

1161

G.D.A. | C.J.H.

C.J.H.

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G.D.A.

COMMENTS:

FROM	TO	IMM.	DESCRIPTION
0	7		OVERBURDEN
7	22		
22	30		Siltstone, Brn, mod. calc.
30	40		Siltstone, Brn, slightly calc.
40	50		Siltstone, lt. Brn., slightly calc., pyrite, carbon flecks
50	60		Siltstone, Brn., pyrite, slightly calc.
60	70		Siltstone, Brn., slightly calc., pyrite
70	80		Siltstone, lt. brn to gry, arg., slightly calc., few carbon flecks
80	90		Siltstone, brn to dk grey, mod. to thin lam., st. calc., mica on PP, *
90	100		Siltstone, brn, mod calc., with buff f.gr. SS
100	110		SS, f.gr., grey, non calc. (Some mod gr.)
110	120		Siltstone, brn to dk brn, mod. calc., * MINOR mica flecks
120	130		Siltstone, brn to dk brn, mod calc., mica on PP, buff, f. SS, mod calc.
130	140		Siltstone, dk brn, mod calc., mica flecks (w occasional f. buff SS)
140	150		Siltstone, Brn to dk brn, sly. calc., mica flecks
150	160		SS, f.g., buff, mod calc., pyrite w siltstone, dk brn, sly. calc.
160	170		Siltstone, f. lam., lt to dk brn, sly. calc., mica flecks
170	180		Siltstone, dk brn, mod. calc.
180	190		Siltstone, dk brn. f. SS, lt. gry, w Hcarbon flecks & pyrite
190	200		SS, lt to mod grey, pyrite, Hcarbon flecks
200	210		SS, lt grey, f.g. & siltstone, dk brn.
210	220		Siltstone, dk Brn, w. calcite & nahcolite pod f. SS, buff, calc
220	230		Siltstone, dk Brn, nahcolite blebs, mod calc.
230	240		Siltstone, brn to dk brn, nahcolite, st. to mod. calc., minor buff SS
240	250		Siltstone, dk brn, abund. nahcolite & calcite (highly eff.)
250	260		(Same as above)
260	270		Siltstone, brn to grey, non calc, w calcite & pyrite x-tals on surfaces
270	280		Siltstone, dk brn, calcite oolitic texture, nahcolite; calcite effervesces but not rock
280	290		Siltstone, dk brn, mod test. calc. (Marlstone?) nahcolite pods
290	300		Siltstone (Marlstone) brn, mod to st. calc, w some dk br v.f.g. SS
300	310		Sandy Siltstone (qtz & pyrite grains), lt brn, mod calc, w some dk brn siltstone
310	320		Siltstone, dk brn, w calcite & nahcolite blebs, mod calc, w buff f.g. SS
320	330		Siltstone, dk brn, thin lam, mod to st. calc (Marlstone), w minor calcite & Hcarb
330	340		Siltstone (Marlstone), dk brn, mod. to st. calc, w calcite & nahcolite Hcarb
340	350		Siltstone (Marlstone) brn, mod to st. calc., w minor calcite & Hcarb
350	360		Siltstone (Marlstone) lt. to dk brn, mod. to st. calc., minor pyrite
360	370		(Same as above)
370	380		Siltstone (Marlstone), brn, mod to st. calc.
380	390		Siltstone (Marlstone), dk brn, mod. calc., w calcite & pyrite x-tals
390	400		Siltstone (Marlstone) dk gray to brn, thin lam, mod to st. calc.
400	410		Siltstone (Marlstone) dk gray to brn, mod to st. calc, minor pyrite, Hcarbon, & magnetite
410	420		Siltstone (Marlstone) gray to brn, mod. calc., w galenite, Hcarbon, & pyrite flecks
420	430		Siltstone (Marlstone) dk brn, mod to st. calc
430	440		Siltstone (Marlstone) dk brn, mod to st. calc
440	450		Siltstone (Marlstone) dk brn, mod calc, w pyrite
450	460		Siltstone, dk brn, sly. to mod. calc., mica on PP, minor galenite-Hcarbon
	460		11/26/74 START CORING

CLEVELAND CLIFFS IRON CO. PROJECT: TRACTS 4 & 46 - WHITE RIVER OIL SHALES
HOLE NO: X-2 SHEET 1 OF DATE: 11/27/74 LOGGED BY: G.D. HANSON COLLAR: 5010(3) TD: 765.84

DEPTH	±MM	FRX
460		
461		
462		
463		
464	4.20	
465	5.90	
466		
467		
468		
469	9.50	
470		
471	1.58	
472		
473		
474	4.40	
475		
476		
477	7.97	
478	8.04	
479		
480		
481		
482		
483		
484		
485	1.5	
486		
487		
488		
489		

DRILLING CONTRACTOR:

LAYNE WESTERN

RIG: GD 2000

DRILLERS: COX (NIGHT), KAUZLARICH (MIDNITE-NOON)

METHOD: AIR MIST; 6 3/4" Christenson Bit

SERVICE CO: WESTERN AIR.

GEOLOGIC SYMBOLS:

- +++ tuff ss
- *** NAHCOLITE
- BITUMEN FLECKS
- High GRADE OIL SHALE
- H H HEMATITE, PYRITE, OR MARCASITE layers, bte bs, or tence or X-tals

OIL SHALE (siltstone / MARLSTONE)

v.f. lam., dk gray to brn with occasional buff lamina, generally mod. eff. (higher grade zones are MANOGANY color) Few thin tuff ss. lamina as noted.

464.20 - tuff ss, gray to dk gray, 0.02'

464.95 - tuff ss, dk brn, w hearboms, 0.05'

466.30 - same ss as above, 0.05'

471.58 - tuff ss, dk gray, 0.07'

474.40 - tuff ss, dk gray, v. thin, irregular

477.97 - tuff ss, dk gray, 0.05'

OIL SHALE v.f. lam., dk to brn, generally mod. eff., w v. thin tuff ss lam, (thicker ones noted)

479.88 - (0.02') tuff ss, brn w hearboms

479.97 - (0.03') tuff ss, brn w hearboms

481.5 - (0.05) tuff ss, gray

481.92 - (0.02') tuff ss, gray

485.09 - (0.02') tuff ss, dk gray

488.97 - (0.02') tuff ss, gray

COMMENTS:

DEPTH	±MM	FRX	PP	ASSAY 10 20 30 40	GAL TON	REC. ERGD	LITH.	DESCRIPTION
490			0.4				+++	OIL SHALE (as above)
491								
492								490.4 - (0.03') buff ss, gray
493								493.55 491.34 - 491.74 - buff color, siltstone,
494								494.6 v.f. lam, mod. eff.
495								OIL SHALE - below 491.74 (buff zone) the
496								color becomes darker brn to end
497								of run, f lam, mod. calc. oil shale
498								
499								
500								OIL SHALE - predominately dk brn w
501								500.92 some dk gray lam, v.f. lam,
502								501.95 mod. to st. efferv., low to med grad.
503			3.62				+++	except where noted.
504							+++	500.83 - tuff ss (0.1'), lt. br w Harbors
505							+++	502.18 - tuff ss to 502.28 (≈ 0.1'), dk
506							+++	brn, distorted contacts, w Harbors
507							+++	503.6 - dk brn, dk brn tuff ss (0.05')
508							+++	508.23 - tuff ss (0.05') dk brn, w Harbors
509							+++	509.00 - tuff ss (0.05') f. g. silicate fluxes, f
510			0.61				+++	510.15 - tuff ss (0.20') odor
511	+130						+++	510.61 - 519.90 - left in bottom of hole
512							+++	& recovered partially with next 6'.
513							+++	However - much of core was ground
514							+++	up & pieces recovered were badly
515							+++	broken. Most of it is dk brn
516							+++	Oil Shale (silty shale) mod. to st. efferv.
517							+++	≈ 4' of sample recov. out of 9.3' cut,
518							+++	but largely due to faulty core catcher
519							+++	
520							+++	OIL SHALE - brn to dk brn w. few thin
521	+120						+++	buff lamina, v.f. lam, mod. to
522							+++	st. calc., low grade.
523							+++	
524							+++	524.45 - tuff ss (0.08') - dk brn tuff ss
525							+++	525.30 - carrying Harbors, wavy contacts
526							+++	OIL SHALE - brn to dk brn w. tuff ss
527			7.77				+++	as noted. Mod. calc., v.f. lam.
528							+++	Higher grade zones of oil
529			7.09				+++	shale. Mahogany colored. Few
530			0.05				+++	thin buff color lamina.
531	+110		0.55				+++	Tuff ss
532			0.88				+++	520.83 - 526 dk. brn, wavy contacts,
533							+++	527.17 - 7.70 dk. brn, wavy cont's, odor
534			3.97				+++	528.75 - 2.80 dk brn, wavy cont's
535							+++	530.7 - 0.95 dk brn, wavy cont's odor
536							+++	535.77 - 6.33 (same as above)
537							+++	536.47 - 6.53 (" " ")
538							+++	537.00 - 7.09 (" " ")
539							+++	

CREW FINISHED SHIFT AT 9:00 PM 11/27/74 & STARTED UP 11/28/74 AT 8:00 AM WITH ONLY ONE SHIFT, BECAUSE OF TRANSGUING SOME OF CREW LEFT. 11/28 DID MAINTENANCE WORK ALL DAY. Went back in over core to get ground up. put & drilled another 6' to 525.48.

COMMENTS:

650

8.47
9.31
9.42

20.1 sec/20.03 cut
RQD = 19.2/20.1

DEPTH	±MM	FRX	PP	ASSAY 10 20 30 40	GAL TON	REC. ERQD	LITH.	DESCRIPTION
540							+++	<u>Oil Shale</u> brn to dk brn, mod calc, v. fi lam, w few buff lamina.
541	+100							
542			2.07				+++	Tuff ss { 540.18-0.23 } dk brn, wavy
543							+++	542.56-2.63 } contacts, w
544		45°	4.15 4.20				+++	544.17-4.20 } Hycarbons, some
545							+++	545.69-546.10 } gilsonite, odor
546							+++	<u>Oil Shale</u> - brn to dk brn, f. lam,
547							+++	mod. to st. calc., low grade
548							+++	
549			9.68				+++	Tuff ss { 549.53-9.60 } dk brn, irreg.
550								549.78-9.88 } contacts, w
551	+90							554.58-4.65 } Hycarbons, gilsonite
552								flcks, odor
553								
554			4.62				+++	silty shale - buff colored, st. calc., low grad.
555								(555.85 to 556.85)
556			6.0					<u>Oil Shale</u> - brn to dk brn, f. lam, mod to st.
557								calc., low to med. grade
558			8.09					
559								tuff ss { 561.43-1.48 } brn, zone zone w
560								Hcarbns
561	+80		1.43 1.48				+++	tuff ss { 564.11-4.16 } dk brn, Hycarbns
562								odor
563								
564								3.96 565.04
565			5.65				+++	Tuff ss (565.01-566.71) - tan to brn
566			6.61				+++	to dk, low Hycarbns, mica & magnetite
567			7.84				+++	grains, highly distorted bedding & contacts
568							+++	non-calc. <u>UPPER WAVY BED</u>
569							+++	<u>Oil Shale</u> (6-71 →)
570								brn to dk, f. lam, mod. calc., low to
571	+70							med grade oil shale, few v. thin
572			2.90					high grade seams - larger ones noted.
573								3.20 5.83
574								Tuff ss's
575							+++	569.08 (.02') } dk brn, v. little
576								575.02 (.02') } Hycarbns
577								
578			8.10					
579								
580								
581	+60							
582								
583								
584								
585								<u>Oil Shale</u> - brn to dk. brn, f. lam., mod.
586								6.91-6.96 offer., med. grade oil shale. w.
587								few higher grade zones
588								
589								

COMMENTS: NOTE 565.98 to 568 - 2 feet drilled on 12/2/74 before engineer broke down; run finished on 12/2/74; 1' drilled as such on log.

DEPTH	±MM	FRX	PP	ASSAY 10 20 30 40	GAL/TON	REC. ERD	LITH.	DESCRIPTION
590								Oil Shale (as above, continued)
591	+50						1.60	
592							3.20	w. few buff colored seams of silty shale as listed: (594.55-4.60)
593								(602.18-2.24)
594								(605.38-5.45)
595								
596								
597								
598								
599							9.32	Tuff ss. (599.69-599.75)
600							0.59	
601	+40							
602								
603							3.43	
604							4.46	
605								
606								
607			7.15					Oil SHALE - low grade, silty shale, brn to buff, w. calcite filled cavities (607.25 to 611.88) - calcite cavities from (611.55-611.70)
608			7.39					
609			9.20					
610								Oil Shale
611	+30		1.30				1.88	gray to dk. gray, med. grade oil shale from 611.88 to 617.85 w. higher grade zone from 617.85 to 621.23
612			2.46					
613			3.18					
614			4.55					
615			4.80					
616			6.00					
617			7.42					LENSES & blebs of tuff ss from 621.40 - 623.50
618							7.85	
619			9.37					Oil Shale shows irregular, wavy, laminated from 620.09-625.00.
620			0.26				1.23	
621	+20							
622								Oil Shale - dk brn to gray low to med grade oil shale, mod calc.
623			3.04					
624								
625			5.10				5.33	Tuff ss, blebbing & carbons (624.74-4.78) (625.05-5.09)
626			6.05					Oil Shale (625.31-627.80) (625.23-5.31)
627							7.80	brn to dk brn w. some buff lamina, med to high grade oil shale, thin, lam, & distorted bedding
628								
629								
630							0.16	
631	+10		1.34				1.68	626.04 - 6.40 tuff ss, dk brn to 626.44 - 6.48 dk gray, distorted contacts, contains magnetite & minor carbons
632								
633								
634								
635			5.29					631.18-621
636								631.98-632.13
637								Oil Shale (631.68-637) low to med grade, tan to lt. brn, mod to st. eff.
638			8.19					
639			9.80					

COMMENTS:

HOLE NO: X-2 SHEET 5 OF DATE: 12/4/74

LOGGED BY: G.D. AND C.J. HANSON COLLAR: TD:

DEPTH	±MM	FRX	PP	ASSAY 10 20 30 40	GRV TON	REC. G RD	LITH.	DESCRIPTION
640			0.42					OIL SHALE (637 →) brn to gray, thinly
641	0		1.67					lam., low to med grade, med. efferv.
642								
643								Tuff ss
644								641.43-641.18 } f. grained, dk brn
645			5.69					641.45-1.50 } to blk, magnetite,
646								641.71-1.73 } minor Hycarbons
647								Oil Shale - buff to lt. brn to reddish
648								7.83 dk brn, f. lam., mod. calc., med
649								grade; with higher grade zones
650			0.13					being mahogany to black in color.
651	-10		0.43					
652								Thin (0.02') tuff ss, lt gray at 653.0
653								
654			4.03					
655			4.00/0.88					
656								5.0
657								CORE BADLY BROKEN - MANY v. thin poker chip
658								pieces, apparently zone of lost core, all
659								pieces are high grade oil shale
660								
661	-20		1.20					0.70
662			1.50					1.67 } ZONE of solid crystals of NaHCO ₃
663			2.60					featite, highly efferv. only partially
664			2.80					dissolved. Some of crystalline material
665			3.0					is translucent brn in a vitreous to
666			3.45					waxy luster - A very distinctive zone
667			4.30					
668								5.74 Tuff ss - 665.74-665.95 (brn w/
669								5.0 waxy bedding)
670								Oil Shale
671	-30		1.58					dk brn to mahogany to blk,
672			2.76					high grade oil shale, f. lam.,
673			3.71					mod. calc. - Higher grade
674			3.71					zones only slightly efferv.
675			3.71					
676			3.71					
677			3.71					
678			3.71					
679			3.71					
680			3.71					
681	-40		1.33					Oil Shale - dk brn, f. lam, mod. calc.,
682			2.11					low to med grade (680.0-684.55)
683			4.13					
684			5.47					684.55 to 685.47 - waxy bedding
685								in oil shale
686								Oil Shale buff to dk brn, f. lam.,
687								mod efferv., low to med grade
688								except where higher grade noted.
689								

COMMENTS: * Extra core apparently left on bottom from last run, had to adjust
FOOTAGE MARKED ON CEE (RQD = 41.95/20.05)

HOLE NO: X-2 SHEET 6 OF DATE: 12/5/74 LOGGED BY: G.D. RHO COLLAR: TD:

DEPTH	±MM	FRX	PP	ASSAY				GAL/TON	REC. REQD	LITH.	DESCRIPTION
				10	20	30	40				
690											0.45
691											
692											2.38
693											2.58-2.70 - H. brn tuff ss w.
694			4.33								Naheolite & calcite
695											
696											
697											
698			8.68								
699											-9.14
700			2.25								9.27
701	760		0.91								
702											2.05
703											2.25
704			704.74								702.82-2.87 } Tuff ss - dk gray
705			4.92								703.08-3.12 } to brn w magnetite
706			6.20								Oil shale
707			6.23								pyrite, & hycarb. boxes
708			2.33								704.74 to 705.00 } low grade,
709											lt brn to buff, f. lam, mod. efferv.
710			0.21								Oil shale, med grade, tan to dk
711	-70										brn to dk gray lamina - lighter
712											color zones, more highly efferv. than
713											dk. Higher grade zones are
714											Mehegan to blk.
715											2.4
716			6.36								3.56
717											Tuff ss { 70 8.61-8.64
718			8.25								dk gray to { 70 9.85-9.87
719			9.25								710 .31-710.58
720			0.60								712.33-2.36
721	800		0.64								715.45 to 717.4 - lt gray to tan
722			1.08								to lt. brn oil shale, med
723			1.75								grade, mod efferv.
724			2.05								Oil shale (720.6-723.86) - lt. gray to
725			2.77								buff colored zone, low grade,
726			3.56								med. lam., mod. calc., feel of
727			4.25								mudstone
728			5.78								3.86
729											4.77
730											5.35
731											6.90
732											Tuff ss - 725.67-726.0, lt. brn
733											to gray, hycarb., many
734											contacts & bedding
735											Oil shale, lt brn, lt. gray, & buff lamina
736											low grade, mod calc., med. lam.
737											
738											
739											

COMMENTS:

HOLE NO: X-2 SHEET 7 OF DATE: 12/5/74 LOGGED BY: G.J. Hanson COLLAR: TD:

[illegible]

COMMENTS: