

FROM	TO	±MM	AS. 4Y				GAL/TON	DESCRIPTION
			10	20	30	40		
170	180							NO SAMPLE TOO MUCH CEMENT MIXED
180	190							" " WITH ROCK
190	200							" " " "
200	210							VERY FINE DUST TYPE MATERIAL
210	220							" LIGHT GRAY TO DR. BROWN
220	230							"
230	240							"
240	250							"
250	260							"
260	270							VERY FINE DUST TYPE MATERIAL
270	280							" DARK BROWN TO REDISH
280	290							" BROWN
290	300							" (AQUIFER 300-330 CONTACT BETWEEN SS+SH)
300	310							" DRILLING RATE SLOWED DOWN SHALE
310	320							"
320	330							NO SHINGLE (AQUIFER H ₂ O ZONE IS CATCHING, CUTTING)
330	340							" "
340	350							" "
350	360							" "
360	370							" "
370	380							" " CLEAN NO DISTURBANCE
380	390							" " LEFT SIDE OF H ₂ O
390	400							SS+SH LIGHT GRAY TO GREEN + RED BROWN
400	410							" " " "
410	420							" " " "
420	430							" " " "
430	440							SH - DARK BROWN TO REDISH BROWN
440	450							"
450	460							"
460	470							" { VERY FEW CHIPS AS BIT
470	480							" { GRINDS THE MATERIAL TO
480	490							" { VERY FINE.
490	500							"
500	510							"
510	520							"
520	530							"
530	540							"
540	550							"
550	560							"
560	570							"
570	580							"
580	590							"
590	600							"
600	610							"

DEPTH	±MM	FRX	PP	ASSAY 10 20 30 40	GAL TON	REC. 8 9 10	LITH.	DESCRIPTION
800	+127							OIL SHALE - LOW TO MEDIUM GRADE
01		I 98	.14					WITH A FEW ZONES OF HIGHER
02			.00 AI					LIGHT TO MEDIUM BROWN - HG.
03			.07 .36					BLACK - SAND LAYERS PRESENT
04			.11					BUT THIN
05			.31					
06			.55					
07	+120							807.0 - .2 SAND LAYER WITH SULFIDE MINE
08			.72					
09		I 98						
810			.36 .91					810.36 - 812 HIGHER GRADE ZONE BLACK
11			.38					
12								
13								
14								
15								
16								
17	+110		.85					817.35 - 819 HIGHER GRADE ZONE DRK. BRN
18								
19								
820								820.4 - .56 SAND LAYER
21								
22			.68					822.56 - 823 SAND LAYER OIL SATURATED
23								823.17 - .37 " "
24								
25								
26			.32					826.00 - .26 SAND LAYER OIL SATURATED
27	+100							
28								
29			.28					829.00 - .20 SAND LAYER SULFIDE MINE
830								830.65 - 831.1 " " OIL SATURATED
31								
32								
33								LOW GRADES OIL SHALE
34			.00					
35			.69					
36								
37	+90		.11					838.65 - .90 SAND LAYER OIL SATURATED
38								
39								
840								840.00 - .35 SAND LAYER OIL SATURATED
41								
42								
43								
44								
45			.A6					
46								
47	+80							
48			.23					
49								

ADD 16' TO ALL
NUMBERS

COMMENTS:

THE CLEVELAND CLINTS IRON CO. PROJECT WKS
HOLE NO: X-9 SHEET 2 OF DATE: 1/7/75 LOGGED BY: W. Moulton COLLAR: TD:

DEPTH	±MM	FRX	PP	ASSAY 10 20 30 40	GAL TON	REC. ERGD	LITH.	DESCRIPTION
450		T90	.9					LOW TO MEDIUM GRADE SHALE
51								
52								
53								
54			.47					
55			.42					
56								
57	+70							857.85-859.75 UPPER WAVY BED
58								BE CONTORTED, OIL SATURATION
59								SAND LAYER
600			.53		460.53			860.53-861.5 HIGHER GRADE ZONE DKK BE
61								
62								
63			.05					
64								LOW GRADE SHALE HARD + HEAVY
65								
66								
67	+60							
68								
69								
470								
71								
72		T90	.01					
73								
74			.35					
75								
76								
77	+50		.77					
78								LOW TO MEDIUM GRADE SHALE
79								
880								
81								
82			.82					HIGHER GRADE ZONE 882-884
83		T45						
84								
85								
86								MEDIUM GRADE ZONE
87	+40		.00					
88								
89			.30		890.80			
890								
91								LOW GRADE SHALE WITH SOME
92								← RICHER ZONES - SMALL
93								
94			.76					
95			.48					
96								
97	+30		.05 .90					
98			.30 .60					
99								

WHITE UNK EMBL'D MATTER

HOLE NO: X-9 SHEET 3 OF DATE: 11/7/75 LOGGED BY: W. MOWEN COLLAR: TD:

DEPTH	±MM	FRX	PP	ASSAY 10 20 30 40	GAL TON	REC. RGD	LITH.	DESCRIPTION
900			102					
01			76.62					LOW GRADE SHALE
02								
03			83					
04			10					
05								
06								
07	+20							902.5-908.5 HIGHER GRADE SHALE
08								
09			91					908.75-910.1 CREAM COLORED SAND LENS
910								SULFIDE STRINGERS PRESENT
11			106					
12			25					
13			11.51					913.11 - S1 SAND LAYER OIL SATURATED
14								
15			132					
16								
17	+10		93					HIGHER GRADE SHALE
18								
19			169					
920								
21			22					
22								LOW TO MEDIUM GRADE SHALE
23								IN UPPER PART OF RUN - (MAHOGANY
24								ZONE) HIGH GRADE IN MIDDLE
25								AND LOWER PART OF RUN
26			130					926.75-927.2 MAHOGANY MARKED
27	0	.00	31.57.88					NOT TYPICAL - NOT OIL SATURATED
28			21.50					CREAM COLORED.
29								
930			129					
31			34					HIGHER GRADE ZONE
32								
33			163					934.2 - A SAND LAYER OIL SATURATED
34								934 START HIGH GRADE ZONE
35			74					MAHOGANY ZONE
36								
37	-10		11					
38			15.90					
39			14.77.93					
940								
41			40.52.60					LOST CORE
42								
43			127					
44								
45			117					MEDIUM GRADE SHALE
46								
47	-20							
48								
49			181					946.65-75 SAND LENS

COMMENTS: LOST CORE IN MAHOGANY ZONE - GROUND UP
ACCORDING TO DRILLER DEPTH AT 952
50 LOST 2.11' - SAY FROM (949.89 TO 952)

LOST 30.60 9:00 PM 11/7/75 W. MOWEN

THE UNIVERSITY OF MONTANA PROJECT: W
 HOLE NO: X-9 SHEET 4 OF 4 LOGGED BY: W. Moulton DATE: 1/8/75 COLLAR: TD:

DEPTH	±MM	FRX	PP	ASSAY 10 20 30 40	GAL/TON	REC. GRQ	LITH.	DESCRIPTION
950							X	LOST CORE
51					9500			" "
52								952 - 956 HIGH GRADE ZONE
53								DRK BRN TO BLACK
54								
55								
56								LOW TO MEDIUM GRADE
57	-30							
58								
59								958 - 962 HIGHER GRADE ZONE
960			.73					BANDED DRK BRN TO BLACK
61			.96					
62								
63			.58					LOW TO MEDIUM GRADE
64			.00					
65			.22	100				
66								
67	-40							
68								
69								
970			.76					
71								
72								
73			.91					
74								
75								
76			.7					LOW GRADE SHALE
77	-50							
78								
79								
980			.7					
81								
82								
83					9800			RUBBLE ? (BREAKS MECH.)
84			.13	34				
85								
86			.57	80				98657-.92 SAND LAYER ON SATURATED
87	-60	I 90	.30					98713-.989 HIGHER GRADE ZONE
88								DRK BRN TO BLACK
89								
990								LOW GRADE SHALE
91								CREAM COLORED TO LIGHT BROWN
92			.18	95				
93								
94			.162					
95			.97					
96			.12	AB				
97	-70		.100	.22 .98 .73				
98			.36					
99								

COMMENTS:

1/8/75

HOLE NO: X-D SHEET 5 OF DATE: 1/9/75 LOGGED BY: W. Moulton COLLAR: TD:

DEPTH	±MM	FRX	PP	ASSAY 10 20 30 40	GAL/ TON	REC. ERGD	LITH.	DESCRIPTION
1000			106.71					LOW GRADE SHALE
01			37.77					CREAM COLORED TO LIGHT BROWN
02			32.90					1001.37-1002.90 SAND LAYER - INNER
03			30					BEDDED SHALE
04								
05			31					
06			63					
07	-80							
08			65					LOW GRADE SHALE
09								CREAM COLORED TO
10.10			36					LIGHT BROWN
11								
12				(1013.83)				
13			33	1013.33				(LOST 30' FOOT BOTTOM OF HOLE)
14								
15								LOW GRADE SHALE WITH ZONES
16								OF OZZING DEAD OIL - MOSTLY
17	-90							IN SAND LAYERS - THINLY
18			58					BEDDED
19								
10.20								
21								
22			57					1022-1025,
23			71					
24			25					1023-1025 OZZING OIL ZONE
25								
26								
27	-100							
28								LOW GRADE SHALE
29			53					
10.30			37.80					1030.37-40 SAND LAYER OIL
31								SATURATED
32								
33								
34								
35								LOW GRADE SHALE
36								
37	-110							
38								
39			77					
10.40								
41								
42			91					
43			48.55	1043.53				
44								LOW GRADE SHALE WITH ZONES
45			75.789					OF MEDIUM TO HIGH GRADE
46			42.62					CREAM COLORED TO DARK BROWN
47	-120							TO BLACK
48			37					
49			1					HIGHER GRADE ZONE

COMMENTS:

HOLE NO: X-9 SHEET 6 OF DATE: 1/9/75 LOGGED BY: W. Moulton COLLAR: TD:

[illegible]