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SHENANDOAH OIL CORPORATION

SOC # 1-CF & I

758.54' WEL-855.75' NSL

SE SE Sec. 20, T34S, R68W., 6th P.M.

LAS ANIMAS COUNTY, COLORADO

DVR	<input checked="" type="checkbox"/>
FJP	<input type="checkbox"/>
HHM	<input checked="" type="checkbox"/>
JAM	<input checked="" type="checkbox"/>
JJD	<input checked="" type="checkbox"/>
GCH	<input type="checkbox"/>
CGM	<input type="checkbox"/>

November 29, 1975

*Dean St. Clair*

Dean St. Clair  
Consulting Geologist.  
P.O.Box 2272  
Casper, Wyoming 82602

BEST IMAGE  
AVAILABLE

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# GENERAL INFORMATION SUMMARY

OPERATOR: Shenandoah Oil Corporation  
224 Republic Building  
1612 Tremont Place  
Denver, Colorado 80202

LEASE: SOC # 1 CF & I, 758.54' WEL-  
855.75' NSL, SE SE Sec. 20,  
T34S, R68W. 6th P.M.  
LAS ANIMAS COUNTY, COLORADO

ELEVATION: Ground: 7892' K.B. 7902'

CONTRACTOR: Coleman Drilling Company, Rig # 2  
Farmington, New Mexico  
Mr. Calvin Anderson, Tool Pusher

SPUD DATE: November 11, 1975

COMPLETION DATE: November 26, 1975

CASING: 8 5/8" surface to 206'.  
7 joints of 24# 8 5/8" casing,  
Cement with 160 sx type H with  
2% Calcium Chloride, 1/4 sx Flocele.

MUD PROGRAM: Baroid Mud, Farmington, New Mexico.

ENGINEERING: Mr. Bob Wilson, Shenandoah Oil.  
Mr. Carl Heibucher, Minerals  
Management, Casper, Wyoming.

LOGGING PROGRAM: IES-base surface pipe to T.D.  
Density-Neutron 205' to T.D.  
Comp-Density Log 205' to T.D.  
Frac-Finder Log 204' to T.D.

SAMPLE DISPOSITION: To American Stratigraphic Company  
Denver, Colorado.

MUD LOGGING: Geoservices, Denver, Colorado  
Manned by the geologist.

GEOLOGIST: Dean St. Clair, Casper, Wyoming.

WELL STATUS: Plugged

TOTAL DEPTH: Driller: 1558' Logger: 1558'



## CHRONOLOGICAL DRILLING SUMMARY

November 15, 1975	Spud
16	Ran pipe and cement.
17	Drilling out cement at 207'.
November 18	Drilling at 749'.
19	Waiting on test tool at 1156'.
20	Waiting on test tool at 1156'.
21	Drill stem test at 1100' to 1156'.
November 22	Drilling at 1349'.
23	Logging at 1558'.
24	Drill stem test # 2 at 1370' to 1430'.
25	Drill stem test # 3 at 609' to 700'.
November 26, 1975	Ran cement plug.

## REMARKS

The Niobrara Formation on this well is of particular interest for gas potential. Although the drill stem test did not show encouraging amounts of gas the chromatograph (gas detector) indicated a substantial increase in Methane (C<sub>1</sub>) and Ethane (C<sub>2</sub>) or dry gas from 650' to 740'.

Lithologic samples and electric logs show this zone to be highly fractured, indicating even more reason for a more critical look at the Niobrara Fm. on future drilling.

Thus with less than encouraging results from the drill stem test and the zone being this highly fractured the more probable way to drill future holes on the Tercio Anticline, to obtain full evaluation, would be by drilling with air.

# FORMATION LOG TOPS

Formation	Depth	Sub-Sea Datum
Fort Hays	764'	(+7138')
Codell Sand	835'	(+7067')
Green Horn	907'	(+6995')
Dakota	1236'	(+6666')
Morrison	1520'	(+6382')

## BIT RECORD

Bit #.	Size.	Make.	Type.	In.	Out.	Feet.	Hrs
1	12 1/4"	Smith	RT	0'	208'	208'	
2	7 7/8"	Smith	DTJ	208'	781'	573'	7 3/4
3	7 7/8"	Smith	DTTJ	781'	1341'	560'	19 3/4
4	7 7/8"	Smith	DTT	1341'	1558'	217'	11 1/4

## DEVIATION SURVEY'S

Depth	Deviation	Depth	Deviation
245'	3	1111'	11 1/2
372'	5 1/2	1142'	9 3/4
494'	7	1174'	9
616'	9	1205'	8 3/4
740'	11 1/2	1236'	8 1/2
864'	11 1/2	1267'	8 1/4
1017'	11 1/2	1331'	7 3/4
1048'	11 1/2	1425'	7 1/2
1079'	11 1/2	1487'	7



# DRILL STEM TEST # 1

INTERVAL: 1156'-1100' = 56'      FORMATION: Green Horn  
WT. on PACKERS: 28,000 lbs.      TYPE TEST: Conventional  
TESTER: Frank Pfannenstiel, Haliburton, Lamar, Colorado.  
PRE-FLOW: 10 Min.      INITIAL HYDROSTATIC PRESSURE: 526 lbs.  
INITIAL-FLOW PRESSURE: 47 lbs.      INITIAL SHUT-IN PRESSURE: 76 lbs.  
INITIAL SHUT-IN: 30 Min.      FINAL FLOW: 60 Min.  
FINAL-FLOW PRESSURE: 47 lbs.      FINAL SHUT-IN PRESSURE: 92 lbs.  
FINAL SHUT-IN: 120 Min.      FINAL HYDROSTATIC PRESSURE: 513 lbs.  
BOTTOM HOLE TEMPERATURE: 100 degrees.

## BLOW CHARACTERISTICS

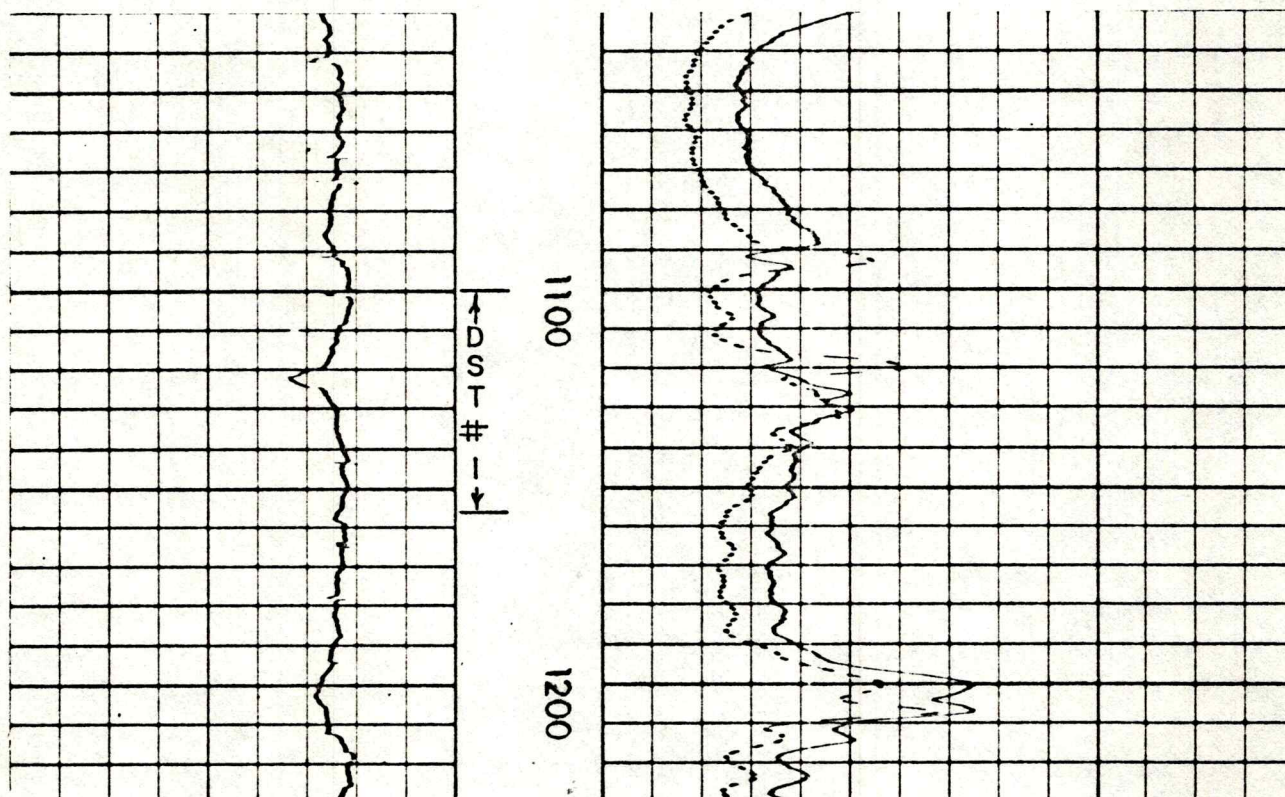
PRE-FLOW: Opened with strong blow, remained thru-out.

FINAL: Opened with strong blow, decreased to moderate blow within 10 minutes, gradual decrease thru the hour.

RECOVERY: 10' mud.

SAMPLER: 1800 cc mud, .010 cu ft gas.

30 pounds pressure, 66 units  $C_1$  - 4 units  $C_2$  by Chromatograph.





## DRILL STEM TEST # 2

INTERVAL: 1430'-1370' = 60'      FORMATION: Dakota  
WT. on PACKERS: None      TYPE TEST: Inflatable  
TESTER: Ken Beler, Lyons-Virg's, Sterling, Colorado  
PRE-FLOW: 10 Min.      INITIAL HYDROSTATIC PRESSURE: 736 lbs.  
INITIAL-FLOW PRESSURE: 37 lbs.      INITIAL SHUT-IN PRESSURE: 49 lbs.  
INITIAL SHUT-IN: 30 Min.      FINAL FLOW: 60 Min.  
FINAL-FLOW PRESSURE: 37 lbs.      FINAL SHUT-IN PRESSURE: 61 lbs.  
FINAL SHUT-IN: 120 Min.      FINAL HYDROSTATIC PRESSURE: 675 lbs.  
BOTTOM HOLE TEMPERATURE: 53 degrees. ?

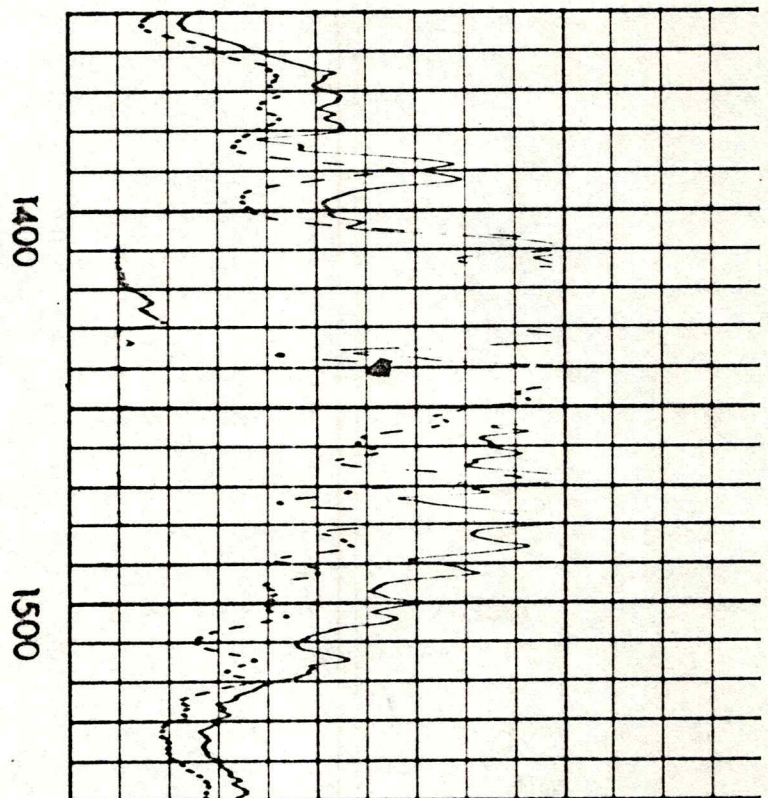
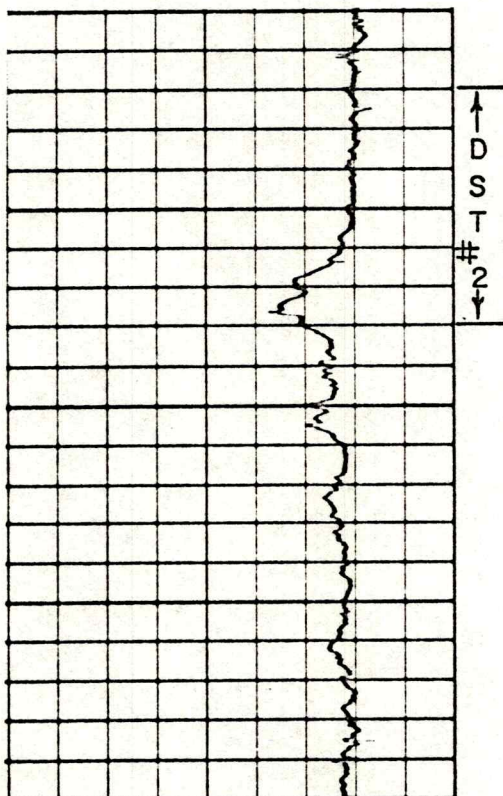
### BLOW CHARACTERISTICS:

PRE-FLOW: Opened with fair blow increasing to 8"-surging.

FINAL: Opened with fair blow to 8", decrease to dead in  
10 minutes. Surging thru remainder of test. (50 Min.)

RECOVERY: 10' mud, slight trace of gas.

SAMPLER: 1100 cc mud, very slight trace of gas.  
pressure not readable.





### DRILL STEM TEST # 3

INTERVAL: 700' - 609' = 91'      FORMATION: Niobrara  
WT. on PACKERS: None      TYPE TEST: Inflatable  
TESTER: Ken Beler, Lyons-Virg's. Sterling, Colorado  
PRE-FLOW: 10 Min.      INITIAL HYDROSTATIC PRESSURE: 343 lbs.  
INITIAL-FLOW PRESSURE: 37-49 lbs.      INITIAL SHUT-IN PRESSURE: 147 lbs.  
INITIAL SHUT-IN: 30 Min.      FINAL FLOW: 60 Min.  
FINAL-FLOW PRESSURE: 61-98 lbs.      FINAL SHUT-IN PRESSURE: 123 lbs.  
FINAL SHUT-IN: 120 Min.      FINAL HYDROSTATIC PRESSURE: 306 lbs.  
BOTTOM HOLE TEMPERATURE: 78 degrees.

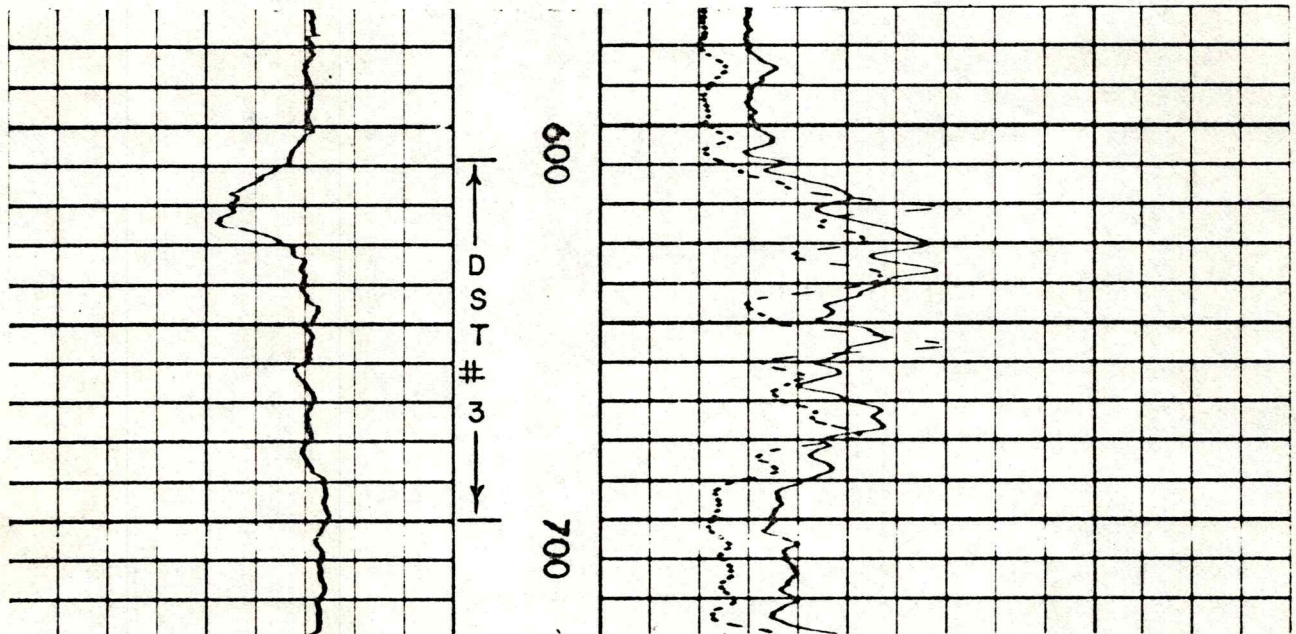
#### BLOW CHARACTERISTICS:

PRE-FLOW: Opened with poor blow increase to 3" decreased back to 1" in 4 minutes.

FINAL: Opened to 1" decreased to few bubbles in 30 minutes. Slight bubbles thru-out remainder of test (30 Min.)

RECOVERY: 126' mud, some water and gas cut mud.

SAMPLER: Slight gas, 10 pounds of pressure.





SAMPLE DESCRIPTION  
(Depths Corrected for Lag)

From	To	Feet	Description
200'	210'	10'	Cement plug.
210'	240'	30'	Shale, dark grey-black, firm, calcareous, silty in part, trace limestone stringers cream-white-brown, firm, dense, chrystalline.
240'	300'	60'	Shale, dark grey-black, firm-soft, less calcareous, silty in part, carbonaceous..
300'	320'	20'	Shale, as above with abundant shell frags.
320'	340'	20'	Shale, dark grey-black, soft-firm, silty, waxy in part, slightly calcareous, trace limestone stringers, white-cream, dense.
340'	360'	20'	Shale, as above with traces of sandstone, white-clear-brown-s&p, fine to very fine grained, sub-angular, friable, fractured.
360'	400'	40'	Shale, dark grey-black-brownsh, soft-firm, calcareous in part, silty in part, some carbonaceous to coaly fragments, fractured.
400'	440'	40'	Shale, as above with sandstone, white-clear-brown-s&p, fine to very fine grained, sub-angular, friable, looks fractured.
440'	500'	60'	Shale, dark grey-brown-black, firm, carbonaceous, calcareous to limy, abundant pyrite thru-out.
500'	540'	40'	Shale, dark grey-brown-black, soft-firm, slightly calcareous, waxy in part, coaly.
540'	560'	60'	Shale as above, sandstone, white-brown, fine to very fine grained, sub-angular, friable, silty in part, fractured.
560'	600'	40'	Shale, dark grey-brown-black, soft-firm, carbonaceous, calcareous, trace pyrite.
600'	620'	20'	Shale as above with trace sandstone as above, looks like fault fractures.
620'	640'	20'	Shale, grey to dark-black, firm, carbonaceous, calcareous to limy.
640'	660'	20'	Shale as above with sandstone, white-brown,



# SAMPLE DESCRIPTION CONT'D.

			sub-angular, fine grained, friable.
660'	700'	40'	Shale, grey-dark-brown-black, firm, calcareous to limy, carbonaceous, trace limestone stringers, clear-brown, dense, crystalline, some pyrite, fractured.
700'	720'	20'	Shale, dark grey-brown-black, soft-firm, less calcareous, carbonaceous, fractured.
720'	760'	40'	Shale, dark grey-black, firm, blocky, highly fractured, calcareous, some limestone, pyrite. Note: lost sandstone lenses.
760'	780'	20'	Shale as above with abundant limestone, brown-cream, dense, crystalline, trace to some carbonaceous material, some plant fragments, fractured.
FT. HAYS 764'			(+7138')
780'	800'	20'	Shale, dark grey-black-brownsh, very calcareous, trace to some coaly fragments.
800'	820'	20'	Shale as above with some limestone, brown, dense, crystalline, fractured.
820'	880'	60'	Shale, dark grey-black, calcareous, firm, carbonaceous, limy in part, looks metallic, some sandstone, white-clear-brown-s&p, sub-angular-sub-rounded, fine grained, calcareous in part, friable in part, looks like slickenslide from a fault. Fractured.
CODELL SAND 835'			(+7067')
880'	900'	20'	Shale as above with increase in limestone, brown-cream, dense, crystalline, fractured.
900'	960'	60'	Shale, dark grey-black-brownsh, firm, calcareous to limy, almost marly, dense, trace pyrite, trace siltstone in part, carbonaceous in part, fractured.
GREEN HORN 907'			(+6995')
960'	1000'	40'	Shale as above, no siltstone, abundant limestone, cream-brown, dense, crystalline, abundant pyrite, fractured?
1000'	1020'	20'	Shale, dark grey-black, firm, calcerous, carbonaceous in part, trace to some sandstone, tan-brown-s&p, fine grained, sub-rounded, loose-friable, trace chert.



# SAMPLE DESCRIPTION CONT'D.

1020'	1060'	40'	Shale as above with some sandstone in part, sandstone, dark-s&p, hard-tite, very calcareous to limy, trace glauconite in part.
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1060'	1090'	30'	Shale, dark grey-black, hard, blocky in part, calcareous, carbonaceous, fractured.
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## START 10' SAMPLES AT 1100'

1090'	1110'	20'	Shale as above with 10% limestone, brown-cream, dense, crystalline, shale splintery in part, fractured ?
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1110'	1120'	10'	Shale, dark grey-black, firm, calcareous, with trace limestone stringers, trace sandstone, brown-s&p, fine-very fine grained, sub-rounded, loose to friable in part, some cemented clusters in part.
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1120'	1156'	36'	Shale as above, trace sandstone as above, abundant limestone, cream-brown, dense, crystalline, looks fractured.
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1156'	circulated samples		Shale as above mostly limestone, brown-cream, dense, crystalline, fractured, samples look like marlstone.
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1156'	1170'	14'	Limestone, cream-brown-dark, dense, crystalline, abundant pyrite, fractured.
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1170'	1210'	40'	Shale, dark grey-black-brownsh, firm, calcerous to limy, carbonaceous in part, few pieces sandstone-siltstone, white-grey, s&p, very fine grained, sub-rounded, grading to siltstone, calcareous, fractured ?
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1210'	1230'	20'	Limestone, brown-cream, dense, crystalline, some shale, dark-black, firm, calcareous, carbonaceous, looks fractured.
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1230'	1250'	20'	Limestone as above, trace to some shale as above, No Visible Sand in Samples.
DAKOTA	1236'		
	(+6666')		

1250'	1280'	30'	Limestone as above decrease in shale. Samples look fractured.
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1280'	1350'	70'	Shale, dark-black, firm-soft, brittle in part, calcareous to limy, carbonaceous to coaly in part.
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# SAMPLE DESCRIPTION CONT'D.

1350'	1370'	20'	Shale, dark-black, firm-soft, brittle in part, calcareous to limy, carbonaceous, traces of sandstone within the limestone matrix, sandstone, white-grey-s&p, fine grained, sub-angular/sub-rounded, looks highly fractured-faulted.
1370'	1380'	10'	Shale, dark-black, firm-soft, very calcareous to limy in part, some limestone thru-out, brown, dense, crystalline.
1380'	1400'	20'	Shale, dark-black, firm-soft, very carbonaceous, limy in part to limestone, brown, dense, crystalline, trace silt-sand? found two pieces with yellow fluorescence, faint streaming yellow cut, poor show.
1400'	1420'	20'	Shale, dark grey-black, soft-firm, very calcareous to limy in part, carbonaceous, samples look fractured.
1420'	1450'	30'	Limestone, cream-brown, dense, hard, crystalline, trace of some soft creamy lime.
1450'	1470'	20'	Limestone as above 20%, shale, dark grey-black, firm, calcareous-limy, carbonaceous, fractured.
1470'	1490'	20'	Limestone 50%, cream-brown-dark, dense, crystalline, abundant pyrite, shale as above.
1490'	1520'	30'	Shale, dark grey-black, firm-soft, carbonaceous, calcareous to limy, abundant limestone, brown, dense, crystalline, trace greenish-white, soft soapstone in part.
1520'	1540'	20'	Shale and limestone as above, increase in greenish-white, soapstone type shale, soft, trace chert.
MORRISON	1520'		
(+6382')			
1540'	1558'	18'	Shale, dark grey-black-one piece reddish, some greenish-white soapstone type shale, soft in part, trace of chert.
1558'	circulated samples		Shale as above, increase in white-greenish, soft, soapstone type shale, increase in chert pieces.
			T.D. 1558'