Field Report

Fuqua 10-36-28-9

J.M. Huber Corp.
Cherokee Basin
Elk County, Kansas

Submitted To:
J.M. Huber Corp.
1050 17th Street Suite 700
Denver, Colorado 80265

Attention: Mr. David May

Submitted By:
TICORA Geosciences, Inc.
19000 West Highway 72, Suite 100
Arvada, Colorado 80007
Office: (720) 898-8200
Fax: (720) 898-8222

Sept 27, 2003

TICORA Disclaimer

LEGAL NOTICE: This report was prepared by TICORA Geosciences, Inc. as an account of work performed for the client and is intended for informational purposes only. Any use of this information in relation to any specific application should be based on an independent examination and verification of its applicability for such use by professionally qualified personnel. Neither TICORA Geosciences, Inc., nor any persons or organizations acting on its behalf:

a. Makes any warranty or representation, expressed or implied, with respect to the accuracy, completeness, or usefulness of the information contained in this report; or

b. Assumes any liability with respect to the use of, or for damages resulting from the use of, any information, apparatus, method, or process disclosed in this report.

Field Report Summary

Table 1. Well Information	
Well Name: Fuqua 10-36-28-9	**Operator: J.M. Huber Corp.**
County: Elk	**State: Kansas**
Basin: Cherokee	**Field: Wildcat**
Groups: Marmaton / Cherokee	**Location: NW NW SE Sec 36 T28S R9E 1,987' FSL and 1,945' FEL**

Reservoir Properties	Units	Value
Cored Interval (Top)	feet	1,723.0
Cored Interval (Bottom)	feet	2,255.4
Total Thickness of Recovered Coal	feet	4.3
Amount of Coal Canistered	feet	3.8
Total Thickness of Prospective Carbonaceous Shale	feet	29.5
Amount of Carbonaceous Shale Canistered	feet	14.2
Reservoir Temperature range	°F	90 - 100
Reservoir Pressure (at Riverton horizon)	psia	959
Reservoir Pressure Gradient	psi/ft	0.433

1. **Introduction:** At the request of Mr. David May, Senior Staff Geoscientist, J.M. Huber Corporation (Huber), TICORA Geosciences, Inc. (TICORA) collected core samples from the Fuqua 10-36-28-9 well for determination of the gas content and resource evaluation of the Marmaton and Cherokee Group coals, Cherokee Basin, Elk County, Kansas. TICORA personnel were on location from 18 September to 22 September 2003. Eighteen desorption samples were collected during this period. Samples arrived back at TICORA's laboratory in Denver on 23 September 2003.

2. **Reservoir Temperature:** Temperature data was provided to TICORA on 18 September by Mr. Red McHoes (Huber wellsite geologist). This data was in the form of a bottom hole temperature recorded by Schlumberger Well Logging Services on the immediately adjacent Fuqua WDW 10-36-28-9. TICORA used the data to calculate reservoir temperatures at the subject well. All desorption experiments were carried out at temperatures between 90°F and 100°F.

   During coring operations, monitoring of circulating fluid temperatures indicated temperatures throughout most of the well were consistent, with no abnormal increases (or decreases) in the assumed geothermal gradient.

For details on circulating temperature measurements, see Appendix v.

3. **Reservoir Pressure:** TICORA is currently using a pressure gradient of 0.433 psi/ft (assumed standard gradient) to calculate reservoir pressures. This gradient will be used until a different gradient is provided by Huber. This gradient will also be used to calculate the lost gas content of desorption samples collected at the subject well.
4. **Drilling Operations:** Layne Christensen Drilling (Calgary, Alberta) spudded the Fuqua 10-36-28-9 well at 19:00 hrs on 17 September 2003. A 12 ¼ inch surface hole was drilled to 139.8 ft., reaching TD at 00:30 hrs on 18 September. Surface casing (8 5/8 inch) was run to 139.8 ft. Cement was penetrated and drilling of a 7 7/8 inch new hole commenced at 12:00 hrs this same day. Core point was reached at a depth of 1,723 ft. at 17:30 hrs on 19 September. Core point was picked by Huber's wellsite geologist (R. McHoes).
5. **Coring Operations:** A total of 62 wire-line retrievable core runs were made from 1,723.0 feet to 2,255.4 feet. Of the 532 feet of 3.0 inch core cut, approximately 506 feet were recovered (95%). The bottom hole coring assembly included a 10.5-foot core barrel, wire-line retrievable inner-tube, and a PDC core bit. The average length of a core run was a little over 10.0 feet. Typically the driller would cut 10.4 to 10.5 feet of core per run, as Layne felt a full core barrel had better chances of complete recovery. Coring fluid was composed of fresh water mud with a density ranging from 8.8 to 9.0 lbs/gallon. Wireline retrieval times ranged from 7 minutes 10 seconds up to 11 minutes and 30 seconds with an average of approximately nine minutes. Table 2 below provides an overview of all core runs containing sampled intervals. See Appendix iii (Core Operations) for a more detailed account of coring operations and also Appendix iv (Daily Field Reports) for more detailed information on day-to-day activities.

Table 2. Core Operations – Fuqua 10-36-28-9

Core Run	From	To	Cored	Recovered	Desorption Samples	Fluid Density	Estimated Reservoir Temperature	Circulating Temperature Out	Core Depth Correction
	(feet)	(feet)	(feet)	(feet)		lbs/gal	(°F)	(°F)	(feet)
1	1,723	1,733	10.5	10.4	1	8.8	90	70.1	---
8	1,789	1,799	10.4	10.4	1	8.8	91.5	67.9	---
9	1,799	1,809	10.4	10.4	1	8.8	91.5	67.9	---
16	1,865	1,875	10.5	10.6	1	8.8	92.7	68.9	---
22	1,925	1,935	8.9	9.2	1	8.8	94.0	75.1	---
24	1,945	1,955	10.0	5.3	2	8.8	94.1	75.1	---
34	2,011	2,021	9.4	10.5	2	8.9	95.6	72.1	---
37	2,041	2,048	7.3	8.6	1	8.9	95.6	72.7	---
38	2,048	2,054	6.0	10.3	1	8.9	95.6	72.7	---
45	2,101	2,111	10.0	10.2	1	8.9	97.4	73.9	---
49	2,142	2,152	10.0	4.0	1	8.9	98.1	73.9	---
53	2,163	2,173	10.3	10.3	1	8.9	98.5	73.9	---
57	2,194	2,204	9.9	10.1	1	9.0	99.1	73.9	---
59	2,214	2,224	10.1	10.1	2	9.0	99.4	74.1	---
60	2,224	2,234	9.9	10.0	1	9.0	99.4	74.1	---

6. **Core-to-Log Correction:** At the time this report was written, a copy of the E-log was not available to the writer to make a determination of the core-to-log correction.

7. **Sampling Program:** Eighteen desorption core samples (3.0 inch diameter by one-foot in length) were collected from the Fuqua 10-36-28-9 well. Core samples were placed in a plastic liner inside 3.5 inch aluminum desorption canisters. Produced water from the Dart Operating Company South Williams Compressor Station (located in Sec 34 T33S R14E) was then added to the canister. This produced water comes from a series of Dart Cherokee Basin CBM wells producing in Montgomery County, Kansas that were completed in early November of 2002 (TICORA was in charge of collecting desorption samples from these wells). This water was preheated to

reservoir temperature. This reduction in headspace volume increases the accuracy of desorption measurements and also improves the quality of gas samples collected for sorbed phase gas analysis by displacing atmospheric contamination. Desorption canisters were then placed in water baths at the appropriate reservoir temperature.

All non-sampled core was described, photographed, boxed and transported to Triple O Slabbing, Denver, CO. Table 3 provides a brief account concerning the collection of desorption samples from the Fuqua 10-36-28-9 well. See Appendix i for a detailed Summary of Desorption Samples.

Table 3. Desorption Samples – Fuqua 10-36-28-9

TICORA Number	Canister Number	From	To	Seam Designation	Time Core @ Surface	Time Canister Sealed	Desorption Temperature
		(feet)	(feet)		(hr:min:sec)	(hr:min:sec)	(°F)
293-1	GT-38	1,723.0	1,724.0	Hold'nville	23:49:45	23:56:22	90
293-2	GT-68	1,797.6	1,798.6	Bandera	4:51:50	05:01:15	90
293-3	GT-138	1,801.8	1,802.8	Bandera	5:27:23	05:39:17	90
293-4	GT-401	1,865.6	1,866.6	Mulberry	10:55:20	11:05:26	95
293-5	GT-370	1,930.4	1,931.4	Little Osage Sh	15:39:15	15:47:56	95
293-6	GT-37	1,949.1	1,950.1	Excello Shale	17:14:35	17:22:10	95
293-7	GT-155	1,951.6	1,951.8	Mulky Coal	17:48:31	17:57:48	95
293-8	GT-273	2,018.4	2,019.4	Bevier	01:05:12	01:15:38	95
293-9	GT-276	2,019.4	2,020.4	Bevier	01:05:12	01:16:41	95
293-10	GT-163	2,043.6	2,044.6	un-named	03:25:30	03:39:01	95
293-11	GT-216	2,051.8	2,052.8	Crow'burg	04:07:33	04:17:32	95
293-12	GT-284	2,108.0	2,109.0	Tebo	10:11:40	10:21:33	95
293-13	GT-298	2,144.7	2,145.7	Weir	13:36:20	13:41:35	100
293-14	GT-304	2,167.9	2,168.9	Rowe	16:04:10	16:33:46	100
293-15	GT-312	2,197.8	2,198.8	Neutral	19:42:00	19:54:10	100
293-16	GT-336	2,215.2	2,216.2	Riverton	21:13:18	21:25:26	100
293-17	GT-345	2,222.5	2,223.5	Riverton	21:13:18	21:26:33	100
293-18	GT-388	2,227.6	2,228.6	Riverton	21:52:30	22:01:37	100

8. **Special Testing:** Samples 293-4, 9, 11, 12, and 17 were selected for gas composition analysis. Gas composition samples (usually three to six) will be collected during the desorption life of these samples. In the field, three gas composition samples were collected from 293-4, 293-9, and 293-11, two gas composition samples were collected from 293-17 and one sample was collected from 293-12. No temperature experiments were conducted due to the lack of twin samples of coal.

   Samples 293-2, 4, 8, 11, 14, and 17 were selected for ***RapidGas***^{SM} analysis. Table 4 provides a brief summary of the desorption experiments.

Table 4. Special Testing – Fuqua 10-36-28-9

TICORA Number	Canister Number	***RapidGas***^{SM} Canisters	Gas Sample Canisters	Reservoir Temperature Experiment
293-2	GT-68	X		
293-4	GT-401	X	X	
293-8	GT-273	X		
293-9	GT-276		X	
293-11	GT-216	X	X	
293-12	GT-284		X	
293-14	GT-304	X		
293-17	GT-345	X	X	

9. **Comments on the Reservoir System**: Supplement II- Field Assessment of Reservoir System Thickness (Appendix ii) gives a brief summary of the various carbonaceous shale / coal reservoirs penetrated in the subject well. An attempt was made in the field to identify all recovered core that was giving any indication of visibly desorbing gas. This process is sometimes complicated by poor lighting conditions and / or weather factors. Also, some carbonaceous shales will desorb gas at such low rates or volumes that canistering the sample and capturing the gas is the only method to confirm that the shale is gas-bearing. Coloration and qualitative density assessment of the shale is also taken into account if no visibly desorbing gas is evident. Since all the core in this well was examined by the same person, the visual quality and density assessment will have a consistency throughout the cored section.

This document should be used in conjunction with the analysis of reservoir thickness derived from the assessment of the density logs. For the Huber Fuqua 10-36-28-9 well, the field assessment of the reservoir thickness in both the Marmaton and Cherokee groups is estimated to include approximately **5.9 feet of coal (includes 1.6 feet of coal presumed slipped and lost) and 29.5 feet of prospective carbonaceous shale**.

A limited number of limestone intervals in the Fuqua 10-36-28-9 well were noted to have hydrocarbon shows. Appendix vi provides a tabulation of these show intervals and provides a brief description of each occurrence.

List of Appendices:

Appendix i

Supplement I - Desorption Sample Summary

Supplement I –
Desorption Sample Summary
J. M. Huber Corp.
Fuqua 10-36-28-9

Submitted to: Mr. David May / Rod Prosceno

Submitted by: Randy Laney / Justin Christofferson

Well: Fuqua 10-36-28-9

Head Space Fluid: Produced water **Core Size:** 3.0"

		Depth interval						Gas Desorbed			
TICORA Number	Canister Number	Top	Bottom	Reservoir	Amount of **Coal** in 1.0 ft sample	Raw Sample Weight	Calc. Sample Density	First Hour	First 24 Hours	Bath Temp.	Additional Comments
		(ft)	(ft)		(ft)	(grams)	(gm/cm^3)	(cm^3)	(cm^3)	(^0F)	
293-1	GT-38	1,723.0	1,724.0	Hold'nville	0.0	3,554	2.56	18	68	90	carb shale
293-2	GT-68	1,797.6	1,798.6	Bandera	0.0	3,260	2.35	26	76	90	carb shale
293-3	GT-138	1,801.8	1,802.8	Bandera	0.0	3,398	2.44	22	58	90	carb shale
293-4 [2]	GT-401	1,865.6	1,866.6	Mulberry	0.8	1,886	1.36	133	591	95	
293-5	GT-370	1,930.4	1,.931.4	Little Osage Sh	0.0	2,964	2.13	22	78	95	carb shale
293-6	GT-37	1,949.1	1,950.1	Excello Shale	<0.1	3,206	2.31	26	109	95	
293-7	GT-155	1,951.6	1,951.8	Mulky Coal	0.2	268 [3]	1.55	26	105	95	
293-8	GT-273	2,018.4	2,019.4	Bevier	0.0	3,240	2.33	34	137	95	carb shale
293-9 [2]	GT-276	2,019.4	2,020.4	Bevier	0.5	2,150	1.55	120	576	95	
293-10	GT-163	2,043.6	2,044.6	un-named	0.0	3,418	2.46	7	31	95	carb shale
293-11 [2]	GT-216	2,051.8	2,052.8	Crow'burg	0.9	2,480	1.78	296	1,187	95	
293-12 [2]	GT-284	2,108.0	2,109.0	Tebo	0.2	2,866	2.06	21	133	95	
293-13	GT-298	2,144.7	2,145.7	Weir	0.0	3,564	2.56	23	61	100	carb shale
293-14	GT-304	2,167.9	2,168.9	Rowe	0.0	3,446	2.48	20	55	100	carb shale
293-15	GT-312	2,197.8	2,198.8	Neutral	0.0	3,266	2.35	6	50	100	carb shale
293-16	GT-336	2,215.2	2,216.2	Riverton	0.4	2,306	1.66	91	420	100	
293-17 [2]	GT-345	2,222.5	2,223.5	Riverton	0.7	2,366	1.70	144	686	100	
293-18	GT-388	2,227.6	2,228.6	Riverton	0.0	3,040	2.19	50	232	100	carb shale
Approx. Net Feet of Canistered Coal = 3.8											

[1]Calculated Sample Density is based on a field measurement of sample weight and is figured on an intact cylinder of core 3.0" in diameter and 12.0" in length. When core samples are fragmented or rubblized, or the core is somewhat under gauge due to washing out of the exterior surface, calculated field densities can appear low.

[2] Gas samples being taken on canister to determine sorbed phase gas composition.

[3] Only 0.2 ft. of coal placed in canister (recovered from slipped core run)

Supplement I –

Desorption Sample Summary

J. M. Huber Corp.
Fuqua 10-36-28-9

Abbreviations:
RGS – Rapid Gas Sample
DS - Density Spectrum
carb - carbonaceous
Sh - Shale

The table above briefly summarizes recent data acquired by TICORA for Marmaton and Cherokee Group Coals and carbonaceous shales in the subject well.

An Ohaus brand digital scale was used to weigh the canistered samples before sealing. The measured weights and calculated densities are given above. Since these are field measurements, the numbers are subject to revision once the samples are actually pulled and weighed back in the lab. One of the corrections to these measurements will be weight loss due to removal of water when the samples are air dried in the lab.

The weights and densities offered here are much better representations of what actually went into the canister than can be done on a verbal basis. Only minimal time was required to obtain the measurements (approx. 20 additional seconds per sample). They are given here to help judge the gross quality of the sample that went into the canister and how that relates to early time desorbed volumes.

Desorbed gas volumes are listed for the *'first hour'* and *'first 24 hrs'* of measurement. They are offered here as rough indications of core diffusivities and as an internal comparison between samples. Not enough data is available at this early date to utilize these numbers for an estimate of gas content.

Appendix ii

Supplement II- Field Assessment of Reservoir System Thickness

Supplement II-

Field Assessment of Reservoir System Thickness

Fuqua 10-36-28-9

Submitted To: David May

Submitted By: Randy Laney

Well: Fuqua 10-36-28-9

Core Size: 3.0"

Head Space Fluid: produced water

NOTE: Estimates of *'Reservoir System Thickness'* given in this summary refers to the full extent of prospective (gas bearing) carbonaceous shale, coaly shale, shaly coal and coal observed when laid down in the core tray. For those intervals that have been designated as part of the reservoir system but were not sampled, the RST has been applied on the basis of similarities (i.e. coloration and density) to intervals that were sampled and found to have measurable gas contents. Densities generally range up to 2.1 – 2.2 gm/cm^3, but can occasionally run to higher values.

	Depth Interval							
TICORA Number	Top	Bottom	Reservoir	Coal Thickness	Prospective Carb Shale Thickness	Calc. Sample Density	volume desorbed in first 24 hrs	RESERVOIR SYSTEM THICKNESS
	feet	feet		decimal ft.	decimal ft	gm/cm^3	cm^3	decimal ft.
Note: The first signs of visibly desorbing gas in recovered core occurs at a depth of 1,723.0' in the subject well.								
Marmaton Group								
293-1	1,723.0	1,724.0	Holdenville	---	1.0	2.56	68	1.0 carb sh
293-2	1,797.6	1,798.6	Bandera	---	1.0	2.35	76	1.0 carb sh
---	1,801.5	1,801.8	Bandera	---	0.3	---	---	1.3 carb sh
293-3	1,801.8	1,802.8		---	1.0	2.44	58	
---	1,865.5	1,865.6	Mulberry	---	0.1	---	---	0.8 coal 0.4 carb sh = 1.2
293-4	1,865.6	1,866.6		0.8	0.2	1.36	591	
---	1,866.6	1,866.7		---	0.1	---	---	
---	1,895.3	1,897.4	---	---	2.1	---	---	2.1 carb sh

Supplement II-

Field Assessment of Reservoir System Thickness

Fuqua 10-36-28-9

	Depth Interval							
TICORA Number	Top	Bottom	Reservoir	Coal Thickness	Prospective Carb Shale Thickness	Calc. Sample Density	volume desorbed in first 24 hrs	RESERVOIR SYSTEM THICKNESS
	feet	feet		decimal ft.	decimal ft	gm/cm^3	cm^3	decimal ft.
---	1,930.2	1,930.4	Little Osage Shale	---	0.2	---	---	1.9 carb sh
293-5	1,930.4	1,931.4		---	1.0	2.13	78	
---	1,931.4	1,932.1		---	0.7	---	---	
Cherokee Group								
---	1,947.1	1,949.1	Excello Sh & Mulky Coal	---	2.0	---	---	up to 1.9 coal and 3.0 carb sh = 4.9
293-6	1,949.1	1,950.1		<<0.1	1.0	2.31	109	
lost core	1,950.1	1,951.6		1.6 ?	--- ?	---	---	
293-7	1,951.6	1,951.8		0.2	---	1.55	105	
---	2,018.2	2,018.4	Bevier	---	0.2	---	---	0.5 coal 1.7 carb sh = 2.2
293-8	2,018.4	2,019.4		---	1.0	2.33	137	
293-9	2,019.4	2,020.4		0.5	0.5	1.55	576	
---	2,043.0	2,043.6	un-named	---	0.6	---	---	2.2 carb sh
293-10	2,043.6	2,044.6		---	1.0	2.46	31	
---	2,044.6	2,045.2		0.1	0.5	---	---	
---	2,050.4	2,051.8	Croweburg	---	1.4	---	---	1.1 coal 1.7 carb sh = 2.8
293-11	2,051.8	2,052.8		0.9	0.1	1.78	1,187	
---	2,052.8	2,053.2		0.2	0.2	---	---	

Supplement II-

Field Assessment of Reservoir System Thickness

Fuqua 10-36-28-9

	Depth Interval							
TICORA Number	Top	Bottom	Reservoir	Coal Thickness	Prospective Carb Shale Thickness	Calc. Sample Density	volume desorbed in first 24 hrs	RESERVOIR SYSTEM THICKNESS
	feet	feet		decimal ft.	decimal ft	gm/cm^3	cm^3	decimal ft.
---	2,075.7	2,076.4	un-named	---	0.7	---	---	0.7 carb sh
---	2,080.3	2,080.9	un-named	<0.2	0.4	---	---	<0.2 coal 0.4 carb shale = 0.6
---	2,107.7	2,108.0	Tebo	---	0.3	---	---	0.2 coal 1.1 carb sh = 1.3
293-12	2,108.0	2,109.0		0.2	0.8	2.06	133	
---	2,131.0	2,132.4	un-named	---	1.4	---	---	1.4 carb sh
---	2,144.0	2,144.7	Weir	---	0.7	---	---	1.7 carb sh
293-13	2,144.7	2,145.7		---	1.0	2.56	61	
---	2,167.0	2,167.9	Rowe	---	0.9	---	---	2.9 carb sh
293-14	2,167.9	2,168.9		---	1.0	2.48	55	
---	2,168.9	2,169.9		---	1.0	---	---	
---	2,196.8	2,197.8	Neutral	---	1.0	---	---	2.0 carb sh
293-15	2,197.8	2,198.8		---	1.0	2.35	50	
---	2,202.2	2,203.0	un-named	---	0.8	---	---	0.8 carb sh
293-16	2,215.2	2,216.2	Riverton	0.4	0.6	1.66	420	0.4 coal 0.6 carb sh = 1.0

Supplement II-

Field Assessment of Reservoir System Thickness

Fuqua 10-36-28-9

	Depth Interval							
TICORA Number	Top	Bottom	Reservoir	Coal Thickness	Prospective Carb Shale Thickness	Calc. Sample Density	volume desorbed in first 24 hrs	RESERVOIR SYSTEM THICKNESS
	feet	feet		decimal ft.	decimal ft	gm/cm^3	cm^3	decimal ft.
---	2,222.3	2,222.5	Riverton	---	0.2	---	---	0.7 coal 0.5 carb sh = 1.2
293-17	2,222.5	2,223.5		0.7	0.3	---	686	
293-18	2,227.6	2,228.6	Riverton Sh	---	1.0	2.19	232	1.2 carb sh
---	2,228.6	2,228.8		---	0.2	---	---	
			Totals*	**5.9**	**29.5**			

[1]Calculated Sample Density is based on a field measurement of sample weight and is figured on an intact cylinder of core 3.0" in diameter and 12" in length. When core samples are fragmented or rubblized, calculated field densities can appear low.

* Includes coal that was not recovered but believed present. Recovered total coal footage is equal to 4.3 feet.

Note: Reservoir nomenclature has tried to adhere to the system given in *"The Stratigraphic Succession in Kansas"* State Geological Survey of Kansas Bulletin 189, edited by Doris E. Zeller.

Appendix iii

Core Operations

WIRELINE CORE OPERATIONS

Date: 9/19/2003

CORE RUN: 1

OPERATOR: J.M. Huber Corporation
WELL: Fuqua 10-36-28-9
FIELD/PROSPECT: Wildcat
COUNTY: Elk
STATE: Kansas

LOCATION: 1,987' FSL and 1,945' FEL
SECTION: 36
TOWNSHIP: 28S
RANGE: 9E
ELEV. (FT.): G.L.: 1,202' K.B.: 1,211'
*Datum: KB

OPERATOR: **J.M. Huber Corp.** 1050 17th Street Suite 700 Denver, CO 80265
Mr David May Senior Staff Geoscientist off: (303) 825-7900 fax: (303) 825-8300
Mr. Rod Prosceno Engineer 1614 Cedar View Drive Cody, WY 82414 (307) 587-3489
RIG: **Layne Drilling** (Calgary, Alberta), Rig #232
SERVICE: **Mr. Red McHoes** Wellsite Geologist (307) 752-6362
Schlumberger E-logs Ft. Smith, Arkansas

			CORE RUN: 1						
			Footage	Start (h:mm:s)	End (h:mm:s)	ROP (h:mm:s)	Canister No.	Can Sealed (h:mm:s)	TICORA No.
Date/Time Start Core:	9/19/2003 23:18	1	1723-1724	23:18:10	23:19:24	0:01:14	GT-38	23:56:22	293-1
Date/Time End Core:	9/19/2003 23:31	2	1724-1725	23:19:24	23:20:56	0:01:32			
Date/Time Start TOH:	9/19/2003 23:41	3	1725-1726	23:20:56	23:22:10	0:01:14			
Date/Time Barrel @ Surface:	9/19/2003 23:49	4	1726-1727	23:22:10	23:23:34	0:01:24			
Core Barrel Trip Time:	8:04	5	1727-1728	23:23:34	23:24:37	0:01:03			
Fluid Density/Viscosity:	8.8 ppg	6	1728-1729	23:24:37	23:25:38	0:01:01			
Fluid Temp. In (°F):	69.6	7	1729-1730	23:25:38	23:27:25	0:01:47			
Fluid Temp. Out (°F):	70.1	8	1730-1731	23:27:25	23:28:56	0:01:31			
Pump Pressure (psig):	150	9	1731-1732	23:28:56	23:30:21	0:01:25			
Pump Rate (spm/gpm):	16 SPM	10	1732-1733	23:30:21	23:31:50	0:01:22			
Weight on Bit (lbs):	3,000	11							
RPM:	70-80	12							
Group:	Marmaton	13							
Feet Cored:	10.5	14							
Feet Recovered:	10.4	15							
Reservoir Temp (°F):	90	16							
Surf. Temp/Press (°F/in-Hg):	44.8 / 29.04	17							
Reservoir Top:	1,723	18							
Reservoir Bottom:	1,724	19							
Coal Top:		20							
Coal Bottom:									

TICORA: Laney / Baum / Christofferson / Denis

TICORA GEOSCIENCES, INC.

WIRELINE CORE OPERATIONS

Date: 9/20/2003

CORE RUN: 8

OPERATOR: J.M. Huber Corporation
WELL: Fuqua 10-36-28-9
FIELD/PROSPECT: Wildcat
COUNTY: Elk
STATE: Kansas

LOCATION: 1,987' FSL and 1,945' FEL
SECTION: 36
TOWNSHIP: 28S
RANGE: 9E
ELEV. (FT.): G.L.: 1,202' K.B.: 1,211'
*Datum: KB

OPERATOR: **J.M. Huber Corp.** 1050 17th Street Suite 700 Denver, CO 80265
Mr David May Senior Staff Geoscientist off: (303) 825-7900 fax: (303) 825-8300
Mr. Rod Prosceno Engineer 1614 Cedar View Drive Cody, WY 82414 (307) 587-3489
RIG: **Layne Drilling** (Calgary, Alberta), Rig #232
SERVICE: **Mr. Red McHoes** Wellsite Geologist (307) 752-6362
Schlumberger E-logs Ft. Smith, Arkansas

Date/Time Start Core:	9/20/2003 4:10
Date/Time End Core:	9/20/2003 4:32
Date/Time Start TOH:	9/20/2003 4:43
Date/Time Barrel @ Surface:	9/20/2003 4:51
Core Barrel Trip Time:	0:08:37
Fluid Density/Viscosity:	8.8 ppg
Fluid Temp. In (°F):	67.8
Fluid Temp. Out (°F):	67.9
Pump Pressure (psig):	150
Pump Rate (spm/gpm):	16
Weight on Bit (lbs):	3000-4000
RPM:	70-80
Group:	Marmaton
Feet Cored:	10.4
Feet Recovered:	10.4
Reservoir Temp (°F):	91.5
Surf. Temp/Press (°F/in-Hg):	41.0 / 29.05
Reservoir Top:	1,797.6
Reservoir Bottom:	1,798.6
Coal Top:	
Coal Bottom:	

CORE RUN: 8

	Footage	Start (h:mm:s)	End (h:mm:s)	ROP (h:mm:s)	Canister No.	Can Sealed (h:mm:s)	TICORA No.
1	1789-1790	4:10:01	4:12:11	0:02:10			
2	1790-1791	4:12:11	4:14:12	0:02:01			
3	1791-1792	4:14:12	4:16:36	0:02:24			
4	1792-1793	4:16:36	4:19:11	0:02:35			
5	1793-1794	4:19:11	4:21:57	0:02:46			
6	1794-1795	4:21:57	4:24:29	0:02:32			
7	1795-1796	4:24:29	4:26:49	0:02:20			
8	1796-1797	4:26:49	4:28:52	0:02:03			
9	1797-1798	4:28:52	4:31:02	0:02:10	GT-68	5:01:15	293-2
10	1798-1799	4:31:02	4:32:26	0:02:14			
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

TICORA GEOSCIENCES, INC.

WIRELINE CORE OPERATIONS

Date: 9/20/2003

CORE RUN: 9

OPERATOR: J.M. Huber Corporation
WELL: Fuqua 10-36-28-9
FIELD/PROSPECT: Wildcat
COUNTY: Elk
STATE: Kansas

LOCATION: 1,987' FSL and 1,945' FEL
SECTION: 36
TOWNSHIP: 28S
RANGE: 9E
ELEV. (FT.): G.L.: 1,202' K.B.: 1,211'
*Datum: KB

OPERATOR: **J.M. Huber Corp.** 1050 17th Street Suite 700 Denver, CO 80265
Mr David May Senior Staff Geoscientist off: (303) 825-7900 fax: (303) 825-8300
Mr. Rod Prosceno Engineer 1614 Cedar View Drive Cody, WY 82414 (307) 587-3489
RIG: **Layne Drilling** (Calgary, Alberta), Rig #232
SERVICE: **Mr. Red McHoes** Wellsite Geologist (307) 752-6362
Schlumberger E-logs Ft. Smith, Arkansas

			CORE RUN: 9						
			Footage	Start (h:mm:s)	End (h:mm:s)	ROP (h:mm:s)	Canister No.	Can Sealed (h:mm:s)	TICORA No.
Date/Time Start Core:	9/20/2003 5:01	1	1799-1800	5:01:12	5:01:57	0:00:45			
Date/Time End Core:	9/20/2003 5:08	2	1800-1801	5:01:57	5:02:37	0:00:40			
Date/Time Start TOH:	9/20/2003 5:18	3	1801-1802	5:02:37	5:03:29	0:00:52			
Date/Time Barrel @ Surface:	9/20/2003 5:27	4	1802-1803	5:03:29	5:04:22	0:00:53	GT-138	5:39:17	293-3
Core Barrel Trip Time:	0:08:53	5	1803-1804	5:04:22	5:05:12	0:00:50			
Fluid Density/Viscosity:	8.8 ppg	6	1804-1805	5:05:12	5:05:56	0:00:44			
Fluid Temp. In (°F):	67.8	7	1805-1806	5:05:56	5:06:40	0:00:44			
Fluid Temp. Out (°F):	67.9	8	1806-1807	5:06:40	5:07:20	0:00:40			
Pump Pressure (psig):	150	9	1807-1808	5:07:20	5:08:05	0:00:45			
Pump Rate (spm/gpm):	16	10	1808-1809	5:08:05	5:08:57	0:00:47			
Weight on Bit (lbs):	3000-4000	11							
RPM:	70-80	12							
Group:	Marmaton	13							
Feet Cored:	10.4	14							
Feet Recovered:	10.4	15							
Reservoir Temp (°F):	91.5	16							
Surf. Temp/Press (°F/in-Hg):	40.0 / 29.05	17							
Reservoir Top:	1,801.5	18							
Reservoir Bottom:	1,802.8	19							
Coal Top:		20							
Coal Bottom:									

TICORA: Laney / Baum / Christofferson / Denis

TICORA GEOSCIENCES, INC.

WIRELINE CORE OPERATIONS

Date: 9/20/2003

CORE RUN: 16

OPERATOR: J.M. Huber Corporation
WELL: Fuqua 10-36-28-9
FIELD/PROSPECT: Wildcat
COUNTY: Elk
STATE: Kansas

LOCATION: 1,987' FSL and 1,945' FEL
SECTION: 36
TOWNSHIP: 28S
RANGE: 9E
ELEV. (FT.): G.L.: 1,202' K.B.: 1,211'
*Datum: KB

OPERATOR: **J.M. Huber Corp.** 1050 17th Street Suite 700 Denver, CO 80265
Mr David May Senior Staff Geoscientist off: (303) 825-7900 fax: (303) 825-8300
Mr. Rod Prosceno Engineer 1614 Cedar View Drive Cody, WY 82414 (307) 587-3489
RIG: **Layne Drilling** (Calgary, Alberta), Rig #232
SERVICE: **Mr. Red McHoes** Wellsite Geologist (307) 752-6362
Schlumberger E-logs Ft. Smith, Arkansas

Date/Time Start Core:	9/20/2003 10:17
Date/Time End Core:	9/20/2003 10:35
Date/Time Start TOH:	9/20/2003 10:46
Date/Time Barrel @ Surface:	9/20/2003 10:55
Core Barrel Trip Time:	0:09:05
Fluid Density/Viscosity:	8.8 ppg
Fluid Temp. In (°F):	68.7
Fluid Temp. Out (°F):	68.9
Pump Pressure (psig):	150
Pump Rate (spm/gpm):	16
Weight on Bit (lbs):	3,000
RPM:	75
Group:	Marmaton
Feet Cored:	10.5
Feet Recovered:	10.6
Reservoir Temp (°F):	92.7
Surf. Temp/Press (°F/in-Hg):	72.3 / 29.05
Reservoir Top:	1,865.5
Reservoir Bottom:	1,866.7
Coal Top:	
Coal Bottom:	

CORE RUN: 16

	Footage	Start (h:mm:s)	End (h:mm:s)	ROP (h:mm:s)	Canister No.	Can Sealed (h:mm:s)	TICORA No.
1	1865-1866	10:17:40	10:19:20	0:01:40	GT-401	11:05:26	293-4
2	1866-1867	10:19:20	10:21:10	0:01:50			
3	1867-1868	10:21:10	10:22:38	0:01:28			
4	1868-1869	10:22:38	10:24:10	0:01:32			
5	1869-1870	10:24:10	10:26:00	0:01:50			
6	1870-1871	10:26:00	10:27:58	0:01:58			
7	1871-1872	10:27:58	10:29:38	0:01:40			
8	1872-1873	10:29:38	10:31:18	0:01:40			
9	1873-1874	10:31:18	10:33:02	0:01:44			
10	1874-1875	10:33:02	10:35:40	0:01:38			
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

TICORA GEOSCIENCES, INC.

WIRELINE CORE OPERATIONS

Date: 9/20/2003

CORE RUN: 22

OPERATOR: J.M. Huber Corporation
WELL: Fuqua 10-36-28-9
FIELD/PROSPECT: Wildcat
COUNTY: Elk
STATE: Kansas

LOCATION: 1,987' FSL and 1,945' FEL
SECTION: 36
TOWNSHIP: 28S
RANGE: 9E
ELEV. (FT.): G.L.: 1,202' K.B.: 1,211'
*Datum: KB

OPERATOR: **J.M. Huber Corp.** 1050 17th Street Suite 700 Denver, CO 80265
Mr David May Senior Staff Geoscientist off: (303) 825-7900 fax: (303) 825-8300
Mr. Rod Prosceno Engineer 1614 Cedar View Drive Cody, WY 82414 (307) 587-3489
RIG: **Layne Drilling** (Calgary, Alberta), Rig #232
SERVICE: **Mr. Rod McHoes** Wellsite Geologist (307) 752-6362
Schlumberger E-logs Ft. Smith, Arkansas

			CORE RUN: 22						
			Footage	Start (h:mm:s)	End (h:mm:s)	ROP (h:mm:s)	Canister No.	Can Sealed (h:mm:s)	TICORA No.
Date/Time Start Core:	9/20/2003 15:06	1	1925-1926	15:06:45	15:07:48	0:01:03			
Date/Time End Core:	9/20/2003 15:18	2	1926-1927	15:07:48	15:08:53	0:01:05			
Date/Time Start TOH:	9/20/2003 15:30	3	1927-1928	15:08:53	15:10:03	0:01:10			
Date/Time Barrel @ Surface:	9/20/2003 15:39	4	1928-1929	15:10:03	15:11:04	0:01:01			
Core Barrel Trip Time:	0:09:05	5	1929-1930	15:11:04	15:12:02	0:00:58			
Fluid Density/Viscosity:	8.8 ppg	6	1930-1931	15:12:02	15:13:05	0:01:03	GT-370	15:47:56	293-5
Fluid Temp. In (°F):	75.1	7	1931-1932	15:13:05	15:14:25	0:01:20			
Fluid Temp. Out (°F):	75.1	8	1932-1933	15:14:25	15:15:40	0:01:15			
Pump Pressure (psig):	150	9	1933-1934	15:15:40	15:16:48	0:01:08			
Pump Rate (spm/gpm):	16	10	1934-1935	15:16:48	15:18:20	0:01:32			
Weight on Bit (lbs):	3,000	11							
RPM:	75	12							
Group:	Marmaton	13							
Feet Cored:	8.9	14							
Feet Recovered:	9.2	15							
Reservoir Temp (°F):	94	16							
Surf. Temp/Press (°F/in-Hg):	75.1 / 28.93	17							
Reservoir Top:	1,930.2	18							
Reservoir Bottom:	1,932.1	19							
Coal Top:		20							
Coal Bottom:									

TICORA GEOSCIENCES, INC.

WIRELINE CORE OPERATIONS

Date: 9/20/2003

CORE RUN: 24

OPERATOR: J.M. Huber Corporation
WELL: Fuqua 10-36-28-9
FIELD/PROSPECT: Wildcat
COUNTY: Elk
STATE: Kansas

LOCATION: 1,987' FSL and 1,945' FEL
SECTION: 36
TOWNSHIP: 28S
RANGE: 9E
ELEV. (FT.): G.L.: 1,202' K.B.: 1,211'
*Datum: KB

OPERATOR: **J.M. Huber Corp.** 1050 17th Street Suite 700 Denver, CO 80265
Mr David May Senior Staff Geoscientist off: (303) 825-7900 fax: (303) 825-8300
Mr. Rod Prosceno Engineer 1614 Cedar View Drive Cody, WY 82414 (307) 587-3489
RIG: **Layne Drilling** (Calgary, Alberta), Rig #232
SERVICE: **Mr. Red McHoes** Wellsite Geologist (307) 752-6362
Schlumberger E-logs Ft. Smith, Arkansas

			CORE RUN: 24						
			Footage	Start (h:mm:s)	End (h:mm:s)	ROP (h:mm:s)	Canister No.	Can Sealed (h:mm:s)	TICORA No.
Date/Time Start Core:	9/20/2003 16:46	1	1945-1946	16:46:10	16:47:02	0:00:52			
Date/Time End Core:	9/20/2003 16:54	2	1946-1947	16:47:02	16:47:52	0:00:50			
Date/Time Start TOH:	9/20/2003 17:05	3	1947-1948	16:47:52	16:48:37	0:00:45			
Date/Time Barrel @ Surface:	9/20/2003 17:14	4	1948-1949	16:48:37	16:49:34	0:00:57			
Core Barrel Trip Time:	0:09:25	5	1949-1950	16:49:34	16:50:23	0:00:49	GT-37	17:22:10	293-6
Fluid Density/Viscosity:	8.8 ppg	6	1950-1951	16:50:23	16:51:14	0:00:51			
Fluid Temp. In (°F):	75.1	7	1951-1952	16:51:14	16:51:56	0:00:42	GT-155	17:57:48	293-7
Fluid Temp. Out (°F):	75.1	8	1952-1953	16:51:56	16:52:54	0:00:58			
Pump Pressure (psig):	150	9	1953-1954	16:52:54	16:53:49	0:00:55			
Pump Rate (spm/gpm):	16	10	1954-1955	16:53:49	16:54:50	0:01:01			
Weight on Bit (lbs):	3,500	11							
RPM:	78	12							
Group:	Marmaton	13							
Feet Cored:	10	14							
Feet Recovered:	5.3	15							
Reservoir Temp (°F):	94.3	16							
Surf. Temp/Press (°F/in-Hg):	73.1 / 28.90	17							
Reservoir Top:	1,947.1	18							
Reservoir Bottom:	1,951.8	19							
Coal Top:	1,951.6	20							
Coal Bottom:	1,951.8								

TICORA GEOSCIENCES, INC.

WIRELINE CORE OPERATIONS

Date: 9/21/2003

CORE RUN: 34

OPERATOR: J.M. Huber Corporation
WELL: Fuqua 10-36-28-9
FIELD/PROSPECT: Wildcat
COUNTY: Elk
STATE: Kansas

LOCATION: 1,987' FSL and 1,945' FEL
SECTION: 36
TOWNSHIP: 28S
RANGE: 9E
ELEV. (FT.): G.L.: 1,202' K.B.: 1,211'
*Datum: KB

OPERATOR: **J.M. Huber Corp.** 1050 17th Street Suite 700 Denver, CO 80265
Mr David May Senior Staff Geoscientist off: (303) 825-7900 fax: (303) 825-8300
Mr. Rod Prosceno Engineer 1614 Cedar View Drive Cody, WY 82414 (307) 587-3489
RIG: **Layne Drilling** (Calgary, Alberta), Rig #232
SERVICE: **Mr. Red McHoes** Wellsite Geologist (307) 752-6362
Schlumberger E-logs Ft. Smith, Arkansas

Date/Time Start Core:	9/21/2003 0:21
Date/Time End Core:	9/21/2003 0:42
Date/Time Start TOH:	9/21/2003 0:55
Date/Time Barrel @ Surface:	9/21/2003 1:05
Core Barrel Trip Time:	0:09:28
Fluid Density/Viscosity:	8.9 ppg
Fluid Temp. In (°F):	71.8
Fluid Temp. Out (°F):	72.1
Pump Pressure (psig):	150
Pump Rate (spm/gpm):	16
Weight on Bit (lbs):	3,000
RPM:	80
Group:	Cherokee
Feet Cored:	9.4
Feet Recovered:	10.5
Reservoir Temp (°F):	95.6
Surf. Temp/Press (°F/in-Hg):	64.0 / 28.92
Reservoir Top:	2,018.2
Reservoir Bottom:	2,020.4
Coal Top:	2,019.9
Coal Bottom:	2,020.4

CORE RUN: 34

	Footage	Start (h:mm:s)	End (h:mm:s)	ROP (h:mm:s)	Canister No.	Can Sealed (h:mm:s)	TICORA No.
1	2011-2012	0:21:00	0:23:02	0:02:02			
2	2012-2013	0:23:02	0:25:34	0:02:32			
3	2013-2014	0:25:34	0:28:19	0:02:45			
4	2014-2015	0:28:19	0:30:20	0:02:01			
5	2015-2016	0:30:20	0:32:30	0:02:10			
6	2016-2017	0:32:30	0:35:01	0:02:31			
7	2017-2018	0:35:01	0:37:07	0:02:06			
8	2018-2019	0:37:07	0:39:07	0:02:00	GT-273	1:15:38	293-8
9	2019-2020	0:39:07	0:41:11	0:02:04	GT-276	1:16:41	293-9
10	2020-2021	0:41:11	0:42:57	0:01:46			
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

TICORA GEOSCIENCES, INC.

WIRELINE CORE OPERATIONS

Date: 9/21/2003

CORE RUN: 37

OPERATOR: J.M. Huber Corporation
WELL: Fuqua 10-36-28-9
FIELD/PROSPECT: Wildcat
COUNTY: Elk
STATE: Kansas

LOCATION: 1,987' FSL and 1,945' FEL
SECTION: 36
TOWNSHIP: 28S
RANGE: 9E
ELEV. (FT.): G.L.: 1,202' K.B.: 1,211'
*Datum: KB

OPERATOR: **J.M. Huber Corp.** 1050 17th Street Suite 700 Denver, CO 80265
Mr David May Senior Staff Geoscientist off: (303) 825-7900 fax: (303) 825-8300
Mr. Rod Prosceno Engineer 1614 Cedar View Drive Cody, WY 82414 (307) 587-3489
RIG: **Layne Drilling** (Calgary, Alberta), Rig #232
SERVICE: **Mr. Red McHoes** Wellsite Geologist (307) 752-6362
Schlumberger E-logs Ft. Smith, Arkansas

			CORE RUN: 37						
			Footage	Start (h:mm:s)	End (h:mm:s)	ROP (h:mm:s)	Canister No.	Can Sealed (h:mm:s)	TICORA No.
Date/Time Start Core:	9/21/2003 2:54	1	2041-2042	2:54:20	2:55:35	0:01:15			
Date/Time End Core:	9/21/2003 3:01	2	2042-2043	2:55:35	2:56:48	0:01:13			
Date/Time Start TOH:	9/21/2003 3:15	3	2043-2044	2:56:48	2:57:52	0:01:04			
Date/Time Barrel @ Surface:	9/21/2003 3:25	4	2044-2045	2:57:52	2:58:53	0:01:01	GT-163	3:37:01	293-10
Core Barrel Trip Time:	0:09:50	5	2045-2046	2:58:53	2:59:48	0:00:55			
Fluid Density/Viscosity:	8.9 ppg	6	2046-2047	2:59:48	3:00:50	0:01:02			
Fluid Temp. In (°F):	72.6	7	2047-2048	3:00:50	3:01:30	0:00:40			
Fluid Temp. Out (°F):	72.7	8							
Pump Pressure (psig):	150	9							
Pump Rate (spm/gpm):	16	10							
Weight on Bit (lbs):	3,000	11							
RPM:	75	12							
Group:	Cherokee	13							
Feet Cored:	7.3	14							
Feet Recovered:	8.6	15							
Reservoir Temp (°F):	95.6	16							
Surf. Temp/Press (°F/in-Hg):	64.6 / 28.89	17							
Reservoir Top:	2,043.0	18							
Reservoir Bottom:	2,045.2	19							
Coal Top:		20							
Coal Bottom:									

TICORA GEOSCIENCES, INC.

WIRELINE CORE OPERATIONS

Date: 9/21/2003

CORE RUN: 38

OPERATOR: J.M. Huber Corporation
WELL: Fuqua 10-36-28-9
FIELD/PROSPECT: Wildcat
COUNTY: Elk
STATE: Kansas

LOCATION: 1,987' FSL and 1,945' FEL
SECTION: 36
TOWNSHIP: 28S
RANGE: 9E
ELEV. (FT.): G.L.: 1,202' K.B.: 1,211'
*Datum: KB

OPERATOR: **J.M. Huber Corp.** 1050 17th Street Suite 700 Denver, CO 80265
Mr David May Senior Staff Geoscientist off: (303) 825-7900 fax: (303) 825-8300
Mr. Rod Prosceno Engineer 1614 Cedar View Drive Cody, WY 82414 (307) 587-3489
RIG: **Layne Drilling** (Calgary, Alberta), Rig #232
SERVICE: **Mr. Red McHoes** Wellsite Geologist (307) 752-6362
Schlumberger E-logs Ft. Smith, Arkansas

			CORE RUN: 38						
			Footage	Start (h:mm:s)	End (h:mm:s)	ROP (h:mm:s)	Canister No.	Can Sealed (h:mm:s)	TICORA No.
Date/Time Start Core:	9/21/2003 3:38	1	2048-2049	3:38:40	3:40:12	0:01:32			
Date/Time End Core:	9/21/2003 3:45	2	2049-2050	3:40:12	3:41:16	0:01:04			
Date/Time Start TOH:	9/21/2003 3:57	3	2050-2051	3:41:16	3:42:22	0:01:06			
Date/Time Barrel @ Surface:	9/21/2003 4:07	4	2051-2052	3:42:22	3:43:44	0:01:22			
Core Barrel Trip Time:	0:09:56	5	2052-2053	3:43:44	3:44:44	0:01:00	GT-216	4:17:32	293-11
Fluid Density/Viscosity:	8.9 ppg	6	2053-2054	3:44:44	3:45:33	0:01:09			
Fluid Temp. In (°F):	72.6	7							
Fluid Temp. Out (°F):	72.7	8							
Pump Pressure (psig):	150	9							
Pump Rate (spm/gpm):	16	10							
Weight on Bit (lbs):	3,000	11							
RPM:	78	12							
Group:	Cherokee	13							
Feet Cored:	6.0	14							
Feet Recovered:	10.3	15							
Reservoir Temp (°F):	95.6	16							
Surf. Temp/Press (°F/in-Hg):	64.8 / 28.89	17							
Reservoir Top:	2,050.4	18							
Reservoir Bottom:	2,053.2	19							
Coal Top:	2,051.8	20							
Coal Bottom:	2,052.7								

TICORA GEOSCIENCES, INC.

WIRELINE CORE OPERATIONS

Date: 9/21/2003

CORE RUN: 45

OPERATOR: J.M. Huber Corporation
WELL: Fuqua 10-36-28-9
FIELD/PROSPECT: Wildcat
COUNTY: Elk
STATE: Kansas

LOCATION: 1,987' FSL and 1,945' FEL
SECTION: 36
TOWNSHIP: 28S
RANGE: 9E
ELEV. (FT.): G.L.: 1,202' K.B.: 1,211'
*Datum: KB

OPERATOR: **J.M. Huber Corp.** 1050 17th Street Suite 700 Denver, CO 80265
Mr David May Senior Staff Geoscientist off: (303) 825-7900 fax: (303) 825-8300
Mr. Rod Prosceno Engineer 1614 Cedar View Drive Cody, WY 82414 (307) 587-3489
RIG: **Layne Drilling** (Calgary, Alberta), Rig #232
SERVICE: **Mr. Red McHoes** Wellsite Geologist (307) 752-6362
Schlumberger E-logs Ft. Smith, Arkansas

Date/Time Start Core:	9/21/2003 9:31
Date/Time End Core:	9/21/2003 9:49
Date/Time Start TOH:	9/21/2003 10:01
Date/Time Barrel @ Surface:	9/21/2003 10:11
Core Barrel Trip Time:	0:10:18
Fluid Density/Viscosity:	8.9 ppg
Fluid Temp. In (°F):	73.1
Fluid Temp. Out (°F):	73.9
Pump Pressure (psig):	150
Pump Rate (spm/gpm):	16
Weight on Bit (lbs):	3,000
RPM:	78
Group:	Cherokee
Feet Cored:	10.0
Feet Recovered:	10.2
Reservoir Temp (°F):	97.4
Surf. Temp/Press (°F/in-Hg):	69.7 / 28.90
Reservoir Top:	2,107.7
Reservoir Bottom:	2,109.0
Coal Top:	
Coal Bottom:	

CORE RUN: 45

	Footage	Start (h:mm:s)	End (h:mm:s)	ROP (h:mm:s)	Canister No.	Can Sealed (h:mm:s)	TICORA No.
1	2101-2102	9:31:02	9:32:47	0:01:45			
2	2102-2103	9:32:47	9:34:45	0:01:58			
3	2103 -2104	9:34:45	9:36:32	0:01:47			
4	2104-2105	9:36:32	9:38:07	0:01:35			
5	2105-2106	9:38:07	9:40:03	0:01:56			
6	2106-2107	9:40:03	9:42:01	0:01:58			
7	2107-2108	9:42:01	9:43:51	0:01:50			
8	2108-2109	9:43:51	9:45:36	0:01:45	GT-284	10:21:53	293-12
9	2109-2110	9:45:36	9:47:25	0:01:49			
10	2110-2111	9:47:25	9:49:40	0:02:15			
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

TICORA GEOSCIENCES, INC.

WIRELINE CORE OPERATIONS

Date: 9/21/2003

CORE RUN: 49

OPERATOR: J.M. Huber Corporation
WELL: Fuqua 10-36-28-9
FIELD/PROSPECT: Wildcat
COUNTY: Elk
STATE: Kansas

LOCATION: 1,987' FSL and 1,945' FEL
SECTION: 36
TOWNSHIP: 28S
RANGE: 9E
ELEV. (FT.): G.L.: 1,202' K.B.: 1,211'
*Datum: KB

OPERATOR: **J.M. Huber Corp.** 1050 17th Street Suite 700 Denver, CO 80265
Mr David May Senior Staff Geoscientist off: (303) 825-7900 fax: (303) 825-8300
Mr. Rod Prosceno Engineer 1614 Cedar View Drive Cody, WY 82414 (307) 587-3489
RIG: **Layne Drilling** (Calgary, Alberta), Rig #232
SERVICE: **Mr. Red McHoes** Wellsite Geologist (307) 752-6362
Schlumberger E-logs Ft. Smith, Arkansas

Date/Time Start Core:	9/21/2003 13:01
Date/Time End Core:	9/21/2003 13:11
Date/Time Start TOH:	9/21/2003 13:25
Date/Time Barrel @ Surface:	9/21/2003 13:36
Core Barrel Trip Time:	0:10:38
Fluid Density/Viscosity:	8.9 ppg
Fluid Temp. In (°F):	73.1
Fluid Temp. Out (°F):	73.9
Pump Pressure (psig):	150
Pump Rate (spm/gpm):	16
Weight on Bit (lbs):	3,000
RPM:	78
Group:	Cherokee
Feet Cored:	10.0
Feet Recovered:	4.0
Reservoir Temp (°F):	98.1
Surf. Temp/Press (°F/in-Hg):	70.1 / 28.90
Reservoir Top:	2,144.0
Reservoir Bottom:	2,145.7
Coal Top:	
Coal Bottom:	

CORE RUN: 49

	Footage	Start (h:mm:s)	End (h:mm:s)	ROP (h:mm:s)	Canister No.	Can Sealed (h:mm:s)	TICORA No.
1	2142-2143	13:01:45	13:02:41	0:00:56			
2	2143-2144	13:02:41	13:03:40	0:00:59			
3	2144-2145	13:03:40	13:04:35	0:00:55			
4	2145-2146	13:04:35	13:05:32	0:00:57	GT-298	13:41:35	293-13
5	2146-2147	13:05:32	13:06:34	0:01:02			
6	2147-2148	13:06:34	13:07:26	0:00:52			
7	2148-2149	13:07:26	13:08:25	0:00:59			
8	2149-2150	13:08:25	13:09:19	0:00:54			
9	2150-2151	13:09:19	13:10:14	0:00:55			
10	2151-2152	13:10:14	13:11:30	0:01:16			
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

TICORA GEOSCIENCES, INC.

WIRELINE CORE OPERATIONS

Date: 9/21/2003

CORE RUN: 53

OPERATOR: J.M. Huber Corporation
WELL: Fuqua 10-36-28-9
FIELD/PROSPECT: Wildcat
COUNTY: Elk
STATE: Kansas

LOCATION: 1,987' FSL and 1,945' FEL
SECTION: 36
TOWNSHIP: 28S
RANGE: 9E
ELEV. (FT.): G.L.: 1,202' K.B.: 1,211'
*Datum: KB

OPERATOR: **J.M. Huber Corp.** 1050 17th Street Suite 700 Denver, CO 80265
Mr David May Senior Staff Geoscientist off: (303) 825-7900 fax: (303) 825-8300
Mr. Rod Prosceno Engineer 1614 Cedar View Drive Cody, WY 82414 (307) 587-3489
RIG: **Layne Drilling** (Calgary, Alberta), Rig #232
SERVICE: **Mr. Rod McHoes** Wellsite Geologist (307) 752-6362
Schlumberger E-logs Ft. Smith, Arkansas

Date/Time Start Core:	9/21/2003 15:39
Date/Time End Core:	9/21/2003 15:48
Date/Time Start TOH:	9/21/2003 15:52
Date/Time Barrel @ Surface:	9/21/2003 16:04
Core Barrel Trip Time:	0:11:59
Fluid Density/Viscosity:	8.9 ppg
Fluid Temp. In (°F):	73.1
Fluid Temp. Out (°F):	73.9
Pump Pressure (psig):	150
Pump Rate (spm/gpm):	16
Weight on Bit (lbs):	3,000
RPM:	78
Group:	Cherokee
Feet Cored:	10.3
Feet Recovered:	10.3
Reservoir Temp (°F):	98.5
Surf. Temp/Press (°F/in-Hg):	71.4 / 28.85
Reservoir Top:	2,167.0
Reservoir Bottom:	2,169.9
Coal Top:	
Coal Bottom:	

CORE RUN: 53

	Footage	Start (h:mm:s)	End (h:mm:s)	ROP (h:mm:s)	Canister No.	Can Sealed (h:mm:s)	TICORA No.
1	2163-2164	15:39:48	15:40:46	0:00:58			
2	2164-2165	15:40:46	15:41:35	0:00:49			
3	2165-2166	15:41:35	15:42:27	0:00:52			
4	2166-2167	15:42:27	15:43:22	0:00:55			
5	2167-2168	15:43:22	15:44:18	0:00:56			
6	2168-2169	15:44:18	15:45:08	0:00:50	GT-304	16:33:46	293-14
7	2169-2170	15:45:08	15:45:59	0:00:51			
8	2170-2171	15:45:59	15:46:53	0:00:54			
9	2171-2172	15:46:53	15:47:43	0:00:50			
10	2172-2173	15:47:43	15:48:11	0:00:28			
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

TICORA GEOSCIENCES, INC.

WIRELINE CORE OPERATIONS

Date: 9/21/2003

CORE RUN: 57

OPERATOR: J.M. Huber Corporation
WELL: Fuqua 10-36-28-9
FIELD/PROSPECT: Wildcat
COUNTY: Elk
STATE: Kansas

LOCATION: 1,987' FSL and 1,945' FEL
SECTION: 36
TOWNSHIP: 28S
RANGE: 9E
ELEV. (FT.): G.L.: 1,202' K.B.: 1,211'
*Datum: KB

OPERATOR: **J.M. Huber Corp.** 1050 17th Street Suite 700 Denver, CO 80265
Mr David May Senior Staff Geoscientist off: (303) 825-7900 fax: (303) 825-8300
Mr. Rod Prosceno Engineer 1614 Cedar View Drive Cody, WY 82414 (307) 587-3489
RIG: **Layne Drilling** (Calgary, Alberta), Rig #232
SERVICE: **Mr. Red McHoes** Wellsite Geologist (307) 752-6362
Schlumberger E-logs Ft. Smith, Arkansas

Date/Time Start Core:	9/21/2003 19:06
Date/Time End Core:	9/21/2003 19:18
Date/Time Start TOH:	9/21/2003 19:30
Date/Time Barrel @ Surface:	9/21/2003 19:42
Core Barrel Trip Time:	0:11:15
Fluid Density/Viscosity:	9.0 ppg
Fluid Temp. In (°F):	73.1
Fluid Temp. Out (°F):	73.9
Pump Pressure (psig):	150
Pump Rate (spm/gpm):	16
Weight on Bit (lbs):	3,000
RPM:	78
Group:	Cherokee
Feet Cored:	9.9
Feet Recovered:	10.1
Reservoir Temp (°F):	99.1
Surf. Temp/Press (°F/in-Hg):	60.8 / 28.85
Reservoir Top:	2,196.8
Reservoir Bottom:	2,198.8
Coal Top:	
Coal Bottom:	

CORE RUN: 57

	Footage	Start (h:mm:s)	End (h:mm:s)	ROP (h:mm:s)	Canister No.	Can Sealed (h:mm:s)	TICORA No.
1	2194-2195	19:06:00	19:07:10	0:01:10			
2	2195-2196	19:07:10	19:08:24	0:01:14			
3	2196-2197	19:08:24	19:09:46	0:01:22			
4	2197-2198	19:09:46	19:11:07	0:01:21			
5	2198-2199	19:11:07	19:12:22	0:01:15	GT-312	19:54:10	293-15
6	2199-2200	19:12:22	19:13:26	0:01:04			
7	2200-2201	19:13:26	19:14:36	0:01:10			
8	2201-2202	19:14:36	19:15:57	0:01:21			
9	2202-2203	19:15:57	19:17:13	0:01:16			
10	2203-2204	19:17:13	19:18:30	0:01:17			
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

TICORA GEOSCIENCES, INC.

WIRELINE CORE OPERATIONS

Date: 9/21/2003

CORE RUN: 59

OPERATOR: J.M. Huber Corporation
WELL: Fuqua 10-36-28-9
FIELD/PROSPECT: Wildcat
COUNTY: Elk
STATE: Kansas

LOCATION: 1,987' FSL and 1,945' FEL
SECTION: 36
TOWNSHIP: 28S
RANGE: 9E
ELEV. (FT.): G.L.: 1,202' K.B.: 1,211'
*Datum: KB

OPERATOR: **J.M. Huber Corp.** 1050 17th Street Suite 700 Denver, CO 80265
Mr David May Senior Staff Geoscientist off: (303) 825-7900 fax: (303) 825-8300
Mr. Rod Prosceno Engineer 1614 Cedar View Drive Cody, WY 82414 (307) 587-3489
RIG: **Layne Drilling** (Calgary, Alberta), Rig #232
SERVICE: **Mr. Red McHoes** Wellsite Geologist (307) 752-6362
Schlumberger E-logs Ft. Smith, Arkansas

			CORE RUN: 59						
			Footage (ground level)	Start (h:mm:s)	End (h:mm:s)	ROP (h:mm:s)	Canister No.	Can Sealed (h:mm:s)	TICORA No.
Date/Time Start Core:	9/21/2003 20:38	1	2214-2215	20:38:35	20:39:45	0:01:10			
Date/Time End Core:	9/21/2003 20:49	2	2215-2216	20:39:45	20:40:43	0:00:58	GT-336	21:25:26	293-16
Date/Time Start TOH:	9/21/2003 21:02	3	2216-2217	20:40:43	20:41:53	0:01:10			
Date/Time Barrel @ Surface:	9/21/2003 21:13	4	2217-2218	20:41:53	20:42:59	0:01:06			
Core Barrel Trip Time:	0:10:53	5	2218-2219	20:42:59	20:44:07	0:01:08			
Fluid Density/Viscosity:	9.0 ppg	6	2219-2220	20:44:07	20:45:11	0:01:04			
Fluid Temp. In (°F):	73.1	7	2220-2221	20:45:11	20:46:15	0:01:04			
Fluid Temp. Out (°F):	73.9	8	2221-2222	20:46:15	20:47:17	0:01:02			
Pump Pressure (psig):	150	9	2222-2223	20:47:17	20:48:13	0:00:56	GT-345	21:26:33	293-17
Pump Rate (spm/gpm):	16	10	2223-2224	20:48:13	20:49:00	0:00:47			
Weight on Bit (lbs):	3,000	11							
RPM:	78	12							
Group:	Cherokee	13							
Feet Cored:	10.1	14							
Feet Recovered:	10.1	15							
Reservoir Temp (°F):	99.4	16							
Surf. Temp/Press (°F/in-Hg):	57.2 / 28.85	17							
Reservoir Top:	2,215.2	18							
Reservoir Bottom:	2,216.2	19							
Reservoir Top:	2,222.3	20							
Reservoir Bottom:	2,223.5								

TICORA GEOSCIENCES, INC.

WIRELINE CORE OPERATIONS

Date: 9/21/2003

CORE RUN: 60

OPERATOR: J.M. Huber Corporation
WELL: Fuqua 10-36-28-9
FIELD/PROSPECT: Wildcat
COUNTY: Elk
STATE: Kansas

LOCATION: 1,987' FSL and 1,945' FEL
SECTION: 36
TOWNSHIP: 28S
RANGE: 9E
ELEV. (FT.): G.L.: 1,202' K.B.: 1,211'
*Datum: KB

OPERATOR: **J.M. Huber Corp.** 1050 17th Street Suite 700 Denver, CO 80265
Mr David May Senior Staff Geoscientist off: (303) 825-7900 fax: (303) 825-8300
Mr. Rod Prosceno Engineer 1614 Cedar View Drive Cody, WY 82414 (307) 587-3489
RIG: **Layne Drilling** (Calgary, Alberta), Rig #232
SERVICE: **Mr. Rod McHoes** Wellsite Geologist (307) 752-6362
Schlumberger E-logs Ft. Smith, Arkansas

			CORE RUN: 60						
			Footage (ground level)	Start (h:mm:s)	End (h:mm:s)	ROP (h:mm:s)	Canister No.	Can Sealed (h:mm:s)	TICORA No.
Date/Time Start Core:	9/21/2003 21:22	1	2224-2225	21:22:50	21:23:35	0:00:45			
Date/Time End Core:	9/21/2003 21:30	2	2225-2226	21:23:35	21:24:25	0:00:50			
Date/Time Start TOH:	9/21/2003 21:42	3	2226-2227	21:24:25	21:25:21	0:00:56			
Date/Time Barrel @ Surface:	9/21/2003 21:52	4	2227-2228	21:25:21	21:26:11	0:00:50			
Core Barrel Trip Time:	0:10:30	5	2228-2229	21:26:11	21:26:56	0:00:45	GT-388	22:01:37	293-18
Fluid Density/Viscosity:	9.0 ppg	6	2229-2230	21:26:56	21:27:51	0:00:55			
Fluid Temp. In (°F):	73.1	7	2230-2231	21:27:51	21:28:48	0:00:57			
Fluid Temp. Out (°F):	73.9	8	2231-2232	21:28:48	21:29:33	0:00:45			
Pump Pressure (psig):	150	9	2232-2233	21:29:33	21:30:19	0:00:46			
Pump Rate (spm/gpm):	16	10	2233-2234	21:30:19	21:30:51	0:00:21			
Weight on Bit (lbs):	3,000	11							
RPM:	78	12							
Group:	Cherokee	13							
Feet Cored:	9.9	14							
Feet Recovered:	10.0	15							
Reservoir Temp (°F):	99.4	16							
Surf. Temp/Press (°F/in-Hg):	55.3 / 28.85	17							
Reservoir Top:	2,227.6	18							
Reservoir Bottom:	2,228.8	19							
Reservoir Top:		20							
Reservoir Bottom:									

Appendix iv

Daily Field Reports

Daily Field Report - 1

J.M. Huber Corp.
Fuqua 10-36-28-9

Submitted To: Mr. David May / Heavy Arnold
Submitted By: Randy Laney / Justin Christofferson

Start Time / Date: 07:00 9/19/03
Finish Time / Date: 07:00 9/20/03
Well: Fuqua 10-36-28-9
Surface Location: NW NW SE Sec 36 T28S R9E
GL: 1,202' **KB:** 1,212.0'
County / State: Elk Co., Kansas
Field: Wildcat

Start Depth (coring):	1,723'	**Finish Depth (coring):**	1,825.0'
Total Feet Cored:	102.0' **Rec:** 102.0'	**% Recovered:**	100%
Group:	Marmaton / Cherokee		
Core Diameter:	3.0"	**Drilling Fluid:**	chem mud
Head Space Filler :	produced water – from Dart Operating Co's South Williams Compressor Station- Sec 34 T33S R14E		

Today's Activity: Continue rotary drill to core point. Reached core point of 1,723' at 17:30 hrs 9/19/03. Begin TOOH at 18:00 hrs. Pick up core barrel and trip in hole. Begin Core Run #1 at 23:18 hrs on 3/19. Normal core operations continued to the end of this report period. Last core run was # 11 from 1,820' – 1,825'. Core recovery is very good.

		Depth	Interval				
TICORA Number	**Canister Number**	**Top**	**Bottom**	**Amount of COAL in 1.0' sample**	**Reservoir**	**Calc. Sample Density**	**Bath Temperature**
		(feet)	**(feet)**	**(feet)**		**(gm/cc)**	**(°F)**
293-1	GT-38	1,723.0	1,724.0	0.0	Holdenville	2.56	90.0
293-2	GT-68	1,797.6	1,798.6	0.0	Bandera	2.35	90.0
293-3	GT-138	1,801.8	1,802.8	0.0	Bandera	2.44	90.0

Comments: Three cans of carbonaceous shale were recovered during this report period. Shales were medium to dark greyish black and slightly carbonaceous. Samples were firm and competent and displayed weak visible desorption. No coals were recovered during this report period.

Daily Field Report - 2

J.M. Huber Corp.
Fuqua 10-36-28-9

Submitted To: Mr. David May / Heavy Arnold
Submitted By: Randy Laney / Justin Christofferson

Start Time / Date: 07:00 9/20/03
Finish Time / Date: 07:00 9/21/03
Well: Fuqua 10-36-28-9
Surface Location: NW NW SE Sec 36 T28S R9E
GL: 1,202' **KB:** 1,212.0'
County / State: Elk Co., Kansas
Field: Wildcat

Start Depth (coring):	1,825.0'	**Finish Depth (coring):**	2,076.0'
Total Feet Cored:	251.0' **Rec**: 239.7'	**% Recovered:**	96%
Group:	Marmaton / Cherokee		
Core Diameter:	3.0"	**Drilling Fluid:**	chem mud
Head Space Filler :	produced water – from Dart Operating Co's South Williams Compressor Station- Sec 34 T33S R14E		

Today's Activity: Operations began with Core Run #12 (1,825.0' – 1,835.0'). During Core Run #24, approximately 4.7' feet of core slipped. The slipped core occurred in the Excello / Mulky interval. A retrieval run was made and 3.2 ft. were recovered, and 1.5 ft. were lost. Some of the lost core is presumed to be Mulky Coal. Additionally, Core Run #30 slipped 9.8 ft of core and the retrieval attempt failed (lost 9.8 ft.).

Operations for this report period ended with Core Run # 41.

		Depth	Interval				
TICORA Number	**Canister Number**	**Top**	**Bottom**	**Amount of COAL in 1.0' sample**	**Reservoir**	**Calc. Sample Density**	**Bath Temperature**
		(feet)	**(feet)**	**(feet)**		**(gm/cc)**	**(°F)**
293-4	GT-401	1,865.6	1,866.6	0.8	Mulberry	1.36	95
293-5	GT-370	1,930.4	1,.931.4	0.0	Little Osage Shale	2.13	95
293-6	GT-37	1,949.1	1,950.1	<0.1	Excello Shale	2.31	95
293-7	GT-155	1,951.6	1,951.8	0.2	Mulky Coal	1.55	95
293-8	GT-273	2,018.4	2,019.4	0.0	Bevier	2.33	95
293-9	GT-276	2,019.4	2,020.4	0.5	Bevier	1.55	95
293-10	GT-163	2,043.6	2,044.6	0.0	un-named	2.46	95
293-11	GT-216	2,051.8	2,052.8	0.9	Croweburg	1.78	95

Comments: The first canistered coal of the well occurred from 1,865.8' – 1,866.6' (0.8 ft thick). This coal is believed to be the Mulberry Coal and displayed a greasy to satiny luster with fair face cleat development and was slightly rubblized. Calcite mineralization was noted in

cleats. Visible desorption before canistering was rated as weak.

Canister GT-370 contains a sample of carbonaceous shale from the Little Osage Shale / Summit interval. Canisters GT-37 and GT-155 represent the Excello Shale / Mulky Coal interval. As stated above, core was slipped during the wireline process and up to 1.5 ft. of Mulky Coal could have been lost. The 0.2 ft. recovered was put into Canister GT-155. This coal was fairly low ash and had fair face cleat development.

The Bevier Coal was poorly developed (0.5') and consisted of greasy luster coal with poor face cleat development. Canister GT-273 contains 1.0 ft. of overlying carbonaceous shale. Canister GT-276 contains the 0.5 ft. of Bevier Coal and 0.5 ft. of bounding carbonaceous shale.

The last sample taken during this report period was Canister GT-216 and represents either the Croweburg or Fleming Coal. This canister contains 0.9 ft. of relatively high ash – dull banded coal with poor face cleat development. The coal displayed pyritic streaks throughout and had fair visible desorption before canistering.

Daily Field Report - 3

J.M. Huber Corp.
Fuqua 10-36-28-9

Submitted To: Mr. David May / Heavy Arnold
Submitted By: Randy Laney / Justin Christofferson

Start Time / Date: 07:00 9/21/03 **Finish Time / Date:** 07:00 9/22/03
Well: Fuqua 10-36-28-9
Surface Location: NW NW SE Sec 36 T28S R9E **GL:** 1,202' **KB:** 1,211.0'
County / State: Elk Co., Kansas **Field:** Wildcat

Start Depth (coring):	2,076.0'	**Finish Depth (coring):**	2,254.5 (TD)
Total Feet Cored:	169.5' **Rec:** 154.8'	**% Recovered:**	91%
Group:	Cherokee		
Core Diameter:	3.0"	**Drilling Fluid:**	chem mud
Head Space Filler :	produced water – from Dart Operating Co's South Williams Compressor Station- Sec 34 T33S R14E		

Today's Activity: Operations for this report period began with Core Run # 42. Problems with core slipping from the inner tube during the wireline retrieval process necessitated installing a set of finger grabbers at the top of the core shoe and also replacing several core shoes with new ones. Approximately 5.7 ft of core was slipped on Run #49. This interval coincided with the Weir Coal interval and it is believed some of the Weir reservoir rock was lost. Approximately 10.0 ft of core was slipped on Run #55, 9.0 ft was lost. Coring operations proceed normally until Core Run #62 at which point David May halted the coring operation at a total depth of 2,254.5 ft at 0:30 hrs. (9/22/03) . TICORA personnel will continue to collect desorption reading throughout the reporting period.

Rig operations were halted for approximately 35 minutes (11:25 to 12:00 hrs) due to a severe lightning storm.

		Depth	Interval				
TICORA Number	**Canister Number**	**Top**	**Bottom**	**Amount of COAL in 1.0' sample**	**Reservoir**	**Calc. Sample Density**	**Bath Temperature**
		(feet)	**(feet)**	**(feet)**		**(gm/cc)**	**(°F)**
293-12	GT-284	2,108.0	2,109.0	0.2	Tebo	2.06	95
293-13	GT-298	2,144.7	2,145.7	0.0	Weir	2.56	100
293-14	GT-304	2,167.9	2,168.9	0.0	Rowe	2.48	100
293-15	GT-312	2,197.8	2,198.8	0.0	Neutral	2.35	100
293-16	GT-336	2,215.2	2,216.2	0.4	Riverton	1.66	100
293-17	GT-345	2,222.5	2,223.5	0.7	Riverton	1.70	100
293-18	GT-388	2,227.6	2,228.6	0.0	Riverton Sh	2.19	100

Daily Field Report - 3

J.M. Huber Corp.
Fuqua 10-36-28-9

Comments: The first canister of this report period contains coal (0.2 ft of shaly coal) and carbonaceous shale from the Tebo interval. The coal was high ash with little or no cleat development. The bounding carbonaceous shale displayed pyritic streaks. Visible desorption before canistering was weak.

As stated above, core was slipped while trying to retrieve the Weir interval. Canister GT-298 contains 12 inches of carbonaceous shale from the Weir. This shale was also pyritic and had a trace of visibly desorbing gas.

The Rowe interval consisted of approximately 3.5 feet of carbonaceous shale and Canister GT-304 contains a 12 inch sample of very fissile to flaky carbonaceous shale which displayed a trace of desorbing gas.

Canister GT-312 contains a 12 inch sample of fissile carbonaceous shale which contains pyrite and calcite filled vertical fractures. There was no visible desorption associated with the sample.

The Riverton interval consisted of approximately two carbonaceous shale and coal horizons. Canister GT-336 contains a 12 inch competent sample of 0.4 ft of coal, which contains pyrite filled vertical fractures and nodules along with 0.6 ft of carbonaceous shale, both displayed a trace of desorpting gas. Canister GT-345 contains a competent sample of 0.7 ft. of coal, which contained both pyrite and calcite filled vertical fractures along with 0.3 ft. of carbonaceous shale, only the coal showed visible desorption.

Canister GT-388 contains a 12 inch competent sample of carbonaceous shale which displayed no visible desorption. This sample was located below the Riverton coals.

Appendix v

Table of Circulating Fluid Temperatures

Circulating Fluid Temperatures

J.M. Huber Corp.
Fuqua 10-36-28-9

Circulating Temperature Table – Fuqua 10-36-28-9				
Depth (ft.)	Mud Temp In (^{0}F)	Mud Temp Out (^{0}F)	*Anticipated Reservoir Temp (^{0}F)	Ambient Temp (^{0}F)
1,725	69.6	70.1	90	44.8
1,755	67.8	67.9	90	41.4
1,820	67.5	67.5	90	38.6
1,850	68.7	68.9	90	57.5
1,898	75.1	75.1	90	75.1
1,947	72.5	75.1	95	71.2
1,996	71.8	72.1	95	65.6
2,040	72.6	72.7	95	64.3
2,080	73.1	73.9	95	68.1
2,214	74.0	73.7	100	58.1

Appendix vi

Limestone Show Intervals

Limestone Show Intervals

J.M. Huber Corp.
Fuqua 10-36-28-9

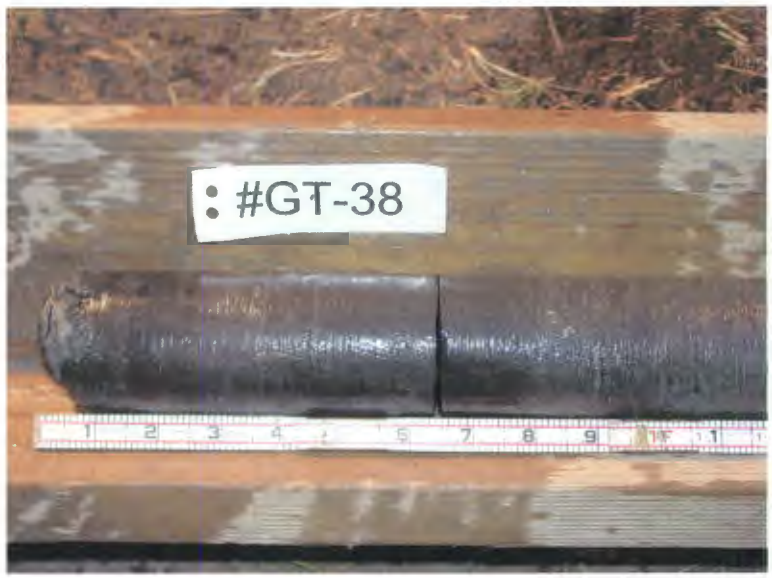
Limestone Show Intervals – Fuqua 10-36-28-9		
Show Depth	**Formation**	**Comments**
(feet)		
1,784.9 – 1,785.6	Altamont	Limestone displayed fair development of pinpoint vugs, had a medium tan to light brown coloration (staining), and displayed a dull gold fluorescence. No hydrocarbon odor was detected.
1,881.2 – 1,883.7	Pawnee	A light to medium brown oil observed to be emanating from vertical fractures and also bleeding from small discreet vugs.
1,891.8 – 1,892.0 1,892.7 – 1,893.9	Pawnee	Limestone intervals display rather even staining due to light brown oil bleeding from rock matrix.
1,917.0 – 1,918.2 1,924.4 – 1,926.5	Higginsville	Even staining to more darker splotchy staining in upper interval- very spotty stain and also emanating from fractures in lower interval.
2,006.2 – 2,006.5	un-named Ls above the Bevier	Small interval bleeding light brown oil.
2,234.9 – 2,241.0	Mississippian	Light brown oil emanating from small vertical fractures and also bleeding from vugs that are lined with euhedral calcite crystals. Very spotty oil staining below this interval to TD.

Appendix vii

Core Report

J.M. Huber Corp.
Fuqua 10-36-28-9
Core Report

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS
1,723.0 – 1,725.5:	Shale-	Shale is a medium greyish black, firm, parts readily in poker chip fashion, very slightly carbonaceous at top, displays some fossil molds. **Canister GT-38** contains the interval from 1,723.0' – 1,724.0' and consists of 12 inches of carbonaceous shale. Trace visibly desorbing gas before canistering. The **Reservoir System Thickness** (RST) is approximated by the canister interval (12 inches).



NOTE: Estimates of **'Reservoir System Thickness' given in this report refers to the full extent of prospective (gas bearing) carbonaceous shale, coaly shale, shaly coal and coal observed when laid down in the core tray. Densities generally range up to 2.1 – 2.2 gm/cm^3, but can occasionally run to higher values.*

1,725.5 – 1,741.1:	Shale-	with minor limestone streaks. Interval is mottled medium to dark grey becoming very dark grey to light blackish grey at base. Generally firm with fairly even partings, becomes soft and crumbly-textured with eroded core surfaces (wash-outs) from 1,738.5' to base. Most shale is moderately calcareous with some thin shaly limestone streaks in upper 2 to 3 inches, non-carbonaceous.
1,741.1 – 1,747.0:	Limestone-	Limestone is off-white to light greyish tan, very fine to extremely finely microcrystalline grain size, moderately firm, scattered small fossil shells throughout. Top and basal parts of interval

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS
		appear somewhat brecciated with medium greenish grey shale found between clasts. Occasional low-angle compound slickensides (slicks) in shaly parts. Interval is tight with no show.
1,747.0 – 1,751.1:	Shale-	Shale is light to medium greenish grey, moderately firm and competent, even horizontal separations, non-to very slightly calcareous, non-carbonaceous.
1,751.1 – 1,753.2:	Limestone-	A shaly limestone, very light grey, very finely microcrystalline, in gradational contact with underlying shale, all tight.
1,753.2 – 1,780.6:	Shale-	Shale ranges in coloration from medium grey to some light greenish grey and begins to pick up faint reddish hues at 1,772.7'. Becomes a light reddish brown shale from 1,777.7' – 1,780.0', last six inches of interval shale is a medium greenish grey. Shale is fairly firm and competent, separates on slightly un-even, sub-horizontal surfaces, occasional medium-angle rough-surfaced slicks, non-carbonaceous throughout.
1,780.6 – 1,784.9:	Ls & Sh-	Interbedded limestone and shale. Upper five inches of interval consists of limestone clasts with some fossil shell (?) material set in a dark grey shaly matrix. Remainder of limestone is off-white, finely crystalline, firm and interbedded with very dark grey shale with partings approaching poker chip quality. Shale is moderately soft and displays eroded core surfaces, especially near base, slightly calcareous, non-carbonaceous.
1,784.9 – 1,790.6:	Limestone-	with some shale. Limestone is light grey to mottled medium tan-grey, firm, mostly microcrystalline. From top of interval to 1,785.6' fair pin-point porosity has developed and limestone displays a medium brownish coloration (or staining). Initially appeared to bleed saltwater and no hydrocarbon odor could be detected, **but a dull gold fluorescence was present.** Remainder of interval is a mottled shaly limestone with some pin-point porosity. The darker mottled coloration could be due to a trace of hydrocarbon staining (as above), but no fluorescence was noted.
1,790.6 – 1,797.2:	Limestone-	This limestone had a light tan-grey to off-white coloration and was veined throughout with irregular, sub-horizontal to low-angle shaly streaks. Small bi-valve shells found throughout. Limestone is firm to moderately hard, upper and lower contacts are gradational, no visible porosity, no show.
1,797.2 – 1,803.4:	Sh & Ls-	Interbedded and gradational sequence of shale and limestone. Shale ranges from medium grey to medium greenish grey to light blackish grey. Shales are somewhat soft and display slightly eroded core surfaces. Sampled intervals are slightly carbonaceous and calcareous. Limestone is very light grey and appears somewhat brecciated and veined with medium greenish grey to dark grey shale. **Canister GT-68** contains the interval from 1,797.6' – 1,798.6' and consists of 0.7 feet of slightly carbonaceous shale and 0.3

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS

feet of overlying dark grey shale. **The RST is approximated by the canistered interval (12 inches).**

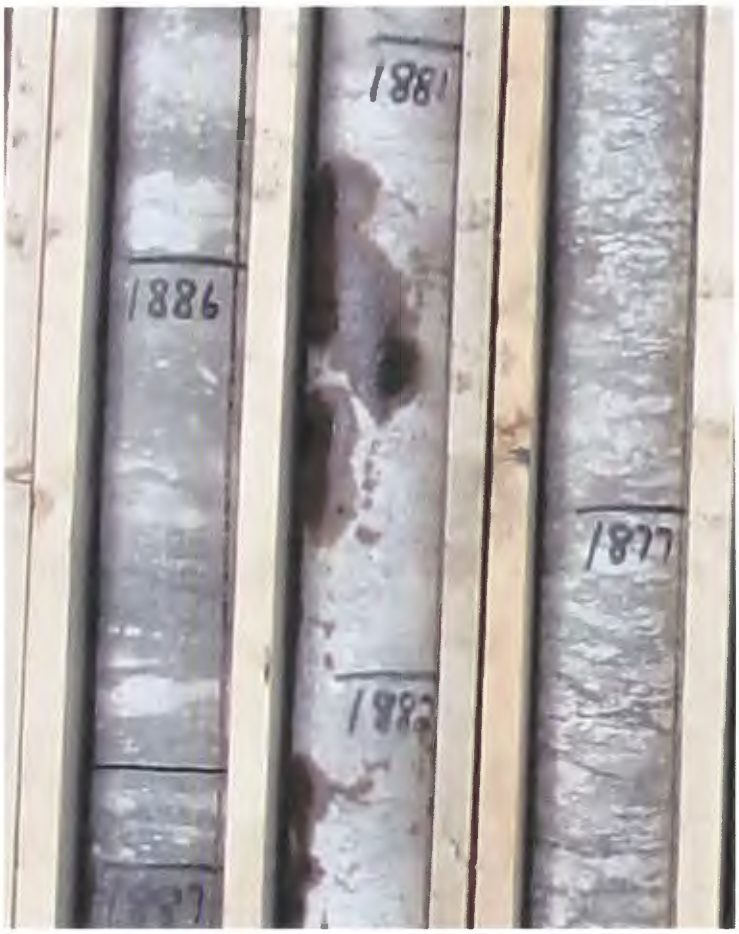
Canister GT-138 contains the interval from 1,801.8' – 1,802.8' and consists of a mixture of slightly carbonaceous and dark grey shale. **The RST of the interval extends from 1,801.5' – 1,802.8'.**

1,803.4 – 1,834.8: Shale-

Shale is medium to dark greenish grey at top and becomes much darker hued to base- light greyish black to medium brownish black, firm and competent with most partings somewhat even and horizontal. Slightly to fairly calcareous at top becoming non-calcareous to base, generally non-carbonaceous. Some natural partings in lower 10 feet of interval display slightly coalified and pyritized plant remains, no visible desorption.

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS
1,834.8 – 1,838.5:	Ss & Sh-	Finely inter-laminated off-white, very fine grained sandstone and dark grey shale- sandstone predominates through interval. Laminae are very thin and somewhat regularly spaced in upper 12 inches, becomes slightly more irregular with sandy lenses developing toward base. Minor soft sediment deformation (SSD) features occur in basal parts, non-calcareous.
1,838.5 – 1,862.7:	Shale-	with minor inter-laminated sandstone. Upper two feet is streaked with stringers and lenses of sand as above. From 1,840.5' to base, some sandy lenses noted but only in minor amounts. Shale is uniformly very dark grey to light blackish grey, firm- all of section is in-gauge core. Shale parts fairly readily in general poker chip fashion, non-carbonaceous and slightly calcareous throughout becoming slightly more so at base.
1,862.7 – 1,865.4:	Limestone-	Limestone has a light tan coloration, microcrystalline, firm and tight, with scattered bi-valve shells throughout.
1,865.4 – 1,866.8:	**Coal** & Sh-	First coal of well. Coal occurs from 1,865.8' – 1,866.6' (0.8 ft) and displays a greasy to satiny luster with face cleat development on 3/8 to 1/2 inch spacing, calcite mineralization observed in cleats. Slightly rubblized at base of coal due to separation along cleats. Small pyritic bands observed near top. Coal is of fair quality and low ash content. Bounding shales are greyish black and calcareous with some fossil hash. **Canister GT-401** contains the interval from 1,865.6' – 1,866.6' and consists of 0.8 ft. of coal and 0.2 ft. of coaly carbonaceous shale. **The RST of the interval extends from 1,865.5' – 1,866.7'.**

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS
1,866.8 – 1,877.8:	Shale-	with limestone interbeds. Coloration ranges from medium greyish brown at top to medium grey at base. Light grey limestone clasts and stringers found throughout interval and increase in frequency to base. In gradational contact with limestone at base.
1,877.8 – 1,885.0:	Limestone-	A relatively clean, light to medium grey limestone with minor shale. Shale occurs as stringers and veinlets oriented sub-horizontally or at low angle with core. Limestone is firm, microcrystalline and slightly fossiliferous. From 1,881.2' to 1,883.7' the limestone displayed **light to medium brown oil emanating from vertical fractures and also bleeding from small discreet vugs.**



1,885.0 – 1,894.6:	Ls & Sh-	Interbedded limestone and shale. Medium to dark grey shale and silty shale predominates in upper four feet of interval. From 1,889.0' to 1,891.8' the lithology is predominately limestone and thinly interbedded limestone and shale. This limestone is more fossiliferous than above with some shell molds displaying euhedral calcite growth. **Limited intervals of light to medium brown bleeding oil: 1,891.8' – 1,892.0' and 1,892.7' – 1,893.9'.**

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS
1,894.6 – 1,910.4:	Shale-	Shale is light greyish brown to medium greyish black and becomes darker hued to almost black from 1,896.3' – 1,897.5'. From 1,897.5' to 1,904.0' the shale is light blackish grey and becomes lighter hued with depth. The basal 14 inches of the interval take on a medium greenish grey color. The shale is firm and becomes slightly carbonaceous with traces of desorbing gas from natural partings in the interval 1,895.3' – 1,897.4' **(RST is equal to 2.1 feet).** Shale at the top of the interval is slightly to moderately calcareous with some fossil shell material (especially from 1,905.4' – 1,906.0') Basal interval parts in poker chip fashion. After core was washed and dried, the interval from 1,906.0' – 1,907.3' displayed a white residue (result of bleeding salt water?)
1,910.4 – 1,927.4:	Limestone-	Limestone is very light grey to off-white, some mottling due to greenish grey shale stringers. Limestone is microcrystalline, somewhat fossiliferous and brecciated from top to 1,915.4'. **Limestone observed to bleed a very light brown oil from 1,917.0' – 1,918.2' and very spotty bleeding oil from 1,924.4' – 1,926.5' (also emanating from one high-angle fracture).**
1,927.4 – 1,936.4:	Shale-	Shale is light greyish brown at top of interval becoming jet black to base. Upper part is firm and sparsely fossiliferous (more so at 1,930.0' – 1,930.2') and calcareous. The interval from 1,930.2' – 1,932.1' is moderately carbonaceous with some slightly calcareous nodules near base, non-pyritic, no visible desorption. **Canister GT-370** contains the interval from 1,930.4' – 1,931.4' and consists of 12 inches of carbonaceous shale. **The RST of the interval is equal to 1.9 ft.**

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS
		The shale from 1,932.1' to base is noticeably lighter hued than above, ranging from dark grey to very light blackish grey, partings are poker chip. Becomes increasingly calcareous and grades to a shaly limestone at base. A thin fossiliferous limestone bed occurs at 1,932.1' – 1,932.3'.
1,936.4 – 1,946.0:	Limestone-	and shaly limestone. Coloration is a mottled off-white to light tan to becoming light greenish grey at base. Upper six inches is somewhat brecciated and veined with dark grey shale. From that point to 1,942.4' the limestone is firm, relatively clean and microcrystalline, no visible porosity. From 1,942.4' to 1,944.1' the limestone is again brecciated with medium grey shale between limestone clasts. The interval from 1,944.1' to base becomes darker hued and increasingly shalier and is in gradational contact with underlying shale. No show or bleeding oil observed.
1,946.0 – 1,950.1:	Shale & **Coal-**	Coloration ranges from medium greyish brown in upper 12 inches to jet black at base. Shale becomes moderately to very carbonaceous and generally firm and competent from 1,947.1' – 1,950.1'. This interval also contains some lighter blackish grey, somewhat oval-shaped nodules scattered throughout. **Canister GT-37** contains the interval from 1,949.1' – 1,950.1' and consists mostly of black carbonaceous shale. At the very base of the sampled interval is a 1/4 inch thick coal seam. This coal occurred at the very bottom of the recovered core run. Core was lost between this point and 1,951.6' and in all likelihood the lost core was composed of Mulky coal.
		
1,950.1 – 1,951.6:	**Lost Core**	
1,951.6 – 1,951.8:	**Coal-**	Retrieved 0.2 feet of rubblized coal from slipped core run. Coal is fairly low ash and had some face cleat development. Visible

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS

desorption before canistering was weak.

Canister GT-155 contains the interval from 1,951.6' – 1,951.8' and consists of 0.2 feet of coal (client requested that only the coal be canistered). **The RST of the interval (including the lost core) extends from 1,947.1' – 1,951.8' (4.9 feet thick)** and is believed to be composed of approximately 1.9 feet of coal and 3.0 feet of carbonaceous shale.

1,951.8 – 1,957.0: Shale- Approximately 5 inches of soft underclay occurs below the Mulky Coal. The remainder of the shale is very dark grey to 1,954.8' then becoming a medium greenish grey shale to base. Majority of shale is soft and flaky to brittle textured and displays an eroded core surface. Upper darker hued parts cut by low-angle, rough-surfaced slicks, shale is non-carbonaceous and generally non-calcareous.

1,957.0 – 1,957.8: Limestone- Limestone is light greyish tan, microcrystalline and firm. Veined with shale at upper contact and becomes gradationally shaly to slightly sandy at base.

1,957.8 – 1,967.3: Sandstone- Sand is a light grey to tannish grey, mostly fine to medium grained, well cemented and firm. From 1,957.8' to 1,959.2' the sand is moderately calcareous and interbedded with light grey shale. Most bedding planes are regularly spaced and at low angle to core. Some soft sediment deformation features (slumping) observed. All of interval is tight, non-fractured, no show.

1,967.3 – 1,996.5: Shale- with interbedded sand and some siltstone. Interval from top to 1,978.0' is moderately sandy to silty but becomes increasingly shalier with depth. Coloration is mostly light to medium hues of grey. As shale becomes less clastic rich, poker chip partings become more common. Shale is non-carbonaceous but with occasional plant debris at natural partings. A high-angle

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS
		fracture occurs between 1,985.0' and 1,987.0'.
1,996.5 – 2,005.3:	**Lost Core**	
2,005.3 – 2,006.0:	Shale-	Recovered shale is rubblized- rounded and re-cored dark grey shale fragments.
2,006.0 – 2,007.2:	Limestone-	Limestone is mottled greenish grey and appears brecciated. Contains greenish grey shale veins and is in gradational contact with underlying shale. **Displays a small interval of light brown bleeding oil from 2,006.2' – 2,006.5'.**
2,007.2 – 2,014.0:	Shale-	Shale is very dark grey to blackish grey, firm and competent, non-calcareous at top becoming slightly calcareous to base. Shale is non-carbonaceous but displays poker chip partings throughout. In gradational contact with underlying shaly limestone.
2,014.0 – 2,016.8:	Limestone-	Predominately a very shaly limestone, mottled greyish tan to dark grey, very firm. Cleaner parts of the limestone contain some fossil shell material. All tight with no show.
2,016.8 – 2,020.4:	Shale and **Coal**-	Shale is greyish black to jet black and becomes increasingly carbonaceous to 2,019.9'. Some fossil shell material scattered throughout. The coal interval extends from 2,119.9' to 2,020.4' (0.5 ft.) and consists of a competent, greasy luster coal with poor face cleat development. **Canister GT-273** contains the interval from 2,018.4' to 2,019.4' and consists of 12 inches of carbonaceous shale.

Canister GT-276 contains the interval from 2,019.4' – 2,020.4' and consists of the entire Bevier Coal seam (0.5 ft thick) along with 0.5 ft of overlying carbonaceous shale. **The RST of the interval extends from 2,018.2' – 2,020.4'**

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS

2,020.4 – 2,031.6: Shale- Shale ranges in coloration from medium blackish grey in upper 12 inches to a very light greenish grey to medium grey at base. Underclay extends from top of interval to 2,021.6'. This part is soft with an eroded core surface. Shale becomes firmer and slightly silty at base. Lower four feet of interval parts on even horizontal surfaces, non-carbonaceous.

2,031.6 – 2,036.1: Silt & Ss- Interbedded shaly siltstone and shaly sandstone. Silt predominates at top of interval with fine grained sand increasing to base. Sandstone is very light grey to off-white, finely laminated with medium grey shale. Soft sediment deformation features common throughout, non-calcareous.

2,036.1 – 2,045.3: Shale- with **very minor coal**. Shale is very dark grey at top becoming medium greyish black to black at base. Shale is moderately soft and flaky-textured and displays very fine laminations of silt and sand. This fine bedding is pronounced due to washing-out of the shale while the thin coarser clastics layers remain in gauge. The interval from 2,042.7' to base is relatively free of silt and sand.

The interval from 2,043.0' – 2,045.2' is slightly carbonaceous and is terminated at base by a one inch thick, dull luster, high-ash coal seam with irregular cleating all calcite-filled. Trace of visible desorption from this coal. The shale from 2,044.6' – 2,045.2' is limy and fossiliferous.

Canister GT-163 contains the interval from 2,043.6' – 2,044.6' and consists of 12 inches of slightly carbonaceous shale. Visible desorption could not be confirmed from shale. **The RST of the interval extends from 2,043.0' – 2,045.2'**

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS

2,045.3 – 2,050.4: Sh- and interbedded shaly siltstone. Shale is medium to dark grey, very firm, slightly calcareous. Interval contains fine interbeds and laminae / lenses of shaly siltstone and very fine grained sand. In gradational contact with underlying shale.

2,050.4 – 2,053.2: Sh & **Coal-** Shale is dark greyish black to black, firm and slightly carbonaceous. Coal has an overall dull luster with some sub vitreous banding, displays some conchoidal fracture and poorly developed face and butt cleats. Most of face cleats are curvilinear with 3/8 to 1/2 inch spacing and calcite filled. The basal 2 to 3 inches of the coal is pyritic. Some weak visible desorption before canistering.

Canister GT-216 contains the interval from 2,051.8' to 2,052.8' and consists of the entire Croweburg seam (0.9 ft. thick) and 0.1 ft. of overlying carbonaceous shale. **The RST of the interval extends from 2050.4' – 2,053.2'.**

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS
		
2,053.2 – 2,068.4:	Shale-	A soft, medium brownish grey underclay exists from 2,053.2' – 2,056.4' and displays a flaky, eroded core surface. The shale from 2,056.4' to base has a medium greenish grey coloration with off-white limestone nodules. Shale becomes medium to dark grey at base- this part is firm and competent and generally non-calcareous.
2,068.4 – 2,071.4:	Sandstone-	Predominately a shaly sandstone, medium greyish brown, fine grained, well cemented and tight. The thin shale interbeds are dark grey. No show.
2,071.4 – 2,076.4:	Shale-	Shale is very dark grey to dull greyish black at base, mostly firm and competent, parts in crude poker chip fashion. From 2,075.7' to 2,076.4' the shale becomes slightly carbonaceous with a fair amount of sandy lenses. Sand is off-white, very fine grained and well cemented. No visible desorption, but a **RST of 0.7 ft** applied to this interval based on carbonaceous content. A medium-angle polished slick occurs at 2,072.8'.
2,076.4 – 2,080.3:	Sand-	and finely laminated sandstone and shale. Sand is very light whitish grey, massively bedded and medium grained in upper 10 inches of interval. This lithology passes into a finely interbedded and then a finely inter-laminated sequence of light whitish grey sand and dark grey shale to base. Bedding planes are very regular and oriented sub-horizontally to core.
2,080.3 – 2,081.2:	Sh, Silt, & **Coal**-	Interval appears to be a **faulted section**. From 2,080.6' to 2,081.0', a pyritic carbonaceous shale veined with siltstone stringers is in near-vertical contact with a greasy luster, shaly coal. Additionally , a moderate-angle slick cuts the interval. The coal displayed weak visible desorption, and secondary calcite mineralization. **The RST of the interval extends from 2,080.3' – 2,080.9'.**

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS
2,081.2 – 2,083.3:	Shale-	Interval is composed of a light greyish brown underclay with a very soft and flaky texture. Displays thin, irregular coaly streaks at 2,082.2', non-calcareous. In gradational contact with underlying shale.
2,083.3 – 2,084.9:	Shale-	Predominately a limy shale with a mottled medium to dark greenish grey coloration, non-carbonaceous. Gradationally passes into underlying sand / shale sequence.
2,084.9 – 2,087.9:	Sandstone-	with shale interbeds. Sandstone is a very light whitish grey, fine grained and well cemented, tight. Sandstone becomes progressively shalier with depth. The interval from 2,086.0' – 2,087.9' is composed of similar sand and dark grey shale finely interbedded and inter-laminated, interval is firm and competent.
2,087.9 – 2,096.0:	Shale-	with sandstone interbeds. Shale is very dark grey to dark greenish grey, firm and non-calcareous. Sand occurs as very thin, regularly-spaced interbeds (less than 1/4 inch thick) and grading to some very fine sandy laminae (less than 1/16 inch thick). Bedding planes are mostly horizontal with some minor SSD (shale drapes around sand lenses).
2,096.0 – 2,097.3:	Sandstone-	Sand is very light whitish grey with irregular dark grey shaly streaks. Most of the sand is medium grained, well cemented, tight, wispy shale laminae highlight common SSD.
2,097.3 – 2,099.4:	Shale-	Shale is medium greyish brown, very soft with flaky texture and appears to be an underclay. No coal is present at the top of the interval and absence could be the result of an erosional relationship with overlying sand. The very upper 1/4 inch of interval is a black carbonaceous shale with a trace of visible desorption, however no RST applied. In gradational contact with underlying shale.
2,099.4 – 2,100.7:	Shale-	This shale is medium greenish grey, firm and competent, non-calcareous and non-carbonaceous.
2,100.7 – 2,105.4:	Sandstone-	with shale interbeds. Sand is light whitish grey and fine grained. Sandstone predominates at top of interval and becomes increasingly shalier and inter-laminated with shale to base. No show and non-fractured. Shale is dark grey to very dark greenish grey and firm.
2,105.4 – 2,109.4:	Shale & Coal-	Shale is very dark grey to blackish grey to jet black- becomes darker hued (black) to base. Most of shale is firm and competent and begins to part in regular poker chip fashion as shale becomes more carbonaceous. The carbonaceous shale gradationally changes to a shaly coal at the bottom of the canistered interval. From 2,109.0' to base the shale becomes rather silty. **Canister GT-284** contains the interval from 2,108.0' to 2,109.0' and consists of 0.8 feet of carbonaceous shale and 0.2 feet of very shaly coal. Visible desorption was weak. **The RST of the**

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS
		interval extends from 2,107.7' – 2,109.0'

2,109.4 – 2,112.0:	Shale-	Interval consists of greyish brown to greenish grey underclay. Shale is soft and flaky-textured, also some with a gummy – pliable texture. Part of shale includes a slightly swelling claystone component, rubblized in part, non-calcareous.
2,112.0 – 2,116.3:	Shale-	Shale is medium to dark greenish grey changing to a medium greyish green at base with some maroon to brick-red mottling (first reddish mottling seen in the Cherokee Group in this well). Shale is non-to very slightly calcareous and contains a minor amount of very finely sandy laminae.
2,116.3 – 2,126.7:	Sandstone-	with minor shaly interbeds. Sand is light whitish grey, very fine to some medium grained, well cemented and tight. Shale is predominately light to medium grey and greenish grey. Some soft shale with eroded core surfaces occurs in the interval 2,120.8' – 2,122.3'. Most bedding planes in sand are regularly spaced and sub-horizontal with core. No fractures and no show.
2,126.7 – 2,145.7:	Shale-	Shale is very dark greenish grey to dark blackish grey. Most of interval is brittle-textured with fairly eroded core surfaces. Although shale is dark hued, it is only marginally carbonaceous and a **RST designation has been applied only to the following intervals: 2,131.0' to 2,132.4' and the basal section (2,144.0' – 2,145.7')** which is believed to be the Weir Seam equivalent (however no coal developed). The lower part of the interval readily parts in poker chip fashion and becomes flaky textured from 2,142.5' – 2,144.2'. **Canister GT-298** contains the interval from 2,144.7' – 2,145.7' and consists of 12 inches of carbonaceous shale with a trace of visible desorption.

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS

2,145.7 – 2,146.8: Shale- Shale is medium greenish grey and is variably sandy with some limy clasts near base.

2,146.8 – 2,152.5: **Lost Core-**

2,152.5 – 2,169.9: Shale- From top of interval to 2,157.9' the shale is medium to dark greenish grey with some brick-red to maroon mottling. Shale is firm, non-calcareous and parts in even horizontal fashion. The shale from 2,157.9' – 2,164.4' does not display reddish mottling but is instead a dark greenish grey to very dark grey, but again firm and competent. Shale becomes slightly sandy from 2,159.3' – 2,159.7'. The shale from 2,164.4' to base becomes increasingly darker hued taking on a greyish black to black coloration.

Canister GT-304 sampled this shale in the interval 2,167.9' – 2,168.9' and consists of 12 inches of carbonaceous shale with a somewhat fissile texture. The RST of the interval extends from 2,167.0' to 2,169.9'.

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS

2,169.9 – 2,170.3: Limestone- Limestone is a medium brown shaly limestone. In erosional contact with underlying shale.

2,170.3 – 2,182.1: Shale- Shale is medium to dark greenish grey and dark grey, minor amount of rusty brown mottling from 2,177.2' – 2,178.2'. Most of interval is moderately firm and competent with some eroded core surfaces. Shale is generally non-calcareous with somewhat even partings.

2,182.1 – 2,185.0: Shale- Upper few inches of interval is a dark greyish black shale passing into a dark greyish brown, soft and flaky-textured underclay (no overlying coaly material observed). Remainder of interval is all rubblized due to slipped and re-cored interval. Rubble is predominately shale.

2,185.0 – 2,193.0: **Lost Core-**

2,193.0 – 2,198.8: Shale- Shale is dark grey to some greyish black, moderately firm with some slight erosion of core surfaces. Becomes increasingly darker hued to base- canistered interval is very slightly carbonaceous.

Canister GT-312 contains the interval from 2,197.8' – 2,198.8' and consists of 12 inches of carbonaceous shale. **The RST of the interval extends from 2,196.8' – 2,198.8'**

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS

2,198.8 – 2,203.0: Shale-

A typical underclay does not occur below canistered interval. This shale sequence is similar to above- becomes progressively darker hued to base. Basal 10 inches is slightly carbonaceous, but no visible desorption. **The RST of the interval extends from 2,202.2' – 2,203.0'.**

2,203.0 – 2,216.2: Shale & **Coal-**

Shale is dark grey to some blackish grey and grey black at base. Rather firm and uniform appearing sequence and generally non-carbonaceous except at very bottom of interval. Shale parts readily in poker chip fashion (1 to 3 inch pieces). The coal is rather gradational from overlying carbonaceous shale, with poor face cleat development. Several vertical fractures cutting the coal (and bounding shale) contained pyrite.

Canister GT-336 contains the interval from 2,215.2' – 2,216.2' and consists of 0.4 feet of coal and 0.6 feet of bounding carbonaceous shale. The RST is approximated by the canister interval (12 inches).

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS

2,216.2 – 2,234.9: Shale & **Coal-**

Shale is very dark grey to some greyish black, variably firm with some erosion of core surfaces, especially from 2,218.2' – 2,220.6' and 2,229.0' – 2,231.7'. Interval is only slightly carbonaceous and those parts were sampled in canisters. A fair number of low to medium-angle polished slicks are present, some with secondary calcite mineralization. The shale from 2,231.8' to base is a mottled brownish green with the basal 14 inches appearing brecciated.

Canister GT-345 contains the interval from 2,222.5' – 2,223.5' and consists of 0.7 feet of satiny to sub-vitreous luster, thinly banded coal with face cleat development on 3/8 to 1/2 inch spacing. High-angle fractures that cut the coal interval contain both pyrite and secondary calcite. Visible desorption before canistering was rated as weak to fair. The 0.3 feet of overlying bounding carbonaceous shale did not appear to be visibly desorbing gas. **The RST of the interval extends from 2,222.3' – 2,223.5'**

INTERVAL (feet)	LITHOLOGY	DESCRIPTION & COMMENTS

Canister GT-388 contains the interval from 2,227.6' to 2,228.6' and consists of 12 inches of carbonaceous shale. Visible desorption from the shale could not be confirmed. **The RST of the interval extends from 2,227.6' – 2,228.8'.**

2,234.9 – 2,255.4: Limestone-

Lithology consists of a shaly limestone that may in part be dolomitic due to the very slow effervescence of the rock in HCl. Coloration is a mottled medium tan to medium greyish brown. Irregular, low-angle shaly stringers are common in the upper part of the unit. Interval is very firm to hard. From the top to 2,241.0', the limestone displayed **a light brown oil emanating from vertical fractures and also bleeding from vugs lined with euhedral calcite.** Some of the vugs are up to 1/2 inch across. From 2,241.0' to base, bleeding oil was much less in evidence. No clean Mississippian limestone was cored.

Core TD =

2,255.4 ft.