

HOLE NO. X-3 SHEET 1 OF 6 DATE: 1/17/75 LOGGED BY: Starbuck T.D. 591.10

DEPTH	+ME	FRX	PP	GAL/TON	CORE REC.	LITH.	DESCRIPTION
320							OIL SHALE, calcareous, low grade
321			49.83				
322			35				
323							
324							OIL SHALE, calcareous, higher grade
325			39				OIL SHALE, calcareous, low grade
326			05.66				
327			82				
328							
329			25.89				OIL SHALE, calcareous, higher grade
330							OIL SHALE, calcareous, low grade
331							
332			00				
333							
334			16				334.16-334.22, SANDSTONE, tuffaceous; dark colored
335			81				335-344, OIL SHALE, calcareous, low grade
336							
337		85°					
338		I.30					
339	+130	I.65	.84	7.5			
340				6.7			
341			.09	6.6			
342			12	8.0			
343			62	12.2			
344			72	11.9			OIL SHALE, medium to higher grade
345				12.8			345.24-345.45, SANDSTONE, tuffaceous; oil saturated
346			24.94	9.5			OIL SHALE, calcareous; medium grade
347			10.91	10.9			
348			75	11.2			
349	+120			28.5			
350			15	19.4			350.40-350.48, SANDSTONE, tuffaceous; oil saturated
351				9.4			OIL SHALE, calcareous; low grade
352				8.6	351.90		
353			20.90	2.0			
354			83	2.8			
355			78	9.0			
356			80	24.2			
357				12.2			
358			29	10.8			358.29-358.45 SANDSTONE, tuffaceous
359	+110		39	9.2			
360			78	10.8			360.10-360.18 SANDSTONE, tuffaceous, oily
361			65	14.2			
362			20	16.5			362.05-362.35 SANDSTONE, tuffaceous; calcareous
363			83	11.6			363.42-363.46 SANDSTONE, tuffaceous; oily
364				9.7			
365			40.64	9.0			365.42-365.47 SANDSTONE, tuffaceous; oily
366			59	8.8			
367				8.2			
368			94	9.4			
369	+100		70	11.8			

COMMENTS:

THE CLEVELAND-CLIFFS IRON CO.

PROJECT: White River Shale ProjectHOLE NO. X-3 SHEET 2 OF 6 DATE: 1/18/75 LOGGED BY: Starbuck & Gentzler T.D. 591.10

DEPTH	+MM	FRX	PP	GALE LOG	CORE REC.	LITH.	DESCRIPTION
370			86	12.2			
371				19.2			371.45-371.94 SANDSTONE, tuffaceous, wavy
372				10.9			
373				11.4			
374			00	10.7			
375			98	10.9			375-378 OIL SHALE, gray-brown, very finely laminated, hard
376				11.9			competent; several thin, irregular & sometimes intermittent
377			19	11.9			inclusions of tuffaceous SANDSTONE, gray
378			68	11.2			
379	+90			10.8			
380			44	12.6			380.20-380.60 SANDSTONE, tuffaceous; dark gray-brown;
381			40	10.4			uneven contacts (interfingered with SHALE at the top &
382			18	11.3			undulating at the bottom); saturated with hydrocarbons
383			14	13.0	382.40		SHALE, light-medium brown, silty; moderately to very
384			15	11.0			calcareous, very hard, containing thin altered SANDSTONE
385			97	8.9			tuffaceous (generally oil impregnated); very hard-thin
386			92	16.5			laminated
387				14.3			
388			77	9.9			
389	+80			8.6			
390			01.98	4.0			
391				8.3			
392				16.2			
393				13.8			
394				10.3			
395			27.32	9.9			
396			56	9.4			
397			67	9.4			
398			96	17.9			
399	+70		28.51	7.3			399.00-400.60 UPPER WAVY BED, light colored, contorted,
400			32.60	8.9			oil impregnated; contains minor GILSONITE
401			34	11.3			
402			60	11.9			
403			09.72	13.5			
404			77	15.3			
405				15.5			
406			46	21.4			
407				12.6			
408			00	10.6			
409	+60		61	8.4			
410				7.0			
411			69	10.2			
412				13.6	412.36		SILTSTONE-MARLSTONE, light-medium brown, thinly laminated
413		.70	57.70	10.5			banded; slightly dipping bedding with some micro faulting
414		87°		6.2			hard; moderate to very calcareous; occasional layers of
415		30		8.1			PYRITE-HEMATITE; a few zones of low grade oil enrichment
416			15	8.2			
417			33	4.7			
418				11.1			
419	+50		.	16.1			

Drilled 29.96 Ft.
Recovered 30.26 Ft.

COMMENTS:

THE CLEVELAND-CLIFFS IRON CO.

PROJECT: White River Shale ProjectHOLE NO. X-3 SHEET 3 OF 6 DATE: 1/18/75 LOGGED BY: Gentzler T.D. 591.10

DEPTH	+MM	FRX	PP	GAL/TON	CORE REC.	LITH.	DESCRIPTION
420				11.4			
421			.33	8.5			
422			.85	8.9			
423				14.5			
424			.26	36.4			
425				16.1			
426			.61	12.1			
427				11.5			
428			.92	13.8			
429	+40		.86	13.1			
430				14.1			
431				35.7			
432				15.4			
433			.58	14.9			
434				18.7			
435			.53	31.4			
436			.95	9.0			
437			.67	5.7			
438			.33.65	5.0			
439	+30		.07.62	3.3			
440			.25.78	3.2			Small vugs (0.02'-0.05' diameter) filled with earthy material
441			.48.83	7.8			
442			.66.88	4.6			
443			.65	4.4			OIL SHALE, cream-dark brown (low to medium to high grade)
444			.07.63	6.6			SANDSTONE, tuffaceous, black; oil saturated inclusions
445				1.8			
446			.91	1.6			
447			.35	2.9			
448			.23.88	7.4			
449	+20			17.3			OIL SHALE, dark brown-black, higher grade
450			.12	40.6			
451				18.0			
452			.21.93	15.9			OIL SHALE, medium grade
453			.40.67	17.8			
454			.62.94	10.0			
455			.17	17.5			455.00-457.00 interbedded SANDSTONE & SHALES, predominant SANDSTONES; some zones oil saturated
456				24.7			
457			.56	31.8			
458				20.4			
459	+10			36.4			
460			.94	35.7			OIL SHALE, medium grade
461				32.1			
462			.08	20.7			
463				17.3			
464			.20	11.4			
465				17.2			OIL SHALE, low to medium grade
466			.72	18.8			
467				9.6			
468			.74	13.7			
469	0			10.3			469.52-469.92, MAHOGANY MARKER, SANDSTONE, tuffaceous; oil saturated

Drilled 29.74 Ft.
Recovered 30.05 Ft.

442.10

Drilled 30.80 Ft.
Recovered 30.48 Ft.

COMMENTS:

DEPTH	+ME	FRX	PP	GAL/TON	CORE REC.	LITH.	DESCRIPTION
470				12.4			
471				8.9			
472				13.4	472.58		
473			18.37	26.2			OIL SHALE, brown to black, medium to high grade (MAHOGANY
474			10.43	43.4			ZONE included in this run - to 504')
475			88	31.3			
476				19.8			
477			61.99	21.5			
478			13.25	14.7			
479	-10			34.4			
480				33.0			
481			83	32.6			
482			34.40	48.8			
483			71.62	76.2			
484			89	72.3			
485			22	51.5			
486			24.92	36.0			
487			42	56.2			
488			76	37.0			
489	-20		55	20.1			
490				17.9			
491				36.1			
492				32.8			
493				17.4			
494			50.82	17.2			
495				24.3			
496				54.5			
497			03.10	40.4			497.62-497.72, SANDSTONE, tuffaceous
498			40	44.7			
499	-30		94	30.8			
500				19.6			OIL SHALE, medium to high grade
501				29.2			
502				35.9			OIL SHALE, medium to high grade: calcareous
503			57	15.3			
504			97	18.7	504.10		
505			20	14.4			
506			34	17.4			
507				30.0			
508			38	31.8			508.38-508.41 SANDSTONE, tuffaceous
509	-40		78	14.1			OIL SHALE, medium grade
510			10.85	8.2			
511			13	12.4			
512			10	15.5			
513			15	32.3			
514				36.3			
515				31.4			
516				24.7			
517			23	23.4			
518				26.4			
519	-50		.	32.4			

Drilled 31.20 Ft.
Recovered 30.40 Ft.

Drilled 30.50 Ft.
Recovered 30.40 Ft.

COMMENTS:

DEPTH	+ME	FRX	PP	GAL/TON	CORE REC.	LITH.	DESCRIPTION
520				21.7			
521			12	20.3			
522			21	12.6			OIL SHALE, calcareous, medium grade
523		90°	73	11.4			
524			30	14.8			
525			24	20.4			
526			26.53	20.0			
527			60	10.1			OIL SHALE, calcareous, low grade
528			10.53	11.6			528.58-528.67 SANDSTONE, tuffaceous
529	-60		36.53	6.3			
530			37.65	3.2			
531			25	10.6			
532			00	19.3			
533			09.53	8.5			533.53-533.97 SANDSTONE, tuffaceous with oily bands
534			30.92	8.6			SILTSTONE-MARLSTONE, very light - medium brown, occasional
535			46	26.8			gray; thinly laminated hard; moderate to very calcareous
536				25.8			some low grade oil enrichment
537			70	9.7			
538				6.0			
539	-70		15	15.6			
540			81	46.4			
541				16.3			
542				7.0			
543			09.29	3.3			
544			73.91	4.4			
545			26.57	4.8			
546			69.81	20.7			
547			48.85	21.9			546.72-547.55 SANDSTONE, tuffaceous, coarse grained, oil
548			30.55	14.3			saturated, with GILSONITE; contains MARLSTONE lenses
549	-80		11.80	19.9			548.38-550.00, SANDSTONE, tuffaceous; coarse-grained;
550			09.52	15.6			altered; boozing tar
551			76	8.8			
552				6.9			
553			09	3.2			553.37-553.40 tiny calcareous aggregates in SHALE
554	85°		73	6.7			
555			39	7.3			
556			52	4.7			
557			39	5.2			
558			56	7.8			
559	-90		34	4.8			
560	85°		72	9.1			
561			76	8.7			
562				5.2			
563				4.0			
564			78.89	4.2			
565				7.8			
566			29	7.0			566.12-566.29 SANDSTONE, tuffaceous; oil saturated slight
567				7.7			distorted bed; bed offset 0.03' along healed 55° fractur
568				7.6			
569	-100		82	5.1			

Drilled 30.50 Ft.
Recovered 30.50 Ft.

534.60
565.10

COMMENTS:

DEPTH	+ MIN	FRX	PP	GAL/TON	CORE REC.	LITH.	DESCRIPTION
570		45°		2.2			LIMESTONE, light gray-brown, medium grained, thinly laminated; dolomitic in zones; low grade oil in zones & containing occasional oil bearing tuffaceous SANDSTONE layers; also pods & inclusions of PYRITE-HEMATITE & occasional vugs of earthy calcareous material
571		45°		3.8			
572		45°	17	4.3			
573			08	3.1			
574				2.5			
575				5.0			
576			00.73	3.3			
577			00.57	5.3			576.98-577.10 & 577.33-577.57 SANDSTONE, tuffaceous; also oil-stained
578	90°	1:72	57.72	1.6			
579	-110			0.9			
580			41	1.8			
581				1.4			581.92-582.00 Intraformational BRECCIA; vugs of earthy calcareous material; thin laminations of PYRITE-HEMATITE
582				1.9			
583			25	2.0			
584			65	2.0			
585		51°	05.93	2.8			
586			60.82	1.6			
587		88°	90.96	1.9			587.90-587.96 Massive PYRITE-HEMATITE layer: tar-coated vertical fracture
588							
589	-120		90.94				
590			74				
591							
					591.10		

COMMENTS: