

PROJECT: White River Shale Project

Gentzler &

[illegible]

COMMENTS:

DEPTH	NE	FRX	PP	GAL/TON	CORE REC.	LITH.	DESCRIPTION
510					510.10		OIL SHALE, dark calcareous
511			42				OIL SHALE, dark calcareous
512			22				OIL SHALE, dark calcareous
513			30				OIL SHALE, dark calcareous
514			68.72				514.40-514.52 SANDSTONE bed, non-uniform
515			70				515.70-515.73 SANDSTONE
516							OIL SHALE, dark calcareous
517			40				
518			25.75				
519			88				OIL SHALE, light calcareous
520							OIL SHALE, dark
521							OIL SHALE, dark
522			61				SANDSTONE with dark OIL SHALE beds
523							SANDSTONE, calcareous, with light-colored OIL SHALE
524							SANDSTONE, calcareous, with light colored OIL SHALE
525							SANDSTONE, calcareous, with light colored OIL SHALE
526			68				SANDSTONE, calcareous, with light colored OIL SHALE
527							SANDSTONE, calcareous with dark colored OIL SHALE
528							SANDSTONE, calcareous with light colored OIL SHALE; 528.1
529							SANDSTONE, calcareous with light colored OIL SHALE
530			89.07				SANDSTONE, calcareous with light colored OIL SHALE
531							SANDSTONE, calcareous with light colored OIL SHALE
532			46				
533							
534							
535			42.49				SILTSTONE, calcareous with dark OIL SHALE bands
536							SILTSTONE, calcareous with dark OIL SHALE bands
537			20				SILTSTONE, calcareous with dark OIL SHALE bands
538			50				SILTSTONE, calcareous with dark OIL SHALE bands
539			73				SILTSTONE, calcareous with light OIL SHALE bands (in fi
540			63		540.70		SILTSTONE, calcareous with light OIL SHALE bands
541							
542							
543			12				OIL SHALE, cream to medium brown, low to medium grade w
544							some SANDSTONE layers, oil saturated
545							
546							
547			24.31				
548			51				
549							549.25-549.36. SANDSTONE layer oil saturated
550							

Drilled 30.60 Ft.
Recovered 30.58 Ft.

COMMENTS:

THE CLEVELAND-CLIFFS IRON CO.

PROJECT: White River Shale Project

Moulton &

HOLE NO. X-6

SHEET 2 OF 7

DATE: 1/14/75

LOGGED BY: Starbuck T.D. 605.

DEPTH	+MM	FRX	PP	GAL/TON	CORE REC.	LITH.	DESCRIPTION
550			57				OIL SHALE, low grade
551	+130			7.7			
552				6.7			
553				7.6			
554				13.4			
555				10.0			
556			40	9.7			
557				10.9			557.00-557.20, SANDSTONE lens, oil saturated
558				9.5			
559				10.4			
560				11.9			
561	+120			32.7			
562			29	14.5			562.25-562.35 SANDSTONE layer, oil saturated
563				9.7			
564				5.7			
565				1.4			
566			37	5.6			
567			37	13.0			
568				21.3			
569				10.6			
570			70	11.1			570.85-571.03 SAND layer with contorted silt lenses
571	+110		03.98	9.8	571.06		571.73-571.84 SANDSTONE, discontinuous zone
572		90°	45	10.9			
573		00	31	14.3			573.31-573.35 SANDSTONE coarse layer
574			05	15.9			573.65-574.00, SAND-SILT bed with vertical healed fracture
575			03.81	11.7			
576		02	57	9.7			OIL SHALE medium grade
577		90°	10.48	13.7			577.02-577.48 SANDSTONE layer, coarse grained, oil saturated
578		48	46	8.6			
579			48	8.6			OIL SHALE, medium-dark brown; silty; moderate to very
580			15.44	10.1			calcareous; numerous scattered CaCO ₃ pisolites;
581	+100		35.59	13.0			occasional PYRITE & HEMATITE; much BIOTITE
582			11.47	15.4			582.20-582.51 SANDSTONE, tuffaceous, oil impregnated with
583			58	11.1			several contorted SHALE layers; 583.23-583.28, same as above
584			28.81	11.0			
585			44.92	11.2			
586			42	10.3			
587			89	12.4			
588			46	10.9			
589			12.90	11.0			Parting plane coated with BIOTITE & SIDERITE (?)
590			71	12.1			590.02-590.21 SANDSTONE, tuffaceous; altered, oil saturated
591	+90		96	15.2			591.48-591.91 " " " "
592		.3	73	10.3			
593		90°	66	12.4			
594		.6	65	13.0			
595			50	10.3			
596			08	9.1			
597			17	14.7			
598		80	02	14.5			
599		.90	95	9.9			599.95-600.00 SANDSTONE, tuffaceous with GILSONITE blch

Drilled 30.36 Ft.
Recovered 30.36 Ft.Drilled 31.44 Ft.
Recovered 30.40 Ft. *

COMMENTS: * Ground up 1.04 Ft. at bottom of run.

THE CLEVELAND-CLIFFS IRON CO.

PROJECT: White River Shale Project

HOLE NO. X-6 SHEET 3 OF 7 DATE: 1/15/75 LOGGED BY: Gentzler T.D. 805.0

DEPTH	+MM	FRX	PP	GAL/TON	CORE REC.	LITH.	DESCRIPTION
600				.87			
601	+80						601.46-602.50 Lost Core
602				7.4			
603				10.2	602.50		
604				8.7			
605				16.4			
606			10	6.4			605.90-608.03 UPPER WAVY BED, SANDSTONE, tuffaceous;
607				5.1			highly altered & contorted; slightly calcareous
608			03.77	10.1			
609				11.5			
610				12.5			
611	+70			16.0			OIL SHALE, light to dark brown, thinly laminated; low to
612			.95	16.1			medium grade
613				17.9			
614				15.6			
615				10.3			
616				9.2			
617				6.9			MARLSTONE - OIL SHALE, low grade
618			.07	8.6			
619				12.7			
620		.55		13.1			
621	+60	90°		7.0			
622		84		7.4			
623				8.9			
624			.43	5.2			MARLSTONE - OIL SHALE, very low grade; buff-medium gray;
625				7.9			lightly banded, fine grained, finely laminated;
626				14.6			calcareous; hard, competent
627			.13	13.0			
628			.66	7.6	628.66		
629			.33	9.1			OIL SHALE, cream to light brown with zones of black;
630				17.1	LOST		low grade with small zones of medium to high grade
631	+50			12.5	CORE*		
632			.30	9.8	4.34	633.00	
633				8.2			
634			.20	10.0			
635				27.4			
636				29.1			OIL SHALE, richer zone
637			.11	10.2			
638				11.9			
639			.62	13.9			
640			.58	13.5			
641	+40		.30	13.2			
642				24.9			
643				26.3			OIL SHALE, richer zone
644			.57	13.3			
645			.38	15.4			
646				37.4			OIL SHALE, richer zone
647			.50	13.4			
648			.75	6.2			
649			38.59	5.0			

Drilled 30.50 Ft.
Recovered 26.16 Ft.Drilled 30.74 Ft. **
Recovered ?

COMMENTS: * Presumed left on the bottom - was recovered on the next run.

** The 30.47 Ft. interval includes 4.34 ft. of recording of material left in the bottom of the hole from the previous run.

DEPTH +ME	FRX	PP	CAL/ TON	CORE REC.	LITH.	DESCRIPTION
650		74	5.0			SILTSTONE - MARLSTONE buff-light gray; hard; numerous
651	+30	63	2.5			parting planes
652		25	8.0			
653		67	4.0			
654			4.6			
655		10	2.7			MARLSTONE, light gray, hard; calcareous
656			1.5			
657		72	2.6			
658		85	2.5			Bottom 'A' Groove
659		17.50	9.8	659.40		OIL SHALE, light brown, low grade
660		68	15.4			
661	+20	82	19.2			661.82-661.90 SANDSTONE, oil saturated
662			31.4			
663		48.66	17.2			
664		98.24	15.9			OIL SHALE, brown-black, medium to high grade; thinly laminated
665		19	13.7			
666		06	13.9			SANDSTONE, layers, oil saturated
667		10.80	21.9			2
668			31.7			
669		25	26.2			OIL SHALE, dark brown to black, high grade
670			26.4			
671	+10	75	42.7			
672			38.3			
673		12	25.0			
674			19.7			OIL SHALE, brown, low to medium grade
675		33	16.7			
676			11.5			
677			20.7			
678		40	19.0			
679			14.3			
680		13.85	10.1			
681	0	25	13.5			681.54-681.90 MAHOGANY MARKER, SANDSTONE, tuffaceous, w
682		64	11.8			interbedded shale, brown-gray; uneven contacts & cont
683			9.4			bedding - especially at the top some interbedded sha
684		73	12.7			
685			14.6			
686		20	32.6			SANDSTONE, layer, oil saturated
687			27.1			
688	90°	05	36.7			OIL SHALE, dark brown, high grade
689		42.70	18.7			OIL SHALE, light to medium brown (dark brown-black in o
690		13.35	20.8	689.90		rich zones); silty finely laminated, very calcareous
691	-10		32.1			(medium-high grade zones;) occasional thin lamination
692		56	26.0			or pods of HEMATITE-PYRITE; thin tuffaceous SANDSTONE
693		62	38.1			layers "MAHOGANY ZONE"
694		34.94	35.9			
695		21	71.1			
696		15.26	82.8			
697		47	68.8			
698			42.1			
699		53.18	49.7			

Drilled 30.50 Ft.
Recovered ?

COMMENTS:

DEPTH	SEC	FRX	PP	GAL/TON	CORE REC.	LITH.	DESCRIPTION
700				30.8			700.20-700.25 SANDSTONE, tuffaceous; thin layers
701	-20		.81	18.7			OIL SHALE, dark brown-black; medium to high grade; thin
702				25.8			laminated
703				39.1			
704				30.4			
705			.38	16.2			
706			.37	19.0			
707				36.7			OIL SHALE, dark brown-black, high grade
708			.97	46.9			
709				41.4			SANDSTONE, tuffaceous; thin (less than 0.5') irregular
710			.09	32.2			layers
711	-30		.22	19.7			
712				27.1			
713			.96	35.3			
714				17.4			OIL SHALE, brown; medium grade
715			.80	16.1			
716			.40	21.0			
717				28.0			
718			.80	35.8			
719				15.1			
720			.04	9.2			OIL SHALE, cream colored to medium brown, low to medium
721	-40		.14	13.0			with SANDSTONE occurring as a few thin layers with
722			.11	12.2			inclusions of SULFIDE minerals
723				30.8			
724				35.5			
725			.27	33.5			
726				24.8			OIL SHALE, brown, medium grade
727				23.1			
728				23.8			
729				32.6			
730			.94	21.4			
731	-50		.49	20.1			
732				13.3			OIL SHALE, buff to light brown; low grade
733			.92	10.3			
734				13.6			
735				13.8			
736			.57	23.6			
737				9.3			
738			.68	9.9			
739			.63	7.1			
740			.29	4.7			
741	-60			7.2			
742			.35	19.8			
743				7.7			743.92-744.20 SANDSTONE, tuffaceous; oil saturated
744			.55	6.6			
745				21.7			
746				28.3			
747				10.1			
748			.38	7.1			OIL SHALE, light brown, low grade
749			.19	14.4			OIL SHALE, higher grade zone

Drilled 30.50 Ft.
Recovered 30.47 Ft.

720.40

Drilled 30.50 Ft.
Recovered 30.22 Ft.

COMMENTS:

THE CLEVELAND-CLIFFS IRON CO.

PROJECT: White River Shale Project

HOLE NO. X-6 SHEET 6 OF 7 DATE: 1/16/75 LOGGED BY: Moulton T.D. 805.

DEPTH	+ -FEET	FRX	PP	GAL/ TON	CORE REC.	LITH.	DESCRIPTION
750			.56	39.9	750.90		OIL SHALE, brown to black; higher grade zone
751	-70			13.5			
752			.02.25	6.4			OIL SHALE, light brown to black; low to medium grade with
753			.50.78	2.7			zones of high grade; interbedded SANDSTONE & some
754			.88.53	5.3			SILTSTONE
755			.18.54	4.2			
756			.03.29	20.1			
757			.70.98	18.8			OIL SHALE, higher grade zone, interbedded with SAND
758			.19.30	6.3			layers; some dead oil present
759			.15	15.8			
760				15.0			
761	-80		.00.60	8.7			Top of 'B' Groove
762			.07.50	6.8			OIL SHALE, low grade
763			.04.30	3.1			
764				4.8			OIL SHALE, light brown, low grade
765			.43	7.2			
766			.26.50	5.4			
767			.44	7.9			
768				6.0			
769			.17	5.2			
770				8.9			
771	-90		.35	9.3			
772				3.9			
773			.51	5.6			
774			.73	7.4			
775			.84	11.0			775.60-778.00, SANDSTONE, oil saturated
776				10.0			
777				11.2			
778			.00.95	11.2			
779				8.8			OIL SHALE, light brown, low grade
780				10.1			
781	-100			9.0	781.10		
782			.78	8.6			OIL SHALE, light to medium brown, medium grade; some
783				6.6			thin SANDY layers (oil saturated) present
784			.83	4.0			
785			.26.33	8.1			
786			.43.65	7.0			
787			.23	5.9			SANDSTONE, thin layer; oil saturated
788				2.7			MARLSTONE, light gray, hard; calcareous
789			.95	5.1			OIL SHALE, light brown, low grade
790				7.1			
791	-110		.79	5.1			
792			.18	7.3			
793			.20.83	3.5			
794				2.3			MARLSTONE, light gray, hard; calcareous
795				4.0			
796			.51	5.3			
797			.89	6.0			
798				1.3			
799			.44	1.6			

Drilled 30.20 Ft.
Recovered 30.20 Ft.

COMMENTS:

PROJECT: White River Shale Project

[illegible]

COMMENTS: