

U059

19-105-25E

Uintah County, UT

P-4 CORE LOG

HOLE: P-4

[illegible]

Depth	±MM	FRX	PP	0	Gal/ 50 Ton	Lith	Rock Description
454					6.5		Oil Shale - low to medium grade,
455			.05		6.5		buff to brown, thinly laminated
456					5.8		
457					5.8		
458			.15		13.5		
459					13.5		
460					8.7		
461					8.7		
462			.60		6.8		
463	+240				6.8		
464					8.7		
465					8.7		
466					8.6		
467			.90		8.6		
468					5.0		
469					5.0		
470					7.3		
471					7.3		
472					8.7		
473	+230				8.7		
474					13.7		Oil Shale - medium grade, brown
475					13.7		
476					6.8		
477					6.8		
478			.17		7.0		
479					7.0		
480					9.0		
481					9.0		
482			.80		11.6		482.58-.82 Sandstone layer.
483	+220				11.6		oil saturated
484					8.2		
485					8.2		Oil Shale - low to medium grade,
486					14.2		buff to brown, thinly laminated
487					14.2		
488					10.8		
489			.89		10.8		
490					6.9		
491			.00.75		6.9		
492					8.4		
493	+210				8.4		
494					14.4		
495					14.4		
496					8.5		
497					8.5		
498					11.5		Oil Shale - medium grade, brown,
499					11.5		thinly laminated
500					14.4		
501			.60		14.4		
502					10.0		
503	+200				10.0		

WHITE RIVER SHALE PROJECT

HOLE: P-4

Depth	FRX	PP	0	Gal/ 50 Ton	Lith	Rock Description
504				11.7		Oil Shale - medium grade,
505		.20		11.7		light brown to brown,
506		.10		13.1		thinly laminated
507				13.1		
508				14.1		
509				14.1		
510				12.8		
511				12.8		
512				11.8		
513	+190	.00.60		11.8		
514				13.3		
515		.50		13.3		
516				12.7		
517		.50		12.7		
518		.70		11.7		
519		.70		11.7		
520				12.3		
521				12.3		
522		.50		11.7		
523	+180	.00.60		11.7		523.00-.60 Sandstone layer
524				12.3		
525		.70		12.3		Oil Shale - medium grade,
526		.30		15.4		light brown to brown,
527				15.4		thinly laminated
528				19.1		
529				19.1		
530				19.9		
531				19.9		
532				18.7		
533	+170			18.7		
534				11.6		
535				11.6		
536		.10		10.6		
537				10.6		
538				9.5		
539				9.5		
540				8.6		
541		.74		8.6		
542				18.3		
543	+160	.68		18.3		
544				8.4		Oil Shale - low grade,
545				8.4		buff to brown, thinly laminated
546				9.5		
547				9.5		
548		.50		10.2		
549				10.2		
550				6.0		
551				6.0		
552				7.5		
553	+150			7.5		

Depth	±MM	FRX	PP	O	Gal/ 50 Ton	Lith	Rock Description
554			.10		13.7		Oil Shale - low to medium,
555					13.7		buff to brown, thinly laminated
556					9.2		
557					9.2		
558					8.7		
559					8.7		
560			.70		15.7		
561					15.7		
562					7.3		
563	-140				7.3		
564					6.7		
565					6.7		
566					6.0		
567					6.0		
568					19.4		
569					19.4		
570			.70		8.8		
571					8.8		
572					8.4		
573	+130		.15		11.1		
574					14.2		Oil Shale - low to medium grade,
575					35.8		light to dark brown,
576					10.3		thinly laminated
577					7.5		
578					7.3		
579					6.1		
580					3.3		
581					10.3		
582					13.5		
583	+120		.60		11.6		583.6-.8 Sandstone layer
584					9.5		
585					9.8		
586					11.5		
587					17.9		Oil Shale - low to medium grade,
588					24.6		brown, thinly laminated
589					9.9		
590			.80		6.8		
591					2.0		Marlstone - light gray, hard
592					5.3		
593	+110		.40		12.3		Oil Shale - medium grade,
594					18.4		light brown
595					10.2		
596			.90		9.6		
597			.70		8.9		
598					10.8		
599			.10		14.3		599.30-.70 Sandstone layer
600					13.5		
601					11.7		
602					10.3		602.80-603.15 Sandstone layer,
603	+100				10.4		oil saturated

Depth	±MM	FRX	PP	0	Gal/ 50 Ton	Lith	Rock Description
604					8.9		Oil Shale - low to medium grade,
605					8.8		light brown, silty
606					10.8		
607					5.6		
608			.90		12.0		608.20-.70 Sandstone layer,
609					11.5		oil saturated
610					11.1		Oil Shale - low to medium grade,
611					11.1		silty, uniform
612					10.0		
613	+90				12.0		
614					11.0		
615					11.1		
616					12.0		616.00-.30 Sandstone layer,
617					13.7		oil saturated
618					10.0		617.40-.80 Sandstone layer,
619					12.7		oil saturated
620					12.3		Oil Shale - low grade,
621					9.5		light brown, silty
622					9.2		
623	+80				15.5		
624					12.6		Oil Shale - low to medium grade,
625			.60		8.8		light to dark brown,
626					7.9		thinly laminated
627					4.3		
628					9.5		
629			.10		15.1		
630					11.6		
631			.85		9.9		
632					9.7		
633	+70				8.7		
634					13.5		634.25-.80 Sandstone layer,
635			.00		5.9		oil saturated
636			.60.80		5.4		634.80-637.70 Upper Wavy Bed
637			.15.45		7.2		Sandstone layer interbedded with
638			.00		11.1		shale, highly contorted
639			.28		11.7		
640					14.2		
641			.29		15.3		
642					17.1		
643	+60		.37		14.0		
644			.90		10.2		
645			.26		8.5		Oil Shale - predominantly medium
646			.80		7.1		grade, brown to dark brown,
647					11.0		thinly laminated
648					13.1		
649					9.0		
650					6.5		
651					8.2		
652					7.1		
653	+50				5.6		

Depth ±MM	FRX	PP	0	Gal/ 50 Ton	Lith	Rock Description
654				15.1		Oil Shale - low to medium grade,
655				13.4		buff to brown
656				9.2		
657				10.1		
658				11.7		
659				35.0		Oil Shale - high grade, black
660				13.3		Oil Shale - medium grade,
661				12.6		brown with thin dark brown bands
662				12.2		
663	+40	.50		13.4		
664				13.3		
665				24.0		
666				24.0		
667				13.3		
668		.00		19.1		
669		.00		28.7		Oil Shale - high grade, dark brown
670				7.4		
671		.10.90		5.0		
672		.46.60		3.5		
673	+30	.80		3.5		
674				4.1		Oil Shale - predominantly medium
675		.40.80		7.4		grade, brown to dark brown,
676		.20.70		3.9		thinly laminated
677				4.3		
678				2.2	TIT	Marlstone - light gray, hard
679				1.6	TIT	
680				1.9	TIT	Bottom 'A' Groove
681				8.2		
682				17.5		Oil Shale - low to medium grade,
683	+20	.10		11.5		brown, uniform, silty
684		.10.90		11.9		
685				29.4		Oil Shale - high grade, dark brown
686				15.6		
687		.80		14.9		
688				15.3		Oil Shale - medium to high grade,
689		.30		24.4		brown with dark brown bands
690				30.6		
691		.40		23.9		
692		.55		24.0		
693	+10			44.0		Oil Shale - high grade, dark brown
694		.00.50		38.9		
695				22.6		
696				17.3		
697				11.8		
698		.20		13.9		
699				20.0		
700				12.3		
701		.80		12.4		
702		.20		13.3		702.60-703.05 Mahogany Marker
703	0			13.6		Sandstone layer

WHITE RIVER SHALE PROJECT

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Depth	±MM	FRX	PP	0	50	Gal/ Ton	Lith	Rock Description
704			.30			11.7		Sandstone layer with interbedded
705						10.3		shale sand zones, oil saturated,
706						16.3		Oil Shale - medium grade,
707			.30			16.4		light brown, thinly laminated
708						47.7		Oil Shale - high grade, black
709			.40			47.2		
710			.50			23.4		
711						21.5		Oil Shale - high grade
712			.40 .70 .80			20.8		'Mahogany Zone' dark brown to black
713	-10		.70			13.6		
714						26.7		
715			.80			32.9		
716			.50			62.2		
717			.40			76.4		
718						66.3		
719						44.9		
720			.20			51.2		
721			.40			35.9		721.84-.96 Sandstone layer,
722						36.0		oil saturated
723	-20					19.6		
724						29.3		Oil Shale - medium to high grade,
725						43.9		dark brown to black,
726						18.6		thinly laminated
727						16.5		
728						18.4		
729						41.3		
730						43.8		730.60-.70 Sandstone layer
731			.03 .15			43.0		
732						36.2		
733	-30					21.4		
734						25.8		734.20-.40 Sandstone layer,
735						25.3		oil saturated
736			.30			16.3		
737						16.2		
738						14.8		
739			.15			23.4		
740			.85			23.4		Oil Shale - medium to high grade,
741						17.3		brown to black
742						10.4		
743	-40		.00			12.6		
744						12.1		
745						32.7		Oil Shale - high grade,
746			.10 .90			31.9		dark brown to black,
747						30.3		thinly laminated
748			.30			21.7		
749			.70			25.6		Oil Shale - high grade,
750						34.8		dark brown to black
751			.90			21.3		
752						21.3		
753	-50		.40 .90			17.1		

Depth	FRX	PP	0	Gal/ 50 Ton	Lith	Rock Description
754		.60		13.4		
755		.20		9.8		
756				16.0		
757				25.5		Oil Shale - high grade, dark brown
758				9.8		
759		.20		9.1		
760		.60		6.2		
761		.10.80		6.2		
762				5.7		
763	-60			13.6		
764		.30.70		13.1		
765		.90		8.5		
766		.90		31.3		Oil Shale - high grade, black
767				19.2		
768				9.1		
769				8.0		
770				25.0		Oil Shale - high grade, dark
771				38.9		brown to black
772				6.8		
773	-70			5.8		
774		.63.68		3.7		
775		.00		4.2		
776		.20		15.6		
777		.40.78		19.2		777.05-.90 Sandstone layer
778		.09.60.81		14.2		oil saturated
779	80°			9.0		778.8-781.67 Sandstone layer,
780	80°			5.4		oil saturated
781	80°	.67		9.8		
782		.31		9.1		
783	-80	.81		6.4		Oil Shale- predominantly low grade,
784				5.7		light brown to brown,
785				5.7		thinly laminated
786				6.6		
787				6.2		
788				7.1		
789		.55		6.5		
790				8.6		
791				9.4		
792				4.2		
793	-90			2.7		Marlstone - light gray,
794		.58		6.0		
795		.65		10.5		Oil Shale - low grade,
796				10.2		light brown, silty
797		.45		11.9		
798				11.9		
799				9.7		
800				12.0		800.9-801.1 Sandstone layer,
801		.05		9.7		oil saturated
802				8.5		
803	-100			5.6		Oil Shale - low grade,

Depth	±MM	FRX	PP	0	Gal/ 50 Ton	Lith	Rock Description
804			.67		7.5		buff to grav. silty
805			.35		7.8		
806			.85		4.0		
807					2.1	TLT	Marlstone - light gray.
808					4.1		Oil Shale - low grade.
809					5.8		buff to gray. silty
810					4.9		
811					3.2		
812					2.8	TLT	Marlstone - light gray.
813	-110				5.7		Oil Shale - low grade.
814			.55		5.7		light brown, silty
815					8.1		
816			.69		4.1		
817					1.2	TLT	Marlstone - light gray
818			.28		6.7		Oil Shale - low to medium grade.
819			.40.85		4.5		medium to dark grav. silty
820			.32.82		3.6		
821			.60		9.2		
822					18.4		
823	-120				18.4		Oil Shale - medium grade.
824			.35		13.3		brown to dark brown.
825			.75		13.3		thinly laminated
826					24.6		
827					24.6		
828					18.7		
829			.60		18.7		
830			.65		9.5		
831			.80		9.5		
832			.53		11.0		
833	-130		.45		11.0		
834			.00.30.60		7.8		Oil Shale - low grade, buff.
835			.40.83		7.8		thinly laminated
836			.17		2.6	TLT	Marlstone - light gray, hard
837					2.6	TLT	
838					8.4		
839			.80		8.4		Oil Shale - low to medium grade.
840					10.8		brown to dark brown.
841			.60.70		10.8		thinly laminated
842					7.8		
843	-140				7.8		
844					14.5		
845			.15		14.5		
846			.80		8.5		
847					8.5		
848					19.0		
849			.30.80		19.0		
850			.55		11.0		
851			.15.65.90		11.0		
852					7.9		
853	-150				7.9		

WHITE RIVER SHALE PROJECT

HOLE: P-4

Depth	±MM	FRX	PP	O	Gal/ 50 Ton	Lith	Rock Description
854			.30.90		16.8		Oil Shale - low to medium grade,
855			.70.75		16.8		buff to brown
856			.70		8.3		
857			.40		8.3		
858			.50		24.5		
859			.30		24.5		
860					16.8		
861					16.8		
862					28.1		Oil Shale - high grade, dark brown
863	-160				28.1		
864			.20.45.85		4.9		Oil Shale - low to medium grade,
865					4.9		buff to dark brown,
866			.15.20		9.2		thinly laminated
867			.70		9.2		
868					16.6		
869					16.6		
870			.65.80.85		12.6		
871					12.6		
872					18.7		
873	-170				18.1		Oil Shale - medium grade, brown,
874					14.1		thinly laminated
875					14.1		
876					35.8		Oil Shale - high grade, black
877					35.8		
878					5.2		
879					5.2		Oil Shale - low to medium grade,
880			.90		3.2		buff to brown, thinly laminated
881					3.2		
882					5.2		
883	-180				5.2		
884			.17.50		13.9		
885					13.9		
886			.53		22.0		
887			.87		22.0		
888			.35.66.82		8.8		
889			.13.75		8.8		
890			.89		2.7	TLT	Marlstone - light gray, hard
891			.26.76		2.7	TLT	
892			.08.49.82		0.4	TLT	
893	-190		.21.52		0.4	TLT	
894					1.4	TLT	
895			.27		1.4	TLT	
896					0.4	TLT	
897					0.4	TLT	
898					0.0	TLT	
899					0.0	TLT	
900					2.8	TLT	
901					2.8	TLT	
902					1.8	TLT	
903	-200				1.8	TLT	

WHITE RIVER SHALE PROJECT

HOLE: P-4

Depth	±MM	FRX	PP	0	Gal/ 50 Ton	Lith	Rock Description
904					1.9	TLT	Marlstone - light gray, hard
905					1.9	TLT	
906					5.9		Oil Shale - low to medium grade,
907					5.9		buff to brown, thinly laminated
908					7.4		
909					7.4		
910					8.3		
911					8.3		
912					14.4		
913	-210				14.4		
914					18.2		
915					18.2		
916			.80.90		2.4	TLT	Marlstone - light gray, hard
917					2.4	TLT	
918			.50		13.9		
919					13.9		
920			.00		31.6		Oil Shale - high grade, dark brown
921			.90		31.6		
922			.30		10.4		
923	-220		.30.50		10.4		
924					4.8		Oil Shale - low grade, buff to
925					4.8		light brown, thinly laminated
926			.35.90		3.4		
927			.30.60		3.4		
928			.85		7.7		
929					7.7		
930			.00		4.7		
931			.60		4.7		
932					6.0		
933	-230		.10		6.0		
934			.00		5.1		
935			.80		5.1		
936					3.2		
937					3.2		
938					1.4	TLT	Marlstone - light gray, hard
939					1.4	TLT	
940					2.3	TLT	
941					2.3	TLT	
942					4.2		Oil Shale - low grade, buff
943	-240				4.2		
944					3.3		
945					3.3		
946					2.1	TLT	Marlstone - light gray, hard
947					2.1	TLT	
948					2.2	TLT	
949					2.2	TLT	
950					4.2		Oil Shale - low grade, buff
951					4.2		
952					2.8	TLT	Marlstone - light gray, hard
953	-250				2.8	TLT	

Depth	±MM	FRX	PP	O	Gal/ 50 Ton	Lith	Rock Description
954					0.0	TIT	Marlstone - light gray, hard
955					0.0	TIT	
956					12.2		Oil Shale - low to medium grade,
957					12.2		buff to brown, thinly laminated
958			.50		13.9		
959			.61		13.9		
960			.91		11.9		
961					11.9		
962			.16		8.1		
963	-260		.05		8.1		
964					6.1		
965			.59		6.1		
966			.57		5.8		
967			.45		5.8		
968			.55		6.3		
969			.67		6.3		
970			.52		3.4		
971			.00		3.4		
972					4.2		
973	-270		.83		4.2		Oil Shale - low to medium grade,
974					6.4		buff to brown, thinly laminated
975					6.4		
976					15.2		
977			.23		15.2		
978					15.7		
979			.90		15.7		
980					16.1		
981					16.1		
982			.40		14.4		
983	-280		.30.55		14.4		
984			.20		18.1		
985					18.1		
986			.50		14.3		
987					14.3		
988					5.5		
989			.86		5.5		
990			.25		0.5	TIT	Marlstone - light gray, hard
991					0.5	TIT	
992			.21		4.8		Oil Shale - low grade,
993	-290				4.8		buff, thinly laminated
994			.50.90		5.3		
995					5.2		
996			.00.32.65		2.5	TIT	Marlstone - light gray, hard
997			.89		2.5	TIT	
998					5.2		Oil Shale - low grade, buff to
999			.94		5.2		brown, thinly laminated
1000		I45	.12.77		7.5		
1001			.65		7.5		
1002					8.7		
1003	-300		.52		8.7		

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Depth	MM	FRX	PP	0	Gal/ 50 Ton	Lith	Rock Description
1004			.88		6.0		
1005					6.0		
1006			.00.58		1.9	TIT	Marlstone - light gray, hard
1007			.67		1.9	TIT	
1008			.80.96		7.6		Oil Shale - low grade, buff
1009			.48		7.6		to brown
1010			.52		4.1		
1011					4.1		
1012					0.2	TIT	Marlstone - light gray, hard
1013	-310				0.2	TIT	
1014					1.1	TIT	
1015					1.1	TIT	
1016					3.9		Oil Shale - low grade, buff
1017		I 60°	.85		3.9		
1018		I 40°	.28.43		4.7		
1019		I 35°			4.7		
1020			.62.80		2.7	TIT	Marlstone - light gray, hard
1021			.21		2.7	TIT	
1022					2.6	TIT	
1023	-320		.98		2.6	TIT	Marlstone - light gray, hard
1024					4.8		Oil Shale - low grade, buff
1025			.69.90		4.8		
1026			.77		1.0	TIT	Marlstone - light gray, hard
1027					1.0	TIT	
1028			.40		0.0	TIT	
1029					0.0	TIT	
1030					1.5	TIT	
1031			.60		1.5	TIT	
1032					5.0		Oil Shale - low grade, buff
1033	-330	45°	.45		5.0		
1034					4.2		
1035		45°			4.2		
1036					1.0	TIT	Marlstone - light gray, hard
1037			.25.82		1.0	TIT	
1038			.48		1.8	TIT	
1039					1.8	TIT	
1040			.55		3.9		Oil Shale - low grade, buff
1041					3.9		
1042			.80.85		2.7	TIT	Marlstone - light gray, hard
1043	-340				2.7	TIT	
1044			.21.46.50		0.7	TIT	
1045					0.7	TIT	
1046					0.1	TIT	
1047					0.1	TIT	
1048					5.2		Oil Shale - low grade, buff
1049					5.2		
1050			.30.55.57		4.7		
1051					4.7		
1052					2.6	TIT	Marlstone - light gray, hard
1053	-350				2.6	TIT	

Depth	±MM	FRX	PP	0	Gal/ 50 Ton	Lith	Rock Description
1054					6.6		Oil Shale - low grade, buff
1055					6.6		
1056					1.6	TIT	Marlstone - light gray, hard
1057					1.6	TIT	
1058					3.3		Oil Shale - low to medium grade,
1059					3.3		buff to brown, thinly laminated
1060					3.3		
1061			.17		3.3		
1062					11.3		
1063	-360				11.3		
1064			.08		5.0		
1065			.35.80		5.0		
1066					9.3		
1067					9.3		
1068			.18		10.6		
1069			.61		10.6		
1070			.16.37		1.5	TIT	Marlstone - light gray, hard
1071			.30.37		1.5	TIT	
1072					10.7		Oil Shale - medium grade, brown
1073	-370	30			10.7		Oil Shale - low to medium grade,
1074					10.1		buff to brown, thinly laminated
1075					10.1		
1076					10.5		
1077					10.5		
1078					18.5		
1079					18.5		
1080					12.3		
1081					12.3		
1082					8.3		
1083	-380				8.3		
1084					3.7		
1085					3.7		
1086					14.7		
1087					14.7		
1088					11.0		
1089					11.0		
1090					10.4		
1091					10.4		
1092					3.5		
1093	-390				3.5		
1094					7.3		
1095					7.3		
1096					10.6		
1097					10.6		
1098					7.2		
1099					7.2		
1100					18.5		Oil Shale - low to medium grade,
1101					18.5		buff to brown, thinly laminated
1102					17.4		
1103	-400				17.4		

Depth	±MM	FRX	PP	0	Gal/ 50 Ton	Lith	Rock Description
1104					9.3		Oil Shale - low to medium grade,
1105					9.3		buff to brown
1106					13.1		
1107					13.1		
1108					11.0		
1109					11.0		
1110					10.0		
1111					10.0		
1112					21.5		
1113	-410				21.5		
1114					9.7		
1115					9.7		
1116					12.4		
1117					12.4		
1118					2.4	TIT	Marlstone - light gray, hard
1119					2.4	TIT	
1120					2.7	TIT	
1121					2.7	TIT	
1122			.12.45		15.1		
1123	-420		.13.75.89		15.1		Oil Shale - low to medium grade,
1124			.25.55		3.7		buff to brown, thinly laminated
1125			.30.78.97		3.7		
1126			.35.44.70		5.7		
1127			.26		5.7		
1128					6.4		
1129			.07.28.80		6.4		
1130			.05		14.5		
1131					14.5		
1132					15.6		
1133	-430				15.6		
1134					10.3		
1135					10.3		
1136					15.3		
1137					15.3		
1138					8.9		
1139					8.9		
1140					7.1		
1141					7.1		
1142			.82		6.5		
1143	-440				6.5		
1144					6.3		
1145					6.3		
1146			.61		4.5		
1147					4.5		
1148			.84		2.9	TIT	Marlstone - light gray, hard
1149					2.9	TIT	
1150					2.2	TIT	
1151			.70.86		2.2	TIT	
1152			.98		2.8	TIT	
1153	-450				2.8	TIT	

[illegible]