' non-calc. blk sh, no fossils  \approx 1mm
	7410	sh. ro form 7409.8-10							TS 7409.5 #2	Block 7409.22 09.69 but 1' of rock slabbed 7410 written on core Block 7410.09-10.12 7410.1-10.3	TS 7409.5 - 7409.55 (42)
	7411									7411 written on core 7411.3 - 11.55 Block large plant fossils near top \rightarrow	0.2' not so fissile, large plant fossil @ 10.55 non-calc blk shale, rare fossil ~0.5' fissile (~3mm) blk shale, non-calc. one bedding plane.  limpet, staphiloid, tentac. - rare fossils elsewhere
	7412	broken along vert. fract								7412 written on core fossils on bedd. plane fracture dip 83° N	0.2' non-calc. blk sh, isol. rare unid/chiton pyritic (finely dissem) fract continue - discontinuous horiz/vertical 0.2' siliceous, non-calc. blk sh, chiton fossils continue, fract e-w (break) act., enechelon  or  0.4' siliceous, non-calc black shale competent - various enechelon fract trending ~ e-w   hackle marks  chiton? no
	7413								TS 7413 fract fill	7412.4 - 7413.0 7412.8 - 7413.0 concretion block 7413 on core Block 7413.49-13.9	one type fossil - limpet like common. fiss frac. CO ₃ filled discontinuous, core broken along CO ₃ fract. Concretion, fossils scattered, relatively abundant, shells, grey fractures in various orientations all filled large frac filled w/ CO ₃ 18mm fracture fill zoned
	7414									1.3' see next page	

7409.5 non calc blk sh no fossils white
 TS 7413 concretion ls blotch fracture fill brown

Box 82 7415 - 7412

Box 83 7418 - 7415

Box 84

Unit	Depth	Clay	Silt	Sand				Gravel			Symbols	Description
				vf	f	m	c	vc	g	c		
Unit 17 Blk shale, noncalc. fossiliferous	7414											1.3' blk sh homogeneous, non calc. e 7413.95: thin shelled <u>clams</u> only <u>woody</u> <u>brachs</u> <u>sticks</u> *
	7415											↘ Fossil e base w/ finely x-talline precipitate (fibrous) 0.6' non calc non fossil, blk sh
	7416											0.35 continuous blk sh, non calc. fossilif - large brach, tentacs, ostracode on bedding planes scattered fossils reappear e 16.4 Styloloid, tentac. slightly calc lam.
	7417											Black, homog sh, no fossils dull no pyrite
Unit 17	7418											Fract N 32° E no dip To noncalc blk sh - 7418 - 7419 & silica? harder greyer >
	7419											shaly pyrite lenses Gradual e in carb along lam Isolated fossil sticks Fossil lam, calc blk sh fossil lam to bedding / break 15° Fossilif. blk shale, calc  brachs  sticks,  ↘

Box 84 - 7421 - 7418

Box 85 7424 - 7421

Unit	Depth	Clay	Silt	Sand					Gravel				Symbols	Description	
				vf	f	m	c	vc	g	c	p	b			
Unit 16 Blk sh calc	7420													Block 7419.54-19.94	<p>R McDowell Arthropod carapace What are these</p> <p>Blk sh, calcareous, fossilif tentaculites-like</p> <p>0.3' fossil bed ostracods, brachs seen in</p> <p>* Fossil coquina bedding plane - field +</p> <p>Blk shale, mod. calc.</p> <p>Lam of fossils - thin stelled brachs, ?</p> <p>Brach molds 7421.1 bedding plane</p> <p>Slickenside surface ~13° Unit 16</p> <p>Unit 15</p> <p>disseminated pyrite incipient nodule @ 7423 Top of fracture missing Blk sh</p> <p>Cephalopod cast (Chick)</p> <p>Vertical CO3 filled to 23.36 @ 7425 fract intersects core</p>
	7421													Block 7420.7-20.9	<p>TS</p> <p>7420.8 also in bag</p>
														Block 7421.1-21.4	
														Block 7421.4-21.7	
	7422														
	7423														
	7424														

TS 7420.8 blk limy sh - slight calc., CO3 & laminae

Box 86 7427 - 7424

Box 87 7430 - 7427

Box 88

Unit	Depth	Clay	Silt	Sand					Gravel			Symbols	Description	
				vf	f	m	c	vc	g	c	p			b
	7425													<p>Block 7425.1 - 25.25</p> <p>Curved fracture @ 7425.4 → straight 30°</p> <p>Blk sh, homog, non calc.</p> <p>short fracture duc E-W on bed plane</p>
	7426		0.3'											<p>Block 7426.2 - 7426.5</p> <p>Blk shale specks of CO₂</p> <p>Fracture @ angle, CO₂ filled, slicken-sides 7426</p> <p>specks of CO₂ / silt?</p> <p>Blk sh vertical frac CO₂ filled N70E becomes sub-horizontal</p>
	7427													<p>@ 7427 subvertical fract</p> <p>c 27.6 - 27.7 subvertical 1mm</p>
	7428													<p>A to low L parting breaks from ~ horiz 2</p> <p>start</p>
	7429		Continuous											<p>@ 28.7 horiz CO₂ filled fract. no expression on side of core</p> <p>Blk sh, homogeneous, non calc.</p>
	7430													<p>7430 written on core</p> <p>Block 7430.0 - 30.15</p> <p>have this piece (ts) 0.15</p> <p>Blk sh</p>

TS 7430 heavy, dk qy / blk sh

Box 88 7433 - 7430

Box 89 7436 - 7433 ~ 1.5 recovery

Unit	Depth	Clay	Silt	Sand				Gravel				Symbols	Description
				vf	f	m	c	vc	g	c	p		
7431		[X]											Black sh, homog, non-calc.
			Block 7431.12-31.44										
7432		[X]											Black sh, homogeneous, non calc
			Block 7431.44-31.13										
7433		[X]											Blk sh, homog, noncal, pyrite xtals disseminated
			TS 32 3-32.4										
7434		[X]											Blk sh non-calc, homog.
			Block 7433.22-33.55										
7435		[X]											Have this piece
			Block 7434.1-34.2										
7436		[X]											0.25 section concretion large filled fractures white black white CO ₂
			Block 7435.0-35.3										

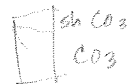
Unit 15

TS 7435
SH
LS



TS 7434 blk / dk qy shale, IV, slightly calcareous

TS 7435 concretion ls, disseminated pyrite → Calc sh



Box 90 1439-1436

Box 91 1442-1439

Unit 15 Homog. blk sh concretions

Unit	Depth	Clay	Silt	Sand					Gravel				Symbols	Description		
				vf	f	m	c	vc	g	c	p	b				
	1436	?												?	0.15 Blk sh, non calc, homog.	
															Block 1436.4-36.62	Black, homog shale
	1437														1437 written on core	
															Block 1437.31-37.68	not smooth cracked horiz H90E BON
	1438														? 1438 written in white	blk? 0.15 dk gy, non calc. sh, fract, harder filled w/ calcite, sh, calcopyrite, various direct N40W, dip 30°
															sections missing top of concretion	0.6' concretion med/H gy micritic?
	1439															Smoother -harder? Homogeneous blk shale, sof M-size sub horiz jagged frac, CO ₃ - filled
	1440														1440 on core	Black sh, non calc. homogeneous slight > in CO ₃ circles 1mm
															Block 1440.15-40.3	
															Block 1440.65-40.8	TS
	1441														Block 1440.8-41.1	1440.7
															Block 1441.1-41.4	NETL?



TS 1440.7 blk sh, CO₃ spots

Box 91

Box 92 7445 - 7442

Box 93 7448 - 7445

Box 93 7448 - 7445





Unit	Depth	Clay	Silt	Sand				Gravel				Symbols	Description	
				vf	f	m	c	vc	g	c	p			b
Unit 15	7442		Continuous										<p>isolated shell molds?</p> <p>Blk sh CO_3 \odot 1mm diam.</p> <p>nothing</p> <p>~ 0.15' CO_3 @ 42.45? - 42.3 apparent</p> <p>top of fract missing @ 42.4 mod. CO_3</p> <p>fract enechelon on top @ 42.6 non CO_3</p> <p>Blk sh ^{near} vertical fracture N90E 85°N carbonate, chalcopryrite filled @ 7442.75 - star - does not bisect entire core  one side top not on opposite side</p> <p>pyrite blebs along bedding plane</p> <p>Blk shale, CO_3 circles 1mm</p> <p>blk sh, within calcite films - localized?</p> <p>non-calc @ 44.2 pyrite xstls on bedding plane disseminated</p> <p>caving here</p> <p>Blk sh, disseminated CO_3, pyrite blebs small CO_3 circles \circ (chalcopryrite?) ~ 0.1mm</p> <p>finer \uparrow chalkier</p> <p>caving 45.5</p> <p>Have twos</p> <p>Blk sh, soft, still ~ coarse - micas disseminated CO_3 - non fossiliferous</p> <p>v. slightly calc - 10% ~ to non calc.</p> <p>med-lower 250-350u - isolated</p> <p>Blk sh - continuous \downarrow</p>	
													<p>7442 written on core</p> <p>$\frac{1}{2}$ - T</p> <p></p> <p>7442.6 on label</p>	
		7443												<p>Block 7443.12 - 43.57</p>
		7444												<p>7444 - written in white on core</p> <p>sections 0.1' thick do not fit</p> <p>caving here</p>
		7445		does not fit 0.5' to 4.0'										<p>7445 written on core</p>
		7446		Continuous 0.6'										<p>TS</p> <p>7445.8</p> <p>* Block 7446.1 - 46.6</p> <p>Block 7446.6 - 46.85</p>

TS 7445.8 Blk sh, homog. slight calcareous

Box 93 7448 - 7445

Box 94 7451 - 7448

Box 95 7454 - 7451

Unit	Depth	Clay	Silt	Sand				Gravel				Symbols	Description
				vf	f	m	c	vc	g	c	p		
	7447												Blk sh, coarse micas, soft, no silt qtz 1.0' to 7446.85 - 7448.
	7448												section missing 7448 on core Blk sh, non cal, softer
													Blk sh small vertical + horiz calcite filled fract mm size
	7449			0.25									Black 7448.95 - 49.1 cored vertically  blk sh - gy shale harder - exterior smooth slabbed sections - horiz 0.15' dolomitic?
				0.15									
				0.4'									← in wrong place
	7450												Block 7449.75 - 49.85 Block 7450 M. Evans fract continues 0.1' + 0.4' of core NETL paper top missing
													Interval 0.4' core blk sh, homog. no fossils subvertical fract N78E 75' begins   
	7451												Black sh, non calc, homog. P.H.
													Block 7450.8 - 50.95 Block 7451.1 - 51.3 Block 7451.3 - 51.8
	7452												7451.8 pyrite nodules, oxidized to sulfur, ? salt Blk sh, homogeneous, non-calc no fossils

Unit 15

Box 95 7454 - 7451

Box 96 7457 - 7454

Unit	Depth	Clay	Silt	Sand				Gravel				Symbols	Description
				vf	f	m	c	vc	g	c	p		
													52.5 oxidized pyrite zone 0.05' thick @ 52.7
	7453		Sulfur										7453 written on core Non calcareous homog. black shale blocky
													Block IGT 7453.4 - 53.6
													colorful metal sub-vertical fract - CO ₂ filled 0.01m N50E 80°SW
	7454												fracture section missing - start of fracture check NETL - paper Block 7454 - 54.2 I BT blocky 0.15' blk shale no fossils non-calc - v. slightly CO ₂ pyrite crystals on bedding plane 74.3
													styrofoam marking TB 5455.8 - 55 v. slightly calcareous, no fossils blk sh
	7455												7455 on core Block 7455.15 - 56.3 TB Have this - TB
													7455.2 I slightly calcareous, no fossils
													slightly calcareous > ↑ to blk sh non-calc, fossil lower bedding plane - decrease to rare ↑
	7456												7456 on core Block 7456.05 - 56.4 Block 7456.A - 56.6 x in fossils on bedding plane no brachs, slightly calcareous caving 57.0
													I isolated fossils - tentaculites c 7457'
	7457												T slightly calcareous caving 57.6
Unit 15													Block IGT 7457.7 - 57.9

TB 7455.2 blk sh, non calc fossils
precipitate bridges frac lam

Box 97 7460 - 7457




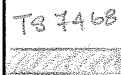
Box 98 7463 - 7460 1.5' recovered out of order

Unit	Depth	Clay	Silt	Sand				Gravel				Symbols	Description
				vf	f	m	c	vc	g	c	p		
Unit 15	7458												non-cal. blk sh, homogeneous 7458 on core isolated tiny fossil frag isolated conc of pyrite/sh causing sb. b/spalling
	7459												@ 59.15 ripple lam blk sh 0.15' v. dk gy. calc sh - gradual ↓ in CO ₃ ↑ to non-calc blk sh low L, vertical conjugate CO ₃ filled 40/110° straight to irregular scattered fossils on side of core
	7460												Box out of order considerable spalling b/l ls ~ 0.4 shaley ls, no fossils dk gy (concretion), squiggly vertical fractures, on bedding plane CO ₃
Unit 15	7461												Block 7461.1 - 61.5 Block 7461.5 - 61.75
	7462												7462 on core Non calcareous blk shale @ 7462, tiny fossils - v. rare ↳ pyrite
Unit 14	7463												non cal non-fossil blk sh ↳ fossil v. slightly calcareous ↳ disseminated pyrite

TS Sample 7459.6 concretion / fossiliferous fracture M size
7462.0

Box 99 7466-7463

Box 106 7469-7466

Unit	Depth	Clay	Silt	Sand				Gravel				Symbols	Description	
				vf	f	m	c	vc	g	c	p			b
Unit 14	7464													<p>- above fossil bed > disseminated pyrite < fossils < CO₂ 0.1' styliolimid-tentat - brach concentrated</p> <p>fossils on bedding planes brachs,  styliolimids</p> <p>< fossils, traces slightly - moderately calc.</p>
Unit 14	7465													<p>TS  7465.1</p> <p>Have this</p> <p>Block 7465.0 - 65.2</p> <p>Block 7465.4 - 65.7</p> <p>4mm foss bed</p> <p>Dull, thinly lam/platy 0.2' slabbed slightly - mod calc. scattered fossil</p> <p>Black sh, few fossils  moderately calcareous on bedding planes</p> <p>Unit 14 gradational contact ubiquitous</p>
Unit 14	7466													<p>Block 7466.15 - 66.4</p> <p>slabbed</p> <p>4mm</p> <p>Fossil sh ls interbedded w/ blk slightly CO₂ sh - ls > top</p> <p>0.5 v. fossilif. shaley ls, burrowed biot-concentrates sh,</p> <p>transition gradational to</p> <p>0.05' & fossils, > blk shale</p> <p>0.1 fossil sh</p>
Unit 13	7467													<p>~ massive lam?</p> <p>II =</p> <p>IIA</p> <p>0.6' blk/v.dk qy? slightly CO₂ shale chalky, dull</p> <p>irregular ~ contact w/ ↑</p> <p>0.2' fossil blk sh, shells flat lying horiz to Unit 13 bedding ~ bed e 7469.7</p>
Unit 13	7468													<p>Black shale, mod. calc, fossilif - brachs, in places concentrated to form lam</p> <p>Suggestion of horiz lam - Fe? rich > fossil</p> <p>Unit 12</p>
Unit 12	7468													<p>TS 7468.8</p> <p> 7468.8 - 68.9</p> <p>pyrite noticeably lacking Unit 12, 13</p> <p>CO₂ filled mold, 0.1" fossils - concentrated boundary ~ sharp</p>

7465.1
 TS 7468.8 Blk fossil lam sh - calc.

Box 101 7472 - 7469

Box 102 7475 - 7472

Unit	Depth	Clay	Silt	Sand				Gravel			Symbols	Description		
				vf	f	m	c	vc	g	c			p	b
Unit 12 blk shale segments 0.2 - 0.01'	7469	fossil sh	m									brach molds bed plane 69.115 ↑ > CO ₂ fossils	1.0' black sh segment 0.1-0.2' V. slightly calcareous - crystals at base some suggestion of lam - Fe-rich layers in bioac - surface isolated shells 0.15' laminated fossil hash, wavy to mod calc, fossils	
	7470	sh										Block 7470 - 70.05 1/2 of Cinn	0.2' black sh, soft, dull, slightly calcareous	
													Block 7470.4 - 70.6	0.2' black shale, poker chip, fissile - caving, slightly calcareous
													Block 7470.7 - 7471.0	
	7471												Blocks (2)	0.07' 0.12 black sh, laminated horiz, very calcareous, CO ₂ vials form lam, small circular fossils @ top pyrite blebs, irreg. nodules very thin CO ₂ layers (common in core) on bedding plane, 1/4" thick
													7472 marked on core	
													7471.2 - 71.6 7471.5 - 71.9	0.3' blk sh, homogeneous, poker chips, slightly calc.
													Block 7473 - 7473.5108 Wrong depths	bedding planes + dull, shiny,
	7473	veins												1.9' poker chip, blk shale V. slightly calcareous - variation - barely to somewhat chips < 1mm - 0.1' fairly soft - dull few shiny bedding planes
		v. flaggy caving 73.6, 74.2												e 7473.1 numerous calcite filled fractures, vertical, small enechelon tails, others offset, bent samples by M Evans - fluid inclusions
	7474												7474 written on core	

This section is continuous

caving

asphaltoid calc - lower 1/3 (cl. 66)



Low GR. 7474 7469. 7474 -> probably reflect 66 - 72

Box 102

Box 103 7478 - 7475 heavy box

7481 - 7478

Unit	Depth	Clay	Silt	Sand				Gravel			Symbols	Description
				vf	f	m	c	vc	g	c		
Unit 12	7475											frable/caving @ 0.5' black, slightly calc. shale, pyrite blebs
			1.3'									0.15 dk gy calc. sh' (diffuse) 0.15' black flaggy big shale (contacts) 0.5' dk gy calc sh
Unit 11	7476											Dk grey sh, small broken flaggy chips - bag
Unit 10	7477		x x									sudsy? <u>nodule</u> M small fossils darker burrow blebs gradual no bedding > CO ₂ to gy calcareous shale above vertical fracture shaly ls
	7478											small vertical fract. filled w/ CO ₂ ; vertical length 5mm calcite vein, horizontal < 1mm in v. blk sh black shale along bedding plane
	7479											Black shale, hard, blocky Section b/t 0.05 - 0.2' thick Pyrite blebs slightly calcareous Pyrite along bedding plane

competent



Box 104

Box 105 7484 - 7481 1.7' recovered

n. 2' recovered blocks shale

Unit	Depth	Clay	Silt	Sand				Gravel				Symbols	Description
				vf	f	m	c	vc	g	c	p		
7480													organic, no fizz
7481													Black sh, dull
7482													Black sh Small <1mm vertical calcite vein 0.15' in length @ moderately soft abundant disseminated pyrite < CO ₂
7483													
7484													vertical fracture TS fissile, organic (soft) Calcareous shale w/ isolated CO ₂ (fossil?) interesting CO ₂ lam. hump sharp contact - uppermost lam CO ₂ 0.4' shaley ls, low L med L lam of CO ₂ shell hash
7485													Unit 9
													Unit 8

TS 7481.8 calc blk sh fossils
 TS 7485 laminated fossiliferous ls - fossils are lam.

Box 106 7487-7484

recovery 2'

Box 107 7490-7487

Unit B Black shale thick poker chips

Unit	Depth	Clay	Silt	Sand				Gravel				Symbols	Description
				vf	f	m	c	vc	g	c	p		
				strat from 7585.5-85.7									0.95 Blk sh 0.2' cylinder 7486 written @ 0.7 c top poker chip - from top in poker chips 7485.55 O D discs on bedding plane
	7486			7486.10-7486.63 (in bag)									0.1 Blk sh 0.17 Blk sh slabbed - organic 0.25 Blk sh
	7487			16T 7486.9-87.2 12-6-83									Black shale, broken in poker chips 0.02 to cylinders 0.8'
	7488		IT	- 7488 marked on core									White CO ₂ micro thick, sub-horiz/horiz ? fracture fills - producing irregular features on breakage planes
	7489	CONTINUOUS ~1.5'		- 7489 marked on core ICT block 7489.0-7489.2									disseminated pyrite, CO ₂ CO ₂ concentrated in lam > CO ₂ to
	7490			out of sequence? 7490 written on core									slabbed 0.25' check for TS
	7491			rubble in sample bag 16T 12-6-83 7491.2-7491.46									Black sh, poker chips 0.01-0.1' thick micro-size fractures - CO ₂ filled horiz CO ₂ discontinuous lam (vertical disseminated CO ₂ /pyrite ~horiz hematite; CO ₂ concentrated in lam pyrite lam, zones
	7491			Klenderman WV65 7490.8-7491.									pyrite

Irregular CO₂ assoc. w/ shear slickensided planes
~ b/t micro size shear planes

TS 7487 lt. gy fossil ls - prob concretions

Box 108 7493 - 7498 ~ 2' core recovered

Box 109 ~ 2.3' core was upside down



















7496 - 7499

Unit	Depth	Clay	Silt	Sand				Gravel			Symbols	Description
				vf	f	m	c	vc	g	c		
	7491											
												7491.2 - 7491.4 KPM WVGs 7491.4 - 7491.72 M
Unit 7	7492											slickensides @ 7491.9
												suggestion of low L laminae
												* TS 7392.5
Unit 8	7493											0.1' Blk shale, dull > poker chip breakage toward top (< CO ₃) poker chips 0.01 - 0.1' thick
												Unit 8
												Unit 7
	7494											~0.3' calcareous shale ~horiz to low L lam of CO ₃ shell hash, alternating light shell lam w/ darker shalier lam dip to NE
												0.45' shaly ls, horiz beds, lighter beds > CO ₃ shell - irregular ? burrowed base gradual Δ to > shale, ...
												0.7' blk shale, poker chip, dull slickensided surfaces
	7495											poker chip contact gradual
Unit 7	7496											0.85' Gray shaly ls - shaly not fissile in center low L lam, fossils comprise lam; burrowed tiny ~ vertic filled fract
												Core marked 7496 Block 7496.08 - 7496.47
												7495.81 - 95.9 Klanderinan
												Block 7496.3 - 7496.5
	7495											Gray shaly ls - gradually shalier toward top Fracture N10°E dip 80° ~ 75° 2 fract N75 W dip ~ vertical Blk sh, poker chips

Black shale thick poker chips in bag marked 7496

Base
Marcellus
Box 110 7499-7496

Box 111 7502-7499

Unit	Depth	Clay	Silt	Sand				Gravel				Symbols	Description
				vf	f	m	c	vc	g	c	p		
Unit 6 7499-7496.3	7497											 	Black, calcareous sh w/ beds of shaly ls 0.1-0.2' thick poker chips 0.13 @ 7499 0.42 @ 7495.9-7496.3 Fracture @ ~ 97 N70E vertical CO ₂ filled Pyrite filled fractures ~97.5 laminated, lighter CO ₂ low L slickensides N70°E common
	7490												
Unit 5 7501-7502	7499											              	0.13' shaly ls, limy sh grey fossil lam @ top - better base 0.45' Blk sh, poker chips, low L lam Pyrite filled fractures, pyrite lam sharp contact w/ underlying sh ls. Gray shaly ls, low L horiz lam at black shale, fossils @ base w blk calc. sh transition sh ls → limy sh abrupt, not scour > density of lam at contacts mm size vertical fractures CO ₂ filled irregular L 
	7501												
	7502												0.1

Core marked 7497 pyrite
fract

Univ. of
Klamath
WVGES

(3)

slsd - slickensides

Box 112 7505 - 7502

Box 113 7508 - 7505

Unit	Depth	Clay	Silt	Sand				Gravel				Symbols	Description
				vf	f	m	c	vc	g	c	p		
Unit 5 alternating ls / dk shly ls - limey sh 7507.0 - 7499.5'	7502			missing									0.45' altern lt/dk lam fossil ls, dk calc sh
													light lam - fossil hash
													0.05' hor lam foss calc ls/sh
	7503												0.15' dk horiz lam calc sh
													1.0' alternating lt/dk lam, ls, calc sh
													wavy crinkly lam of fossil hash and calcareous shale
													soft sed deformation
	7504												0.1' dk qy/blk shale
													0.4' alt qy ls, dker sh ls, limey sh laminated, low L ripple, lam shell hash
													0.3' dk qy chalky ls, shaley bedding planes, peker chips, white CO ₂ low L lam
												2 vertical w fracture - CO ₂ colorful Fe filling	
7505												0.4' dk qy chalky ls, shaley ls broken 0.05-0.1', low L bedding planes sh on bedding planes	
												0.5' competent ls, qy, burrowed horiz - low L lam	
												dk-grey, sharp irregular contact @ base, > sh?	
7506												Have this better sample b/l	
												0.3' alternating, > ls, low-hi L bedding shaley bedding planes - sharp contacts	
												0.4' ls, low L, ripple laminated competent	
7507												0.25' dk qy ls - shaley finely lam CO ₂	
												w fracture feathers out into dk ls	
												lighter lam - small calc fossils coquina vertical fract - CO ₂ filled	

dk bed/lam - shaley light lam - fossil hash appears low diversity arrays of vertical w size fractures, CO₂ filled

TS 7505 lam fossilif ls

Box 113

Box 114 7511 - 7508

Box 115 7514 - 7511

Unit	Depth	Clay	Silt	Sand				Gravel				Symbols	Description
				vf	f	m	c	vc	g	c	p		
Unit 5	7508												0.1' blk/gy ls + shaly?
Unit 5	7508.7 - 7499.5												0.55' ls fossil, low L lam, wavy crinkly wavy lam base coquina of small thin walled shells
Unit 4	7509		Bentonite										Unit 4 - gry shale, calcareous BENTONITE - localized areas @ 7508.8' contact - introduction of wavy laminae > to sharp shale 1.6' ls, fossils, burrows
Unit 3	7510												discontinuous, wispy lam
Unit 3	7511	missing											7510 on core
Unit 2	7512												Block 7508.5 - 08.7
Unit 1	7513												Block 7511.15 - 11.4
													laminated slightly calcareous
													darker, gy, smaller nod sharp contact large nodular chert some sh? bt nodules

Box 115

Box 116 7516-7514

Box 117 7517.8-7516

Box 114

Unit

Depth

Clay

Silt

Sand
vf f m c vc g

Gravel
c p b

Symbols

Description

7514

7515

7516

7517

167.7 cm



Block 7517.6-7518
P#

Huntersville Chert - beige to lt. gray
nodular, v. slightly calcareous
in places