

			THIN SECTIONS	STAIN, ETC.	POL. SECT.	SPECIAL	MICROSCOPIC ANALYSIS	PHOTO.	INSTR. ANALYS.	
SAMPLE NO.			STANDARD THIN SECTION PRECUT TO SIZE NO COVERGLASS 1 x 3" THIN SECTION 1 1/2 x 3" THIN SECTION 2 x 3" THIN SECTION K-FELDSPAR STAIN CALCITE STAIN BLUE-DYED STAIN POLISHED EPOXY IMPREG. POL. THIN SECTION POL. THIN SECT. (27x46mm) GRAIN MOUNT SLAB ONLY (1 1/4" RD) I ARROW SLAB IMPREG ORIENTATION GRINDING IN OIL PETROGRAPHIC DESCRIPTION ALTERATION DESCRIPTION POL. SECT. DESCRIPTION MAJOR MINERALS DETERM POINT COUNT MINOR MINERALS DETERM'D MICROGRAPHS (COLOR) X-RAY DIFFRACTION DEBYE-SCHERRER							SPECIAL INSTRUCTION
1	827	✓	✓							
2	830	✓	✓							
3	836	✓	✓							
4	840	✓	✓							
5	849	✓	✓							
6	864	✓	✓							
7	908	✓	✓							
8	921	✓	✓							
9	944	✓	✓							
10	948	✓	✓							take care - broken
11	961	✓	✓							
12	976	✓	✓							
13	982	✓	✓							
14	983	✓	✓							take care - coal lam
15	999	✓	✓							
16	1004	✓	✓							
17	1014	✓	✓							
18	1015	✓	✓							
19	1019	✓	✓							
20	> 1064	✓	✓							Shale take care - broken, g
21	1087	✓	✓							
22	1101	✓	✓							
23	1116	✓	✓							take care - broken, g
24	1129	✓	✓							
25	1138	✓	✓							
26	1145	✓	✓							
27	1150	✓	✓							
28	1156	✓	✓							
29	1160	✓	✓							
30	1169	✓	✓							
31	1173	✓	✓							take care - coal lam
32	1179	✓	✓							
33	1023	✓	✓							take care - shaly
34	1024	✓	✓							" " "
35	1027	✓	✓							" " "

COLT 18-AO KEOWN

NENW SW 22-23S-18E

ALLEN CO., KS

820

830

840

850

860

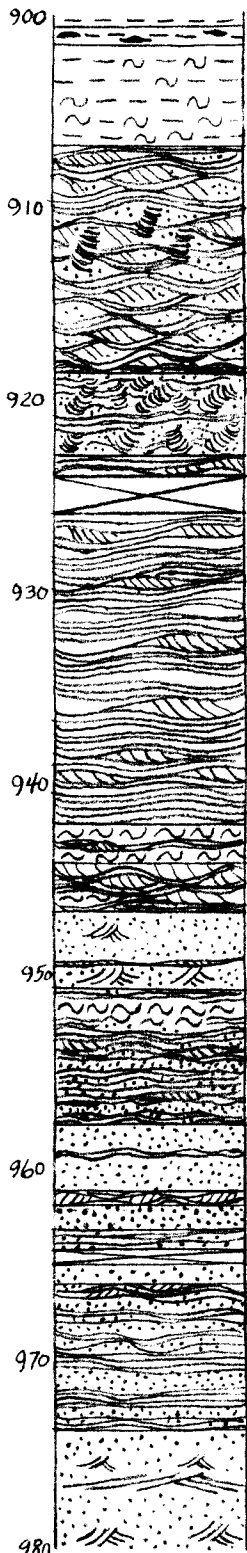
870

880

890

900

- LIMESTONE: LT GY - DK GY, BURROW MOTTLLED, MUDSTONE W/ A FEW BIOCLAST
MACROSCOPIC BIOCLASTS INCLUDE ECHINODERMS, SLIGHTLY ARGILL. OR CHALKY
- SHALE, LT GY, V. SLIGHTLY SILTY: DK DISCONTINUOUS LAMINAE; LT GY PEBBLES OR CONCRET
- SHALE, BLK, FINELY LAMINATED, LT GY CONCRETION OR PEBBLES, NONCAL.
- LMS. BLK MUDSTONE, FEW MACROBIOCLAST IN BOTTOM 3"; 2" BLK LAMINATED SHALE AT 30" NONCAL.
- COAL, BLK
- SHALE, LT GRAY - GR. SLIGHTLY SILTY, SOFT, NO OBVIOUS LAMINATION, NONCAL, MED. BLOCKY
- SHALEY SILTST - BR + GREEN, FINELY LAMINATED; SLIGHT BR - GR BANDING; LIMY CONCRET. TOP 6"
- V. FINE SS (OR A SILTSTONE); LT. BROWN, DUE TO OIL STAIN(?), VERY WELL SORTED W/ A FEW
- 1/4" to 1/8" GREEN ARGILL. BANDS; NONCALCAR., VERY WELL CEMENTED; FAINT RIPPLE LAMINATION
- SAME AS ABOVE BUT GREEN WAVY BANDS ARE MORE COMMON + COMPOSED ~ 2/3 OF ROCK
- V. FINE SS (OR SILTY SS); BROWN, DUE TO OIL STAIN; VERY WELL CEMENTED; WELL SORTED; RARE
- GR. BAND; FAINT TO MOD. DISPLAYED RIPPLE LAMINATION; NONCAL. EXCEPT 40 8" to 40 10"
- V. FINE SS OR SILTY SS. BROWN (OIL STAINED); ~ 2/3 RX IS THIN GREEN ARGILL. BANDS AS ABOVE
- V. FINENESS OR SILTY SS. GRAY - GREEN OR BROWNISH; WELL CEMENTED; NONCALCAR., FAINT LAMINATION
- V. FINE SS OR SILTY SS.; GRAY, GRAY BROWN OR BROWN, WELL SORTED; WELL CEMENTED, LOCALLY SLIGHTLY CALCAR
- LAMINATION IS IRREGULAR + OFTEN APPEARS DISRUPTED + DEFORMED; SOME MINUTE BLK FLAKES.
- SILTSTONE; BLK + GRAY STRIPPED; FINELY LAMINATED SILTSTONE, BLK LAM. MAY BE FINER
- THAN SILT SIZE; NONCALCAREOUS, WELL INDURATED BLOCKY, HARD, COMMON PYRITE CYRSTALS
- VARVED APPEARANCE, GRAY SILT LAYERS CONTAIN FINE CARBONACEOUS MATERIAL
- SILTSTONE: BLK + GRAY STRIPPED VARVED APPEARANCE. GRAY LAYERS HAVE FINE DISSEMINATED
- CARBONACEOUS MATERIAL + BLK LAYER HAVE A GREATER AMOUNT; ESSENTIALLY
- SAME AS ABOVE BUT PYRITE IS ABSENT - RARE LT. SILTY LENSE - ISOLATED RIPPLE(?)
- SILTY CLAYSTONE OR CLAYEY SILTST, DK GRAY MOTTLLED TO FAINT LAMIN. BUT NOT VARVED, WELL INDURATED NONCAL
- SILTSTONE MAY BE CLAYEY, STRIPPED BLK - GRAY VARVED APPEARANCE; LIKE STRIPRX ABOVE, NO PYR.
- SILTY SHALE OR VERY CLAYEY SILTSTONE; DARK GRAY; THE RX MAY BE FINELY LAMINATED BUT LAMINAE
- ARE USUALLY GENTLY WAVY, DEFORMED OR DISRUPTED, GRADING INTO A
- MOTTLLED APPEARANCE. SEE SOME PAPER THIN CARBONACEOUS FLAKES; NONCALCAR.; WELL
- INDURATED, HARD, BLOCKY
- SHALE; GRAY; RELATIVELY SOFT; NONCALCAREOUS; BROKEN INTO 1" THICK CHIPS GENERALLY
- SILTY-CLAYEY LMS.; GRAY; IRREG. TEXT. + DISRUPTED LAMINAE, BURROWED; MUDST TO BIOCLAST. WHYSTONE
- CALCAREOUS CLAYEY SILTST; BURROW MOTTLLED LT GY - DK GY.; BIOCLASTS LOCALLY. BIOTURBAT. SILT LENSE
- CLAYEY SILTST; MOTTLLED WHITE/ LT GY - DK GY COLOR; IRREG. DK GY/BLK SHALE LAYERS - DISRUPTED
- IN LT. COLOR SILT BURROWED OR SOFT SED. DEFORM. NONCALCAR.
- CLAYEY SILTSTONE OR SILTY SHALE; DK GY; NONCAL., WELL INDURAT. HARD, VERY FAINT LT. COLOR WISPY LAMIN.
- SILTY SHALE; DK GY WITH WHITE/ LT GRAY IRREGULAR SILT LENSES + BANDS IN THE DK FINER
- MATERIAL - SILTY LENSES + LAMINAE DEFORM + DISRUPT - BURROWING OR SOFT SED DEFORM;
- NONCALCAR.; FAIRLY HARD; BROKEN INTO 1" TO 2" CHIPS
- SLIGHTLY SILTY SHALE; DK GRAY; SMALL WH TO LT GRAY SILT LENSES ARE SEEN BUT ARE RATHER
- UNCOMMON; FAINT HINT OF PARALLEL LAMINATION OR SORT OF A WISPY LAMINATION, NONCALCAR.
- SHALE; DK GRAY; SLIGHTLY SILTY; SHALE MAY SHOW PARALLEL LAMINATION, SOMETIMES WITH
- FINE LT. GY/ WHITE SILT LAMINAE OR IT MAY SHOW A FAINT PARALLEL DK LAMINAE
- OR A WISPY LAMINAE OR IN OTHER CASES LAMINAE MAY APPEAR ABSENT
- THE SHALE IN NONCALCAR. AND IN CHIPS 1/2" TO 1" THICK EXCEPT 876 - 877 WHERE CHIPS
- ARE ABOUT 1" TO 2" WIDE
- LMS; BLK, MASSIVE MUDSTONE - NO BIOCLASTS
- SHALE; DK GRAY; MAY DISPLAY VERY FAINT LAMINAE OR A WISPY LAMINAE BUT
- MORE COMMONLY LAMINATION DOES NOT APPEAR TO BE VISIBLE. BREAKS INTO
- 1/2" THICK CHIPS - SPLINTERY - FISSILE. NONCALCAR. EXCEPT 888' TO 888' 9"
- IS V. SLIGHTLY CALCAREOUS.
- VERY CALCAREOUS SHALE (BORDER LINE VERY ARGILL. LMS) DK GY/BLK.; BIOCLASTS ARE COMMON + SCATTERED
- THROUGHOUT BUT LOCALLY MAY BE SCARCE; IN CHIPS USUALLY ABOUT 1" THICK BUT BREAKS INTO
- THINNER CHIPS; OCCASIONAL ELLIPTICAL LIME CONCRET.; OCCASS. BROWNISH STREAKS - LIMONITE? NO OBVIOUS LAM.
- CALCAREOUS SHALE; BLACK; V. FISSILE FLAYEY SHALE; CARBONACEOUS ALMOST GOAL; FEW BIOCLASTS
- CALCAREOUS SHALE; DK GY/BLK.; SOMEWHAT FISSILE; SLIGHTLY CARBON. ABUNDANT BIOCLASTS
- SHALE; DK GRAY; IN CHIPS 1" TO 1/2" THICK; FISSILE; SOME PIECES SHOW A FINE LAMINAT. WHILE OTHER DON'T; NONCAL
- SHALE; DK GRAY; FINELY LAMINATED GIVING A VARVED APPEARANCE; NONCAL; IN 1" TO 1/2" THICK CHIPS; PYRITE @ 94"
- SHALE; DK GRAY; SHOWS FAINT PARALLEL LAMINATION; IN CHIPS 1/2" TO 1"; SOMEWHAT FISSILE; NONCAL EXCEPT BOTTOM
- 2" WHICH IS CAL. + HAS A FEW SCATTERED BIOCLASTS
- SHALE; DK GRAY; FINELY LAMINATED; NONCALCAR.; HAS SOME FAINT BROWNISH LENSES THAT MAY BE LIMONITE
- SHALE; DK GRAY; FINELY LAMINATED; NONCALCAR.; 1" TO 1/2" CHIPS; IN A FEW THICK LAMIN SEC MINUTE DM HAIR-LIKE TEXT.
- SHALE, GRAY TO BROWN, RARE LAM. OR COLOR BANDS



SHALE, GY-BRN WITH MANY SMALL INTRACLASTS (DEFORMED) POORLY BEDDED. SHALE, SOMEWHAT SILTY; LT GY/GY - BROWN; LACKING LAMINATION; CONTAINS HAIR LIKE TEXTURE LIKE ABOVE, DK LENSE LIKE FLAKES. HAIR LIKE FEATURE BUT LARGER, MAY BE SEVERAL MM LONG (RIP-UP CLASTS) NONCALCAR.

* 2" OF DK GY LAMIN SH. WITH THIN WHITE SILT LAM 906'10" TO 907'

SILTY SHALE; LT GY/GY - BROWN; GENERALLY LACKING LAMINATION BUT MAY BE SOME FAINT LAM. SOME DISRUPTED LAM. GENERALLY GET MINUTE HAIR LIKE TEXTURE AS DESCRIBED ABOVE. GET SOME LARGER FLAT DARK LENSE LIKE CLAST FROM 903'6" TO 904'. THESE LARGE (SEVERAL MM LONG) LENSE LIKE FEATURE & WHAT LOOK LIKE DISRUPTED LAMINAE ARE SEEN TO A LESSEK EXTENT FROM 904' TO 906'. INCREASINGLY BROWN 906' TO 906'10". NONCALCAR.

FINE SANDSTONE; LT GRAY SAND WITH IRREGULAR VERY THIN DK GRAY CLAY LAMINAE - IRREGULAR BENDING OF LAMINAE DO IN LARGE PART TO DRAPPING OVER SMALL FINE SAND LENSES; THE FINE SAND LENSES ARE RIPPLED X-BEDDED. FLASER BEDDED. IRREGULAR CLAY DRAPES DISRUPTED BY SOME SOFT SED. DEFORMATION, COMPACTION, AND BURROWING. BURROWS 1/4" TO 1/2" WIDE AT A HIGH ANGLE TO BEDDING & SHOWING AN INTERNAL STRUCTURE OF CONCAVE UPWARD LAMINAE ARE SCATTERED THROUGHOUT BUT ARE MINOR EXCEPT IN THE INTERVALS 911'6" TO 912' AND 913'3" TO 915'4" WHERE THEY ARE VERY COMMON. NONCALCAR. OTHER TYPE BURROWING ALSO SEEN. 918'4" TO 918'8" CLAY LAMINAE COMPOSE MOST RX & SS LENSE ARE & SMALL

FINE SANDST. LIGHT GY SAND & FINELY LAMINATED WITH DK GY CLAY; LAMINAE ARE USUALLY NOT HOWEVER PRESERVED DUE TO STRONG BIOTURBATION - BURROWS 1/4" TO 3/4" WIDE AT A HIGH ANGLE TO BEDDING BACKFILLED WITH CONCAVE UPWARD LAMINAE. A FEW SCATTERED SIDERITIC BANDS ARE PRESENT MINUTE CARBONACEOUS MATERIAL IN SAND. NONCALCAR.; 2 1/2" FINE SAND BED, NOT LAMINAR, CARBON. MATER. AT 921'

FINE SANDSTONE; LT. GRAY SAND AND DK GY CLAY TWO BASIC TYPES OF LAMINATION ARE SEEN HERE (1) A VERY FINELY LAMINATED FINE SAND AND CLAY WHERE LAMINATION IS VERY EVEN AND REGULAR (2) A FLASER TYPE TEXTURE WHERE SAND OCCURS IN SMALL LENTICULAR LIKE BODIES AND CLAY DRAPES OVER THE LENSES. THE BURROWS SEEN JUST ABOVE ARE RARE FROM 923' TO 929'. A ESSENTIALLY ABSENT IN THE REST OF THIS SECTION. AT 932'8" AND 940' ARE 4" FINE TO MED FINE LT GY SANDSTONE BEDS LACKING THE CLAY LAMINAE. THESE BEDS CONTAIN CARBON. FLAKES & STRINGER. THE FIRST ALSO CONTAINS SOME SIDERITE BANDS AND THE SECOND SOME SMALL METALLIC CONCRETIONS. THE SECOND BED IS OIL STAINED & BROWN IN COLOR. NONCALCAR.

(SCATTERED CARBONACEOUS SPECKS. NONCALCAR.) SILTSTONE BEDS ARE USUALLY 2" THICK.

- SILTSTONE & FINE SS.; 2 ALTERNATING RX TYPES ARE SEEN. (1) A DK GY/GY VERY FAINTLY LAMINATED SILTSTONE (2) A LAMINATED LT. GY. FINE SS. & DK GY CLAY WHICH MAY SHOW FLASER BEDDING. THE SILTST. & SS BOTH CONTAIN FINE SANDSTONE LENSES OR BANDS OF FINE TO MED. FINE LT. GY SS. OFTEN RIPPLED X-STRAT. ALTERNATE W/ VERY FINELY LAMINATED DK SILTY CLAY & FINE SS. AS WELL AS SOME THIN (1/4" - 1/2") DK GY SANDSTONE BANDS. CARBONACEOUS SPECKS OCCUR IN THE SS & SILTST. NONCALCAR. (FLASER?)

- SANDSTONE; DK BROWN, OIL SATURATED, BLEEDING OIL; INTERNAL STRUCTURE IS DIFFICULT TO SEE DUE TO OIL BUT SOME DUNE SCALE X-STRAT. IS SEEN AS WELL AS A LITTLE RIPPLE SCALE X-STRAT. SAND IS FINE TO MED.; AT 948'10" TO 949'4" 950'12" TO 950'4" ARE UNSTAINED FINELY LAMINATED DK SILTY SHALE & LT GY FINE SAND. THEY MAY SHOW FLASER BEDDING & THE SAND IS RIPPLE X-STRAT. NONCALCAR.

- FINE SANDSTONE; LT GY FINE SAND & DK GY SILTY CLAY; LAMINATIONS ARE GENERALLY REGULAR AND EVEN WITH ONLY MINOR FLASER BEDDING. VERY SMALL BULBOUS LOAD STRUCTURE ARE SEEN ON THE BOTTOM OF SOME OF THE V. THIN SS. LAMINAE 51'6" TO 52'10" IS PREDOMINATELY A FINELY LAMINATED DK GY SILTSTONE SHOWING SOME SOFT SEDIMENT DEFORMATION. AT 954'7" (2"), AND 957'2" (3") ARE MED GRAIN TAN SS. W/ MODERATE OIL STAINING. AT 956'4" IS A DK BROWN 2" BED OF OIL STAINED SS. AT 955'7" IS A 1 1/2" BED OF MED FINE SAND, OIL STAINED SLIGHTLY & HAS SHALE RIP UPS. NONCALCAR.

- SANDSTONE; DK BROWN AND LT. BROWNISH-GRAY; FINE TO MED. GRAIN; SAND FROM 957'11" TO 960'3" IS STRONGLY STAINED, FROM 960'3" TO 961'3" IT IS MOD. OIL STAINED. SMALL CARBONACEOUS MATER. IN SAND. & ALSO SOME FAINT WISPY LAMINAE. 958'4" (3") & 959' (8") ARE FINELY LAMIN. DK GY SILTS, & SS

- SANDSTONE; LT. GY FINE SS & DK GY SILTY CLAY. FLASER BEDDED WITH SOME RIPPLE X-STRAT IN LENSES. NONCALCAR.

- SANDSTONE; BROWN; MODERATELY STRONG OIL STAIN; FINE TO MED GRAIN; CARBON. MAT. SHALE TIP UPS 963; NO LAMIN?

- SANDSTONE & SILTY CLAY; FINELY LAMINATED DK GY SILT CLAY AND GRAY. BROWN SLIGHTLY

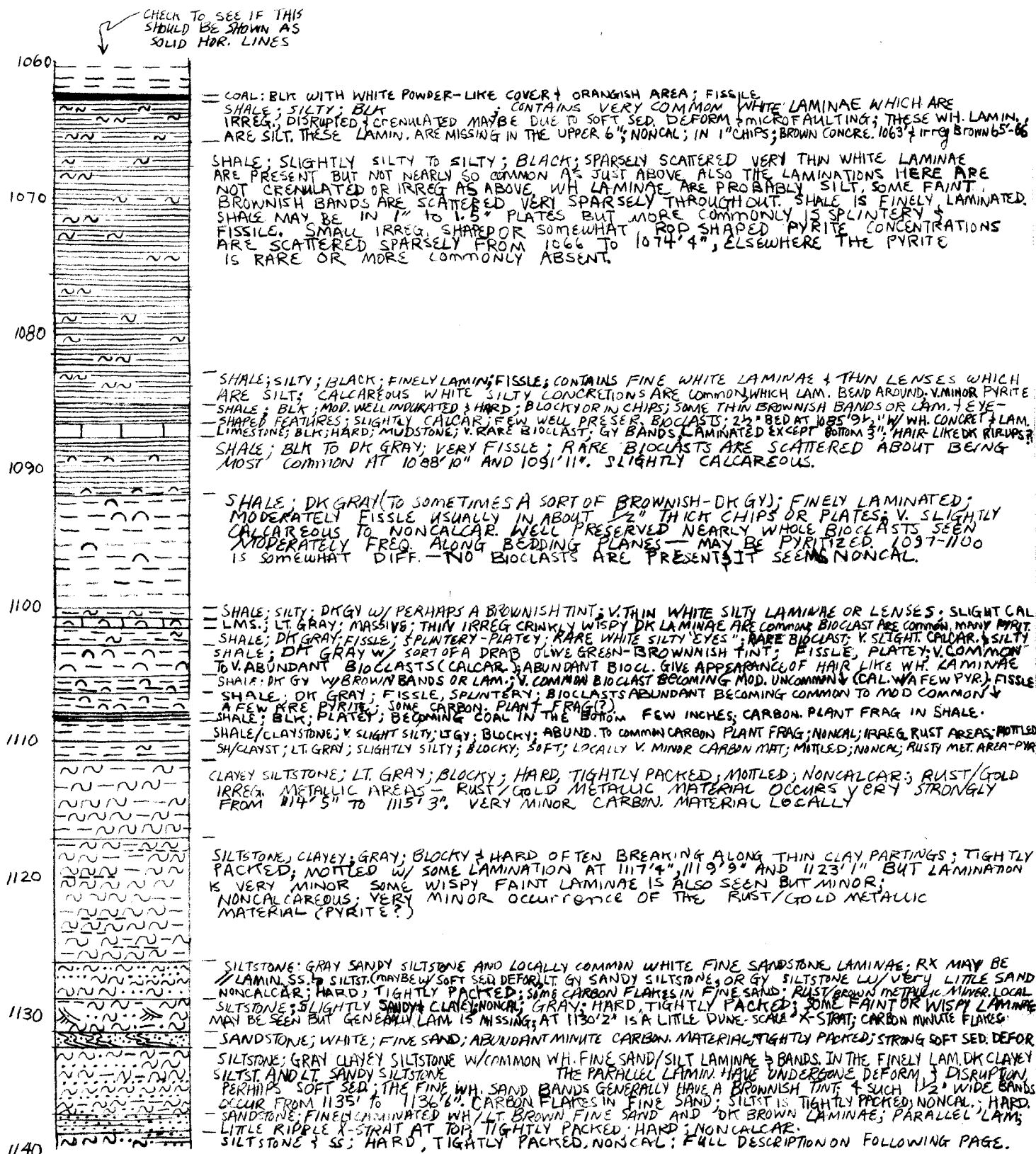
- OIL STAINED FINE SS. LOCALLY FLASER BEDDED IN TOP PART BUT FINE EVEN LAM. IN REST. NONCALCAR.

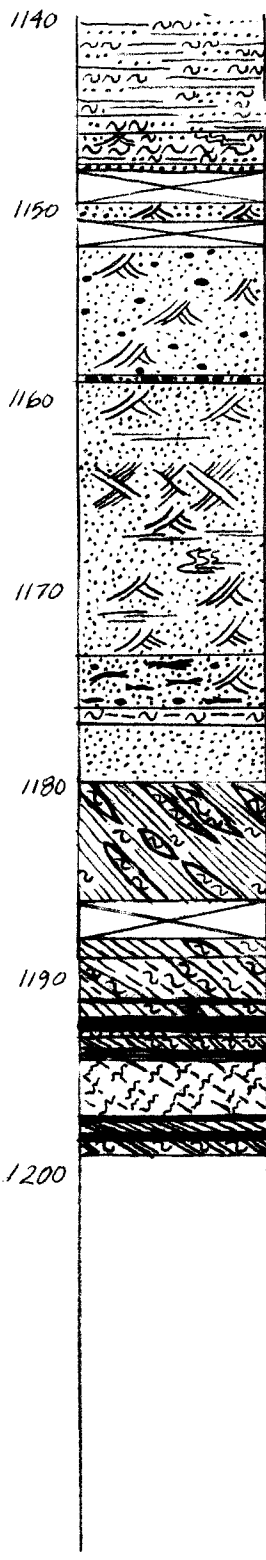
- SANDSTONE; DK BROWN/BROWN; STRONG/MOD. STRONG OIL STAIN; NO OBVIOUS BEDDING; CARBONACEOUS SPECKS; 2" SILTY SHALE 965'

SANDSTONE & SILTY SHALE; BROWN & DK GY; 4 RX TYPES ARE SEEN (1) MED. TO FINE MODERATELY OIL STAINED SS. BEDS ARE SEEN AT 967' (4"), 968'3" (4"), 970'9" (13") INCLUDING THREE 1" SILTY SHALE LAYERS) & 972'10" (5"). THESE SS BEDS SHOW NO OBVIOUS STRATIF. CONTAIN CARBON. SPECKS & STRINGERS. (2) FINE, EVENLY LAMINATED DK SILTY SH & FINE TO MED GRAIN BROWN SS (3) SOME FLASER BEDDING OF SS & SILTY SH (4) FINELY LAMINATED DK GY SILTY SHALE BEDS USUALLY < 1" THICK. OCCASIONALLY SEE SHALE RIP UPS IN SS BEDS (971' & 973') NONCALCAR.

SANDSTONE; LT. BROWN, SLIGHTLY OIL STAINED; WELL SORTED, QUARTZOSE SAND; CARBONACEOUS SPECKS STRONGER & FRAG. THROUGHOUT; MOD. FRIABLE. CLAY MATRIX. STRATIFICATION IS FAINT BUT IT APPEARS THERE IS (1) HORIZONTAL GRADING INTO LOW ANGLE HORIZONTAL (2) HIGH ANGLE DUNE SCALE X-STRAT (3) "HOMOGENEOUS" 973'10" TO 975'4" APPEARS MASSIVE OR HOMO.; 975'4" TO 975'8" HIGH ANGLE X-STRAT.; 975'8" TO 977' (BOX A) LOW ANGLE HORIZ.







SILTSTONE AND FINE SS; THE RX IS PREDOM. A FINELY LAMINATED SILTSTONE & FINE SAND 1138'10" TO 1140'5" & 1141'7" TO 1143'10" IS A PARALLEL, EVENLY, LAMINATED DK SILTST & LT GY TO WHITE SILTSTONE TO SANDY SILTSTONE; 1140'7" TO 1142' AND 1143'10" TO 1146' IS PREDOM. A LAMINATED WHITE FINE SS. & DK SILTSTONE, THE FINE SS BEING MORE COMMON THAN IN ABOVE DESCRIBED LAMINATED RX AND THESE SED SHOW A SOFT SED DEFORM; RUST/BR AREA CHARS SOME DK SILTST; X-LAMINATION AT 1140' AND MAYBE 1142'5" (?)
SS AND SILTSTONE; 1146'6" TO 1146'6" IS WH FINE SS & DK SILTST MAY HAVE SHOWN DUNE SCALE X-STRAT BUT NOW LAM. ARE DEFORMED; 1146'6" TO 1147' DK GY SILTSTONE (CLAYEY) NOW MOSTLY BROWNISH STAINED; 1147' TO 1147'8" RIPPLE & LAM SS & SIL.

— SAME AS DESCRIPTION IMMEDIATELY BELOW

SANDSTONE; V. COARSE; BROWN; POORLY SORTED; DUNE SCALE X-STRATIFIED; TIGHTLY PACKED; NONCAL;

SANDSTONE/CONGLOMERATE, COARSE SAND TO GRANULAR IS UPPER SIZE LIMIT; BROWN; GENERALLY POORLY SORTED; TIGHTLY PACKED. NOT FRIABLE; NONCALCAR; IMMATURE; DEGREE OF ROUNDING & SPHERICITY ARE NOT HIGH; 1151' TO 1151'3" DEFORMED BEDDING; 1151'3" TO 1151'4" SHALE BED; 1152'2" TO 1153'1" MED. GRAIN SAND SHOWING LOW ANG. DUNE SCALE X-BEDDING; 1151'4" TO 1152'2" AND 1153'1" TO 1154' DUNE SCALE X-BEDDING; CARBON PARTING AT 1154' & 1155'; 1154' TO 1155'8" MASSIVE FAINT HINT OF DUNE X-BED; 1155'8" TO 1156'2" LOW ANG. X-BED OR HORIZ; 1156'2" TO 1157'10" DUNE X-BEDDING; 1157'10" TO 1158'2" MASS. OR FAINT HORIZ. CONGLOM; BROWN; POORLY SORTED; LARGE (3 cm long) BROWN SHALE CLAST & OTHER CLASTS IN BROWN MED. SS.

SANDSTONE; WHITE TO VERY LT. TAN-GRAY W/ LT. BROWN-GRAY LAMINAE; WELL SORTED, QUARTZOSE, FINE TO MED-FINE SAND; NONCALCAR, CLAY MATRIX, FRIABLE; MATURE, SAND; 1159' TO 1160' MASSIVE WITH A FAINT HINT OF DUNE X-BEDDING; 1160' TO 1161'3" FAINT LOW ANGLE DUNE X-STRAT; 1161'3" TO 1161'8" HORIZONTAL; 1161'8" TO 1162'5" DUNE X-STRAT; 1162'5" TO 1163' MASSIVE; 1163' TO 1166' DISRUPTED DUNE X-STRAT. LOOKS LIKE SOFT SED. FAULTING CAUSING AN OFFSETTING OF LAMINAE; 1166' TO 1167'11" DUNE X-STRAT SOME LOW ANGLE AND A LITTLE HORIZ-STRAT AT 1167'; 1167'11" TO 1169' HORIZ-STRAT & SOME SOFT SED DEFORM.; 1169' TO 1170'11" DUNE SCALE X-STRAT.; 1170'11" TO 1171'6" FAINT HORIZ.; 1171'6" TO 1173'2" DUNE X-STRAT.

SANDSTONE; BROWN TO A LT. BR-GY; MED. GRAIN SAND W/ ABUNDANT CARBON STRINGER AND FRAGS SOME 3 TO 4 CM LONG ALSO CARBON PARTING ARE SEEN; SAND IS TIGHTLY PACKED; OCCASIONAL BROWN SH CLAST ARE SEEN & ARE LARGEST AT 1176' (2 cm long); APPEARS TO BE PREDOM DUNE X-STRAT MAYBE SOME HORIZ. NONCAL.
CLAYEY SILTSTONE; FINELY LAMIN GY CLAY & WH SILT; LAM ARE REG. EVEN, & A MINOR SOFT SED DEF; BR STAINED AREA IN SANDSTONE; WH TO A VERY LT. GY TAN; FINE SAND TIGHTLY PACKED, SLIGHTLY FRIABLE; IN MINOR AMT ARE SCATTERED VERY SMALL CARBON. FRAGS; WELL SORTED; QUARTZOSE; NONCAL; THE SAND APPEARS TO BE MASSIVE OR HOMO. BUT MAY BE V. FAINT HINT OF DUNE X-STRAT 1177'4" TO 1178'

SHALE; BLACK; OFTEN IN WEDGE SHAPED PLATES; PLATES OFTEN HAVE SMOOTH, SHINY "POLISHED" SURFACES, PERHAPS DUE TO MOVEMENT ALONG BEDDING SURFACES IN THE SH DUE TO OVER-BURDEN OF THE SS ABOVE; SH CONTAINS LT GRAY SILTY LAMINAE AND EYE-SHAPED FEATURES. THE BLK SHALE ITSELF MAY BE SILTY OR IT MAY APPEAR TO LACK SILT. WHEN SILT IS ESPECIALLY COMMON THE "POLISHED" SURFACES REFERRED TO ABOVE ARE LESS WELL DEVELOPED; THE SILTY LAMINAE ARE AT A HIGH ANGLE TO HORIZONTAL; OCCASIONALLY THE SH MAY SHOW A BROWNISH STAIN; NONCALCAR; OCCASIONALLY SEE WHAT LOOKS LIKE A WHITE MINERAL PERHAPS OCCURRING AS A FRACTURE FILLING MAT. SILTY SHALE; BLK TO DK GY; LIKE THE ABOVE HOWEVER WH SILTY LAMINAE ARE VERY COMMON HERE; AGAIN LAMINAE ARE AT A HIGH ANGLE; SHALE HERE IS QUITE SILTY; NONCAL; SOME BROWN STAINING
COAL & SH; 1191'1" TO 1191'4" IS COAL W/ MAYBE 1" UNDERCLAY; 1191'4" TO 1192' IS BLK SHALE W/ OCCASIONAL LT GY SILTY LAMINAE AT A HIGH ANGLE TO HORIZON; 1192' TO 1193' IS COAL WITH ABOUT 2" OF GY UNDERCLAY SHALE; BLK; 1193' TO 1193'8" IS BLK SH W/ ABUND LT GY SILTY LAM AT A HIGH ANGLE; 1193'8" TO 1194'4" CARBON BLK SHALE & COAL
SHALE PROBABLY ACTUALLY AN UNDERCLAY; LT GRAY; SOFT; SILTY; EASILY BROKEN INTO SMALL "CHUNKS"; CONTAINS CARBONACEOUS FRAGMENTS; NONCALCAR; HAS A SHINY "SOAPY" APPEARANCE IN PART DUE TO MOVEMENT AS DESCRIBED ABOVE; BLK FISSLE SH BED 4 1/2" THICK AT 1196'6"
COAL AND SHALE; BLK, FISSLE, NONCAL SHALE.
SHALE; BLK SILTY SHALE WITH COMMON, WISPY, LT GRAY SILTY LAMINAE AT A HIGH ANGLE TO HORIZONTAL; NONCALCAR

samples for photography (?)

Box		Depth
8-9	whit. sd-sh-carb. sd	1176'
8-8	" " - carb. sd	1173'
8-7	x-beds in whit. sd	1172'
8-5	" faults in sd.	1163'
8-3	conglom. - bon. lithol. sd	1158'
8-1	x-beds in litho. sd.	1153'
7-14	" faults in sd-sh-slt.	1141'
7-13	bedding of sd-sh-slt.	1138'
7-12	small scale flow-rolls in sd (in sh)	1135'
7-6	sid. sh	1116'
6-12	blk sh, sli. silty	1084'
6-8	blk sh	1072'
6-5	blk, sid. sh, sli. silty	1064'
6-1	gnish, silty sh, fine lam.	1052'
5-8	sid. underclay	1045'
5-6	sid. sh	1040'
5-3	coal	1030'
5-1	Sid. Sh.	1023'
4-16	lt gy. pyr. ss / blk. sh (dk. gy)	1022'
4-15	congl. / lt gy fine ss	1018'
4-14	congl.	1017'
4-13	x-bed gy-bon. ss, carb. ss	1013'
4-6	diff. str. of x-beds gy ss	992'
4-2	bedg in gy. ss	980'
3-17	whit. calc. ss	976'
3-15	flaser bed. ss-sh	970'
3-13	" " "	964'
3-10	" " "	953'
3-8	oil str. ss (sh. cont. w/sh)	950'
3-7	" " " " & flaser	947'
3-4	pane-like silt-sh interbed.	935'
2-15	burrowed ss-sh, sid. silt.	920'
2-14	flaser bed ss-sh	916'

over

1-15	plain gy. sh.	870'
1-14	Silty sh, burrowed, sli. foss.	866'
1-13	v. argill. Ls.	865'
1-8	varved sh-slat.	848'
1-7	cont. bdg slat.	844'
1-5	ss-sh interbd. (sli. oil st.)	838'
1-2	blk Ls-sh.	830'

1199 ~~sooty blk sh; soft, thin coats, light carb~~

Row PP

PP

C. L. 18 AO - Krown

Allen Co., Ks.
NE NW SW 22-23S-18E

Cored
Run

cored

we have

boxes

1	826-76	all	17						
2	876-926	all but 924-26	16						
3	926-76	all	17						
4	976-1023	all	16						
5	1023-49	all	9						
6	1050-1100	all but 1068-71	16						
7	1100-49	all	17						
8	1151-80	all	10						
9	1180-99	all	7						
			Total 125						
1	826-29	76-79	926-29	976-79	1023-26	50-53	1100-03	51-54	
2	829-32	79-82	929-32	79-82	1026-29	53-56	1103-06	1154-57	80-83
3	832-35	82-85	32-35	982-85	29-32	56-59	106-9	57-60	83-86
4	35-38	85-88	35-38	85-88	32-35	59-62	09-12	60-63	1186-89
5	38-41	88-91	38-41	88-91	35-38	62-65	12-15	1163-66	89-92
6	41-44	91-94	41-44	91-94	38-41	65-68	15-18	66-69	12-95
7	44-47	94-97	44-47	94-97	41-44	68-71	18-21	69-72	95-98
8	47-50	97-100	47-50	997-1000	44-47		21-24	72-75	98-99 TD
9	50-53	100-03	50-53	1000-03	47-50	71-74	24-27	75-78	
10	53-56	03-06	53-56	03-06		74-77	27-30	78-80	
11	56-59	06-09	56-59	06-09		77-80	30-33		
12	59-62	09-12	59-62	09-12		80-83	33-36		
13	62-65	12-15	62-65	12-15		83-86	36-39		
14	65-68	15-18	65-68	15-18		86-89	39-42		
15	68-71	18-21	68-71	18-21		89-92	42-45		
16	71-74	21-24	71-74	21-24		92-95	45-48		
17	74-77		74-77			95-98	48-51		
18						98-100			

~~1199 sooty blk sh; soft, thin coals, lt. gy carb.~~

1199 intld: sooty, platy blk sh - some incl. silt lamin.
-91 thin, soft coal
blocky, lt. gy carb. sh

1191 -80 est. contort. (plastic, compacted? beneath overlying sd?) dk gy sh w/ horiz.
& inclined thin silt lamin.; tr. silt lamin.

11

COLT
18-AO
KEOWN
NE NW SW
22-33S-18E
Allen Co. Ks

800

add ~ 1'
to core
depths to
match log

373' E
Continuum
core

826

Coal
cl. st.

oil sat. ss

Sh + ss lam.

lam. (grad.?)

Sh + ss
oil sat.

sl. carb. Sh

less silty

ls, silty, sh, foss.

slit-shirreg. lam.

at top, less

silty & darker

sl. foss. at top

Sh, varies in

darkness and

calc. in this

interval

siltier below

here (varied)

9.70

thin int. bed.

(flaser, wavy

lamin.) oil sat.

ss - gy Sh

oil sat. ss

1000

1022' 4"

1100

1200

contorted little sh.

1199

LS, gy, mott., v. shly (burrowed & dist. bed) silty foss.
Sh, mott. silty foss. (Brach)
sh, blk, lam, phos. & blk. ls

no depth corr. needed

1' corr. to core depth to match log