Confidentiality Requested: Yes No

KANSAS CORPORATION COMMISSION **OIL & GAS CONSERVATION DIVISION**

1147011

Form ACO-1 August 2013 Form must be Typed Form must be Signed All blanks must be Filled

WELL COMPLETION FORM WELL HISTORY - DESCRIPTION OF WELL & LEASE

OPERATOR: License #	API No. 15					
Name:	Spot Description:					
Address 1:						
Address 2:	Feet from North / South Line of Section					
City: State: Zip:+	Feet from East / West Line of Section					
Contact Person:	Footages Calculated from Nearest Outside Section Corner:					
Phone: ()						
CONTRACTOR: License #	GPS Location: Lat:, Long:					
Name:	(e.g. xx.xxxxx) (e.gxxx.xxxxx)					
Wellsite Geologist:	Datum: NAD27 NAD83 WGS84					
Purchaser:	County:					
Designate Type of Completion:	Lease Name: Well #:					
New Well Re-Entry Workover	Field Name:					
	Producing Formation:					
	Elevation: Ground: Kelly Bushing:					
Gas D&A ENHR SIGW	Total Vertical Depth: Plug Back Total Depth:					
OG GSW Temp. Abd. CM (Coal Bed Methane)	Amount of Surface Pipe Set and Cemented at: Feet					
Cathodic Other (Core, Expl., etc.):	Multiple Stage Cementing Collar Used? Yes No					
If Workover/Re-entry: Old Well Info as follows:	If yes, show depth set: Feet					
Operator:	If Alternate II completion, cement circulated from:					
Well Name:	feet depth to:w/sx cmt.					
Original Comp. Date: Original Total Depth:						
Deepening Re-perf. Conv. to ENHR Conv. to SWD						
Plug Back Conv. to GSW Conv. to Producer	Drilling Fluid Management Plan (Data must be collected from the Reserve Pit)					
Commingled Permit #:	Chloride content: ppm Fluid volume: bbls					
Dual Completion Permit #:	Dewatering method used:					
SWD Permit #:	Location of fluid disposal if hauled offsite:					
ENHR Permit #:						
GSW Permit #:	Operator Name:					
	Lease Name: License #:					
Spud Date or Date Reached TD Completion Date or	Quarter Sec Twp S. R East West					
Recompletion Date Recompletion Date	County: Permit #:					

AFFIDAVIT

I am the affiant and I hereby certify that all requirements of the statutes, rules and regulations promulgated to regulate the oil and gas industry have been fully complied with and the statements herein are complete and correct to the best of my knowledge.

Submitted Electronically

KCC Office Use ONLY						
Confidentiality Requested						
Date:						
Confidential Release Date:						
Wireline Log Received						
Geologist Report Received						
UIC Distribution						
ALT I II III Approved by: Date:						

	Page 1wo 1147011	
Operator Name:	_ Lease Name: Well #:	
Sec TwpS. R East _ West	County:	

INSTRUCTIONS: Show important tops of formations penetrated. Detail all cores. Report all final copies of drill stems tests giving interval tested, time tool open and closed, flowing and shut-in pressures, whether shut-in pressure reached static level, hydrostatic pressures, bottom hole temperature, fluid recovery, and flow rates if gas to surface test, along with final chart(s). Attach extra sheet if more space is needed.

Final Radioactivity Log, Final Logs run to obtain Geophysical Data and Final Electric Logs must be emailed to kcc-well-logs@kcc.ks.gov. Digital electronic log files must be submitted in LAS version 2.0 or newer AND an image file (TIFF or PDF).

) Sheets)	Yes No	L	.og Formation (Top), Depth and Datum			Sample
logical Survey	Yes No	Nam	;		Тор	Datum
Cores Taken Electric Log Run						
				on, etc.		
Size Hole Drilled	Size Casing Set (In O.D.)	Weight Lbs. / Ft.	Setting Depth	Type of Cement	# Sacks Used	Type and Percent Additives
· · ·	ADDITIONAL	CEMENTING / SQL	IEEZE RECORD		· · ·	
Depth Top Bottom	Type of Cement	# Sacks Used		Type and Pe	ercent Additives	
ulic fracturing treatment of	on this well?		Yes	No (If No, skip	o questions 2 and	d 3)
Does the volume of the total base fluid of the hydraulic fracturing treatment exceed 350,000		ceed 350,000 gallons	?Yes	No (If No, skip	question 3)	
ing treatment informatio	n submitted to the chemical o	disclosure registry?	Yes	No (If No, fill o	out Page Three o	of the ACO-1)
PERFORATIO Specify I	ON RECORD - Bridge Plug Footage of Each Interval Perf	s Set/Type forated				Depth
	Sheets) logical Survey Size Hole Drilled Drilled Depth Top Bottom Lic fracturing treatment otal base fluid of the hyc ing treatment informatio PERFORATI	Sheets) logical Survey Yes No Yes No Yes No CASING Report all strings set-co Size Hole Drilled Size Casing Set (In O.D.) ADDITIONAL Depth Top Bottom Top Bottom Ulic fracturing treatment on this well? Dearter of the hydraulic fracturing treatment exing treatment information submitted to the chemical of PERFORATION RECORD - Bridge Plug	Sheets) logical Survey Yes No Yes No Yes No Yes No CASING RECORD Ne Report all strings set-conductor, surface, inte Size Hole Size Casing Weight Drilled Set (In O.D.) Lbs. / Ft. ADDITIONAL CEMENTING / SQU Depth Top Bottom Type of Cement # Sacks Used Ulic fracturing treatment on this well?	Sheets) Image: Sheets) Image: Sheets) logical Survey Yes No Yes No Yes Yes No Yes No Yes No Yes No Size Hole Size Casing Weight Drilled Set (In O.D.) Lbs. / Ft. Depth Image: Depth Type of Cement # Sacks Used Image: Depth Image: Depth Type of Cement # Sacks Used Image: Depth Image: Depth Type of Cement # Sacks Used Image: Depth Image: Depth Type of Cement # Sacks Used Image: Depth Image: Depth Type of Cement # Sacks Used Image: Depth Image: Depth Type of Cement # Sacks Used Image: Depth Image: Depth Type of Cement # Sacks Used Image: Depth Image: Depth Image: Depth Type of Cement # Sacks Used Image: Depth Image: Depth Image: Depth Top Bottom Type of Cement # Sacks Used Image: Depth Image: Depth Image: Depth	Sheets) Image: Control of the system of	Sheets) Image: Construction of the stress of the stres

							(,	
TUBING RECORD:	Siz	ze:	Set At:	Pac	cker At:	Liner F	Run:	No	
Date of First, Resumed	l Product	ion, SWD or ENHF	۲.	Producing Method:	umping	Gas Lift	Other (Explain)		
Estimated Production Per 24 Hours		Oil Bb	ls.	Gas Mcf	Wa	ater	Bbls.	Gas-Oil Ratio	Gravity
DISPOSITION OF GAS:		METHOD OF COMPLET		ETION:		PRODUCTION INTER	RVAL:		
Vented Solo	d 🗌 l	Used on Lease		Open Hole Perf		ly Comp. t ACO-5)	Commingled (Submit ACO-4)		
(If vented, Su	ıbmit ACC)-18.)		Other (Specify)					

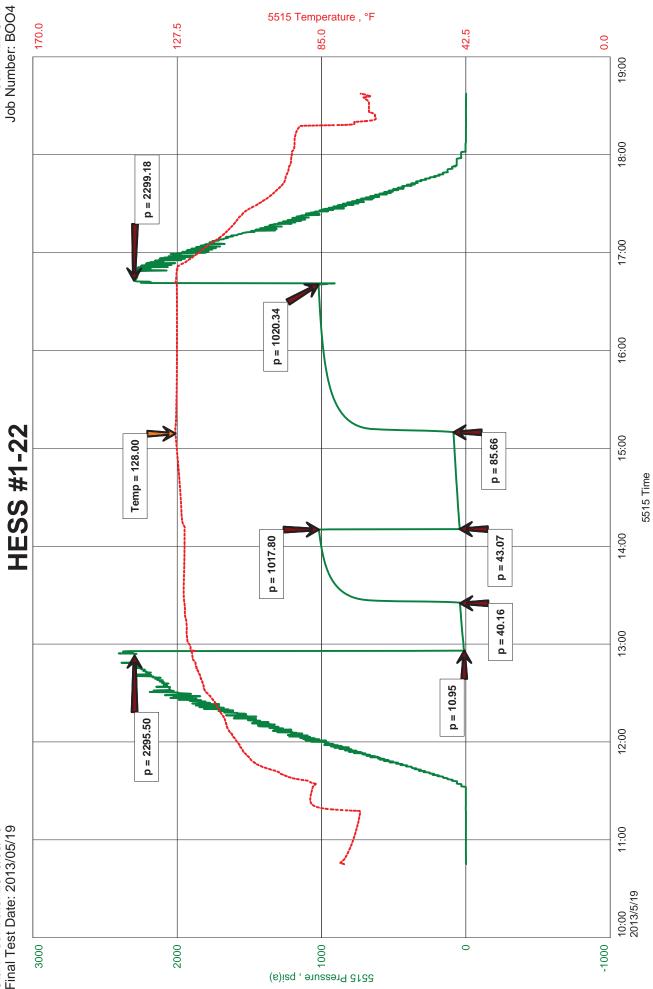
Form	ACO1 - Well Completion
Operator	Grand Mesa Operating Company
Well Name	HESS 1-22
Doc ID	1147011

Tops

Name	Тор	Datum
Bs/Stone Corral	2576	+451
Heebner	4011	-984
Lansing	4054	-1027
Muncie Creek	4200	-1173
Stark	4287	-1260
Marmaton	4380	-1353
Excello	4533	-1506
Mississippian	4659	-1632
LTD	4751	

GRAND MESA OPERATING COMPANY DST #1 JOHNSON 4,585' - 4,626' Start Test Date: 2013/05/19 Final Test Date: 2013/05/19





Tast

DIAMOND TESTING

ROGER D. FRIEDLY

CELL # 620-793-2043

General Information

Company Name	GRAND MESA OPERATING COMPANY		
Contact	STEVE STRIBLING	Job Number	BOO4
Well Name	HESS #1-22	Representative	BOB HAMEL
Unique Well ID	DST #1 JOHNSON 4,585' - 4,626'	Well Operator	GRAND MESA OPERATING COMPANY
Surface Location	SEC 22-12S-32W LOGAN CO., KS	Prepared By	BOB HAMEL
Field	WILDCAT	Qualified By	JOHN GOLDSMITH
Well Type	Vertical	Test Unit	NO.6
Test Information			
		Representative	BOB HAMEL
Test Type	CONVENTIONAL	Well Operator	GRAND MESA OPERATING COMPANY
Formation	DST #1 JOHNSON 4,585' - 4,626'	Report Date	2013/05/19
Well Fluid Type	01 Oil	Prepared By	BOB HAMEL
Test Purpose (AE	UB) Initial Test	-	

Start Test Date Final Test Date 2013/05/19 Start Test Time 2013/05/19 Final Test Time 10:45:00

Test Results

RECOVERED:	16' OCWM	6% OIL, 20% WTR, 74% MUD
	16' SLTWCMO	98% OIL, 1% WTR, 1% MUD
	126' SLTO&MCW	1% OIL, 79% WTR, 20% MUD
	158' TOTAL FLUI	D

TOOL SAMPLE: 2% GAS, 18% OIL, 45% WTR, 35% MUD

CHLORIDES: 32,000Ppm PH: 7.0 RW: .21 @ 68 deg



DIAMOND TESTING P.O. Box 157 HOISINGTON, KANSAS 67544 (800) 542-7313 DRILL-STEM TEST TICKET Ell F: bess1-22dst1

TIME ON: 10:45

TIME OFF: 18:38

	FIL	E. nessi-4	220511						
Company GRAND MESA OPER	RATING COMP	PANY	_Lease & Well No	HESS #1-22					
Contractor DUKE RIG #4			Charge to GRANE	D MESA OPERAT	ING C	OMPANY	·		
Elevation 3,027' KB Forma	tion	JOHNSO	Effective Pay		Ft	. Ticket	No	B004	
Date 5-19-2013 Sec. 22	Twp							KANSA	S
Test Approved By JOHN GOLDSMITH			_ Diamond Representa	ative	B	OB HAM	1EL		
Formation Test No. 1 Ir	nterval Tested from	4,5	85 ft. to	4,626 ft. то	tal Der	oth		4,626 ft	ł.
Packer Depth 4,580 ft.	=				1			in.	
Packer Depth 4,585 ft.			Packer depth					in.	
Depth of Selective Zone Set									
Top Recorder Depth (Inside)	4	,566 _{ft.}	Recorder Number	551	3 Cap).	5,00	0 P.S.I.	
Bottom Recorder Depth (Outside)	4	,623 _{ft.}	Recorder Number	624	19 Ca	p	4,95	0 P.S.I.	
Below Straddle Recorder Depth		ft.	Recorder Number						
Mud Type CHEMICAL Viscosi			Drill Collar Length		0_ft.	I.D	2 1/	4	in.
Weight 9.4 Water Loss	7.2	CC.	Weight Pipe Lengt	h	0_ _{ft.}	I.D	2 7/	8	in
Chlorides			Drill Pipe Length			I.D	3 1/	2	in
Jars: Make STERLING Serial Nu	mber#	6	Test Tool Length_	3	3 _{ft.}	Tool Siz	e3_1/	2-IF	in
Did Well Flow? NO Rev	ersed Out	NO	Anchor Length	4	1_ft.	Size	4 1/	2-FH	_ ir
Main Hole Size 7 7/8 Too	Joint Size 4 1/2	2 XH_in.	Surface Choke Siz	re1	_in.	Bottom	Choke Siz	ze_ 5/8	in
Blow: 1st Open: WEAK 1/2" BLO	W INCREASI	NG TO	6 1/2"				٩)	IObb)	
2nd Open: WEAK SURFACE	BLOW AFTE	R 7 MIN	. INCREASING	G TO 8"			(N	Obb)	
Recovered 16 ft. of OCWM 6%	OIL, 20% WTR, 749	% MUD							
Recovered 16 ft. of SLTWCMO	98% OIL, 1% WTR	, 1% MUD	GRAVITY 25.8 @ (60 deg					
Recovered 126 ft. of SLTO&MC	W 1% OIL, 79% \	<i>N</i> TR, 20%	MUD						
Recovered 158 ft. of TOTAL FL	JID	CHLOR	RIDES 32,000 Pp	m					
Recoveredft. of		PH 7.0			Price	e Job			
Recoveredft. of		RW .2	1@ 68 deg		Othe	er Charge	es		
Remarks:					Insu	rance			
									_
TOOL SAMPLE: 2% GAS, 18% OIL, 4		ID			Tota	1			
Time Set Packer(s) 12:56 P.M.	A.M. _P.M. Time Sta	arted Off Bo	ttom4:41 P.N	И. <u>Р.М.</u> Ма	aximum	n Temper	rature	128	
Initial Hydrostatic Pressure			(A)	2,296 P.S.I.					
Initial Flow Period	Minutes	30	(B)	11_P.S.I. t	to (C)_		40	P.S.I.	
Initial Closed In Period	Minutes	45	(D)	1,018 P.S.I.					
Final Flow Period	Minutes	60	(E)	43 P.S.I. t	o (F)		86 _F	9.S.I.	
Final Closed In Period	Minutes	90	(G)	1,020 P.S.I.					
Final Hydrostatic Pressure			(H)	2,299 _{P.S.I.}					

Diamond Testing shall not be liable for damages of any kind to the property or personnel of the one for whom a test is made or for any loss suffered or sustained, directly or indirectly, through the use of its equipment, or its statement or opinion concerning the result of any test. Tools lost or damaged in the hole shall be paid for at cost by the party for whom the test is made.

258764

FIELD TICKET & TREATMENT REPORT

TICKET NUMBER_	<u>39915</u>
	KIEVKS
FOREMAN Ke	Iv babel

PO	Box	884,	Cha	nute,	KS	66720	
620	-431	-9210	or	800-	467-	8676	

CONSOLIDATED Cit Vial Barrison, LLC

PO Box 884, Chanute, KS 6672 620-431-9210 or 800-467-8676		CEMEN	Г			KS
DATE CUSTOMER #	WELL NAME & NUM	BER	SECTION	TOWNSHIP	RANGE	COUNTY
	Hess 1-27	2	22	12	32	Logen
<u>5-13-13 3372</u> CUSTOMER <u>Grana M</u> MAILING ADDRESS	८५५	Octer southte uterd Yuw	-166	DRIVER Jelly Joidgn	TRUCK#	
CITY	STATE ZIP CODE	NIMO		Jack		<u> </u>
CASING DEPTH 225 SLURRY WEIGHT 125	1+5 13061 u	TUBING WATER gal/s MIX PSI ged 4 Dm 39	pond bcc 2°	CEMENT LEFT IN RATE	other casing 30	orest
Approx 5.661	to pit				Stally	enk bis

ACCOUNT	QUANITY or UNITS	DESCRIPTION of SERVICES or PRODUCT	UNIT PRICE	TOTAL
		PUMP CHARGE	11500	1150 00-
54015		MILEAGE	535	5250
5400	10	C1955 A cement	1855	306075
11045	165	Calcium chloride	. 94	4376
1102	人165年 15年	O and the contraction of the con	.27	8320
11188		Bentonite		·
			175	4/3000
5407	7.75	Ton milegge delivery		1
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├ ─ ───┼				46924
<u> </u>			SALES TAX	+ 201.42
Revin 3737		 ·	TOTAL	4944.00
	Righ Wheel	איד	DATE 5-1	3-13
AUTHORIZTION	Kop Wheels			

I acknowledge that the payment terms, unless specifically amended in writing on the front of the form or in the customer's account records, at our office, and conditions of service on the back of this form are in effect for services identified on this form.

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CUIISO	iluaiou

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	CONSOLIDATED OIL Well Services, LLC
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2	58	98	\$4
0	\mathcal{I}	10	' (

	39983
LOCATION OAKLE	x 195
FOREMAN THURS	

PO Box 884, Chanute, KS 66720 620-431-9210 or 800-467-8676

FIELD T	ICKET	&	TREATMENT	REPORT
		C	EMENT	

620-431-9210 or 800-467-867	76	CEMENT	•.			k -
DATE CUSTOMER #	WELL NAME & NU	MBER	SECTION	TOWNSHIP	RANGE	COUNTY
5.20.13 3372	Hess 1-22		: 22	12	32	LOSAN
CUSTOMER		OLUPY				
GLAND MESA	Operating	S-UTE	TRUCK #	DRIVER	TRUCK #	DRIVER
MAILING ADDRESS		rd	463	Lory D		
		^{[1} 4 ₂ [529	To idan L	· · · · · · · · · · · · · · · · · · ·	
CITY	STATE ZIP CODE] v.~				
JOB TYPE PTA	 HOLE SIZE/8		4750'	CASING SIZE & W	/EIGHT	<u> </u>
	DRILL PIPE 4172			_	OTHER	
SLURRY WEIGHT 14,1	SLURRY VOL 1. 4 2	_ WATER gai/sk		CEMENT LEFT in		••
	DISPLACEMENT PSI	MIX PSI		RATE		· · · · · · · · · · · · · · · · · · ·
REMARKS: GAS dy my	reting on Dubr	· # 4 12	X C U D K	nd plus a	5 ord.	eird
25985 @ 25				•		
1005K5 @ 17	50 (6	LOSSES	60/40 00	< 49000	(1/4+ Slos
40 5KS @ 1	15					
105K5 @	Ho' w/plug	74			-	
305KS R+						
			· · · · · · · · · · · · · · · · · · ·		*	

Thanks Fundy + Crow

	QUANITY or UNITS		UNIT PRICE	TOTAL
54050	1	PUMP CHARGE	139500	1395 00
5406	10	MILEAGE	335	5250
5407	8.8.4000	Tow mileage Delivery (min)	125	43000
1(3)	205545	60140 005	15 36	325130
11185	705=	Bendonite	.27	19035
1107	5(*	Sloscal	297	151 42
4432	<u> </u>	8518 wood cup plug	10025	100 75
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		5.54044		5571.37
		1455 1070		557.14
		50640721		5014.23
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Ravin 3737			SALES TAX ESTIMATED	259.31
Havin 3/3/	$\gamma \wedge \wedge \gamma$		TOTAL	5273.54
AUTHORIZTION	Tich Jetkeel	TITLE / Pa	DATE	

I acknowledge that the payment terms, unless specifically amended in writing on the front of the form or in the customer's account records, at our office, and conditions of service on the back of this form are in effect for services identified on this form.

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Conservation Division Finney State Office Building 130 S. Market, Rm. 2078 Wichita, KS 67202-3802



Phone: 316-337-6200 Fax: 316-337-6211 http://kcc.ks.gov/

Mark Sievers, Chairman Thomas E. Wright, Commissioner Shari Feist Albrecht, Commissioner Sam Brownback, Governor

June 12, 2013

Michael J. Reilly Grand Mesa Operating Company 1700 N WATERFRONT PKWY BLDG 600 WICHITA, KS 67206-5514

Re: ACO1 API 15-109-21176-00-00 HESS 1-22 SE/4 Sec.22-12S-32W Logan County, Kansas

Dear Production Department:

We are herewith requesting that the Well Completion Form ACO-1 and attached information for the subject well be held confidential for a period of two years.

Should you have any questions or need additional information regarding subject well, please contact our office.

Respectfully, Michael J. Reilly

()) () () () () () () () () (. .	
	John Goldsmitl	n weilsite	Service	
c	Cell and Home Phone:	42	7 Roosevelt St.	
з	16-640-0236	Ch	neney, KS 67025	
	Scale 1:240	(5"=100') Imperial		
		ed Depth Log		
	#1-22 Hess			
	1803' FSL, 1045' FEL, SE	CTION 22-12S-32W,		Lawan Caunta
	API: 15-109-21176 05/13/2013	Dri	illing Completed:	Logan County
Surface Coordinates:			ining completed.	03/20/2013
	LONG -100.8542230			
Bottom Hole Coordinates:	Vertical hole			
Ground Elevation (ft):		K.B. Elevation (ft):		
Logged Interval (ft):		Total Depth (ft):	4750'	
Formation: Type of Drilling Fluid:	Mississippian at RTD			
Type of Drining Fluid.		LOG from WellSight	Systems 1-800-44	7-1534 www.WellSight.com
1	OF	ERATOR		
Company	Grand Mesa Operating Co	mpany		
	1700 N. Waterfront Parkw			
	Wichita, KS 67206-5514	.,,		
	(316) 265-3000			
	<u> </u>	OLOGIST		
		OLOGIST		
	John Goldsmith			
	John Goldsmith Wellsite	Service		
Address:	427 Roosevelt St.			
	Cheney, KS 67025 316-640-0236			
	510-040-0250			
	сс	MMENTS		
Contractor: Duke Drilling R		MMENTS		
Contractor: Duke Drilling R Pusher: Rich Wheeler		MMENTS		
	lig #4	MMENTS		
Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro	lig #4			
Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro Mud by: MudCo	ig #4 8 5/8" set at 224' duction casing installed, w			
Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro Mud by: MudCo DST's by: Diamond Testing	ig #4 8 5/8" set at 224' duction casing installed, we	əll was plugged.		
Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro Mud by: MudCo DST's by: Diamond Testing Logs by: Weatherford Log	ig #4 8 5/8" set at 224' duction casing installed, w	əll was plugged.		
Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro Mud by: MudCo DST's by: Diamond Testing	ig #4 8 5/8" set at 224' duction casing installed, we	əll was plugged.		
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Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro Mud by: MudCo DST's by: Diamond Testing Logs by: Weatherford Log RTD=4750'	ig #4 8 5/8" set at 224' duction casing installed, wo g ging Services (DIL, CN-CD,	əll was plugged. ML)		
Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro Mud by: MudCo DST's by: Diamond Testing Logs by: Weatherford Log RTD=4750' LTD=4751'	ig #4 8 5/8" set at 224' duction casing installed, we g ging Services (DIL, CN-CD,	ell was plugged. ML) TION TOPS		
Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro Mud by: MudCo DST's by: Diamond Testing Logs by: Weatherford Log RTD=4750'	ig #4 8 5/8" set at 224' duction casing installed, w g ging Services (DIL, CN-CD, FORMA SAMPLI	ell was plugged. ML) TION TOPS E TOPS	LOG TOPS	
Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro Mud by: MudCo DST's by: Diamond Testing Logs by: Weatherford Log RTD=4750' LTD=4751'	ig #4 8 5/8" set at 224' duction casing installed, w g ging Services (DIL, CN-CD, FORMA SAMPLI	ell was plugged. ML) TION TOPS	LOG TOPS Depth Datu	m
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Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro Mud by: MudCo DST's by: Diamond Testing Logs by: Weatherford Log RTD=4750' LTD=4751'	ig #4 8 5/8" set at 224' duction casing installed, wo g ging Services (DIL, CN-CD, FORMA SAMPLI Depth	ell was plugged. ML) TION TOPS E TOPS Datum	Depth Datu	m
Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro Mud by: MudCo DST's by: Diamond Testing Logs by: Weatherford Log RTD=4750' LTD=4751' FORMATION Heebner Shal	ig #4 8 5/8" set at 224' duction casing installed, we giging Services (DIL, CN-CD, FORMA SAMPLI Depth e 4010'	ell was plugged. ML) TION TOPS E TOPS Datum -983	Depth Datu 4011' -984	
Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro Mud by: MudCo DST's by: Diamond Testing Logs by: Weatherford Log RTD=4750' LTD=4751'	ig #4 is 5/8" set at 224' duction casing installed, we g ging Services (DIL, CN-CD, FORMA SAMPLI Depth e 4010' 4053'	ell was plugged. ML) TION TOPS E TOPS Datum	Depth Datu 4011' -984 4054' -1021	7
Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro Mud by: MudCo DST's by: Diamond Testing Logs by: Weatherford Log RTD=4750' LTD=4751' FORMATION Heebner Shal Lansing	ig #4 is 5/8" set at 224' duction casing installed, we g ging Services (DIL, CN-CD, FORMA SAMPLI Depth e 4010' 4053'	ell was plugged. ML) TION TOPS E TOPS Datum -983 -1026	Depth Datu 4011' -984 4054' -1021	7
Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro Mud by: MudCo DST's by: Diamond Testing Logs by: Weatherford Log RTD=4750' LTD=4751' FORMATION Heebner Shal Lansing Muncie Creek	ig #4 8 5/8" set at 224' duction casing installed, we ging Services (DIL, CN-CD, FORMA SAMPLI Depth e 4010' 4053' Shale 4199' 4287'	ell was plugged. ML) TION TOPS E TOPS Datum -983 -1026 -1172	Depth Datu 4011' -984 4054' -1021 4200' -1173	7 3
Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro Mud by: MudCo DST's by: Diamond Testing Logs by: Weatherford Log RTD=4750' LTD=4751' FORMATION Heebner Shal Lansing Muncie Creek Stark Shale	ig #4 8 5/8" set at 224' duction casing installed, we ging Services (DIL, CN-CD, FORMA SAMPLI Depth e 4010' 4053' Shale 4199' 4287'	ell was plugged. ML) TION TOPS E TOPS Datum -983 -1026 -1172 -1260	Depth Datu 4011' -984 4054' -1027 4200' -1173 4287' -1260	7 3 0 4
Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro- Mud by: MudCo DST's by: Diamond Testing Logs by: Weatherford Log RTD=4750' LTD=4751' FORMATION Heebner Shal Lansing Muncie Creek Stark Shale Hushpuckney Base of KC Marmaton	iig #4 8 5/8" set at 224' duction casing installed, we ging Services (DIL, CN-CD, FORMA SAMPLI Depth e 4010' 4053' Shale 4199' 4287' y Shale 4320' 4337' 4380'	ell was plugged. ML) TION TOPS E TOPS Datum -983 -1026 -1172 -1260 -1293 -1310 -1353	Depth Datu 4011' -984 4054' -102' 4200' -117' 4287' -126' 4338' -131' 4380' -135'	7 3 0 4 1 3
Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro Mud by: MudCo DST's by: Diamond Testing Logs by: Weatherford Log RTD=4750' LTD=4751' FORMATION Heebner Shal Lansing Muncie Creek Stark Shale Hushpuckney Base of KC Marmaton Pawnee	ig #4 8 5/8" set at 224' duction casing installed, we ging Services (DIL, CN-CD, FORMA SAMPLI Depth e 4010' (Shale 4053' (Shale 4199' 4287' (Shale 4320' 4337' 4380' 4448'	ell was plugged. ML) TION TOPS E TOPS Datum -983 -1026 -1172 -1260 -1293 -1310 -1353 -1421	Depth Datu 4011' -984 4054' -102' 4200' -117' 4287' -126(4321' -129' 4380' -135' 4449' -142'	7 3 0 4 1 3 2
Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro Mud by: MudCo DST's by: Diamond Testing Logs by: Weatherford Log RTD=4750' LTD=4751' FORMATION Heebner Shal Lansing Muncie Creek Stark Shale Hushpuckney Base of KC Marmaton Pawnee Little Osage S	ig #4 8 5/8" set at 224' rduction casing installed, we ging Services (DIL, CN-CD, FORMA SAMPLI Depth e 4010' 4053' Shale 4199' 4287' y Shale 4320' 4337' 4380' 448' Shale 4507'	ell was plugged. ML) TION TOPS E TOPS Datum -983 -1026 -1172 -1260 -1293 -1310 -1353 -1310 -1353 -1421 -1480	Depth Datu 4011' -984 4054' -102' 4200' -1173 4287' -1260 4321' -1294 4380' -1353 4449' -1422 4507' -1480	7 3 0 4 1 3 2 0
Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro- Mud by: MudCo DST's by: Diamond Testing Logs by: Weatherford Log RTD=4750' LTD=4751' FORMATION Heebner Shal Lansing Muncie Creek Stark Shale Hushpuckney Base of KC Marmaton Pawnee Little Osage S Excello Shale	ig #4 8 5/8" set at 224' iduction casing installed, we ging Services (DIL, CN-CD, FORMA SAMPLI Depth e 4010' 4053' Shale 4199' 4287' y Shale 4320' 4337' 4380' 448' Shale 4507' 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	ell was plugged. ML) TION TOPS E TOPS Datum -983 -1026 -1172 -1260 -1293 -1310 -1353 -1421 -1480 -1506	Depth Datu 4011' -984 4054' -1027 4200' -1177 4287' -1260 4321' -1294 4338' -1317 4380' -1353' 4449' -1422' 4507' -1488 4533' -1500'	7 3 0 4 1 3 2 2 0
Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro- Mud by: MudCo DST's by: Diamond Testing Logs by: Weatherford Log RTD=4750' LTD=4751' FORMATION Heebner Shal Lansing Muncie Creek Stark Shale Hushpuckney Base of KC Marmaton Pawnee Little Osage S Excello Shale Johnson Zon	iig #4 is 5/8" set at 224' duction casing installed, we ging Services (DIL, CN-CD, FORMA SAMPLI Depth e 4010' 4053' Shale 4199' 4287' 4320' 4337' 4380' 4448' Shale 4507' 4533' e 4608'	ell was plugged. ML) TION TOPS E TOPS Datum -983 -1026 -1172 -1260 -1293 -1310 -1353 -1421 -1353 -1421 -1480 -1506 -1581	Depth Datu 4011' -984 4054' -102' 4200' -117' 4287' -126' 4338' -131' 4380' -135' 4449' -142' 4533' -150' 4608' -158'	7 3 0 4 1 3 2 0 5 5
Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro- Mud by: MudCo DST's by: Diamond Testing Logs by: Weatherford Log RTD=4750' LTD=4751' FORMATION Heebner Shal Lansing Muncie Creek Stark Shale Hushpuckney Base of KC Marmaton Pawnee Little Osage S Excello Shale Johnson Zon Morrow	ig #4 8 5/8" set at 224' duction casing installed, we ging Services (DIL, CN-CD, FORMA SAMPLI Depth e 4010' Shale 4199' 4287' y Shale 4320' 4337' 4380' 4448' Shale 4507' e 4608' e 4608' 608'	ell was plugged. ML) TION TOPS E TOPS Datum -983 -1026 -1172 -1260 -1293 -1310 -1353 -1353 -1421 -1480 -1506 -1581 -1581 -1614	Depth Datu 4011' -984 4054' -102' 4200' -117' 4287' -126' 4338' -131' 4380' -135' 4449' -142' 4507' -148' 4533' -158' 4642' -161'	7 3 0 4 1 3 2 0 5
Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro Mud by: MudCo DST's by: Diamond Testing Logs by: Weatherford Log RTD=4750' LTD=4751' FORMATION Heebner Shal Lansing Muncie Creek Stark Shale Hushpuckney Base of KC Marmaton Pawnee Little Osage S Excello Shale Johnson Zon Morrow	ig #4 8 5/8" set at 224' duction casing installed, we ging Services (DIL, CN-CD, FORMA SAMPLI Depth e 4010' 4053' Shale 4199' 4287' y Shale 4320' 4380' 4380' 4448' Shale 4507' 6 4608' 4608'	ell was plugged. ML) TION TOPS E TOPS Datum -983 -1026 -1172 -1260 -1293 -1310 -1353 -1310 -1353 -1421 -1480 -1566 -1581 -1581 -1614 -1631	Depth Datu 4011' -984 4054' -102' 4200' -117' 4287' -126' 4338' -131' 4380' -135' 4449' -142' 4533' -150' 4608' -158'	7 3 0 4 1 3 2 0 5
Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro Mud by: MudCo DST's by: Diamond Testing Logs by: Weatherford Log RTD=4750' LTD=4751' FORMATION Heebner Shal Lansing Muncie Creek Stark Shale Hushpuckney Base of KC Marmaton Pawnee Little Osage S Excello Shale Johnson Zon Morrow Mississippian RTD	ig #4 8 5/8" set at 224' duction casing installed, we ging Services (DIL, CN-CD, FORMA SAMPLI Depth e 4010' Shale 4199' 4287' y Shale 4320' 4337' 4380' 4448' Shale 4507' e 4608' e 4608' 608'	ell was plugged. ML) TION TOPS E TOPS Datum -983 -1026 -1172 -1260 -1293 -1310 -1353 -1353 -1421 -1480 -1506 -1581 -1581 -1614	Depth Datu 4011' -984 4054' -102' 4200' -117' 4287' -1260 4321' -1294 4380' -135' 4449' -1422 4507' -1480 4533' -1500 4608' -158' 4642' -1613' 4659' -1632'	7 3 0 4 1 3 2 2 0 5 1 5 2
Pusher: Rich Wheeler Surface Casing: 5 joints of Production Casing: No pro Mud by: MudCo DST's by: Diamond Testing Logs by: Weatherford Log RTD=4750' LTD=4751' FORMATION Heebner Shal Lansing Muncie Creek Stark Shale Hushpuckney Base of KC Marmaton Pawnee Little Osage S Excello Shale Johnson Zon Morrow	ig #4 8 5/8" set at 224' duction casing installed, we ging Services (DIL, CN-CD, FORMA SAMPLI Depth e 4010' 4053' Shale 4199' 4287' y Shale 4320' 4380' 4380' 4448' Shale 4507' 6 4608' 4608'	ell was plugged. ML) TION TOPS E TOPS Datum -983 -1026 -1172 -1260 -1293 -1310 -1353 -1310 -1353 -1421 -1480 -1566 -1581 -1581 -1614 -1631	Depth Datu 4011' -984 4054' -102' 4200' -117' 4287' -126' 4338' -131' 4380' -135' 4449' -142' 4507' -148' 4533' -158' 4642' -161'	7 3 0 4 1 3 2 2 0 5 1 5 2

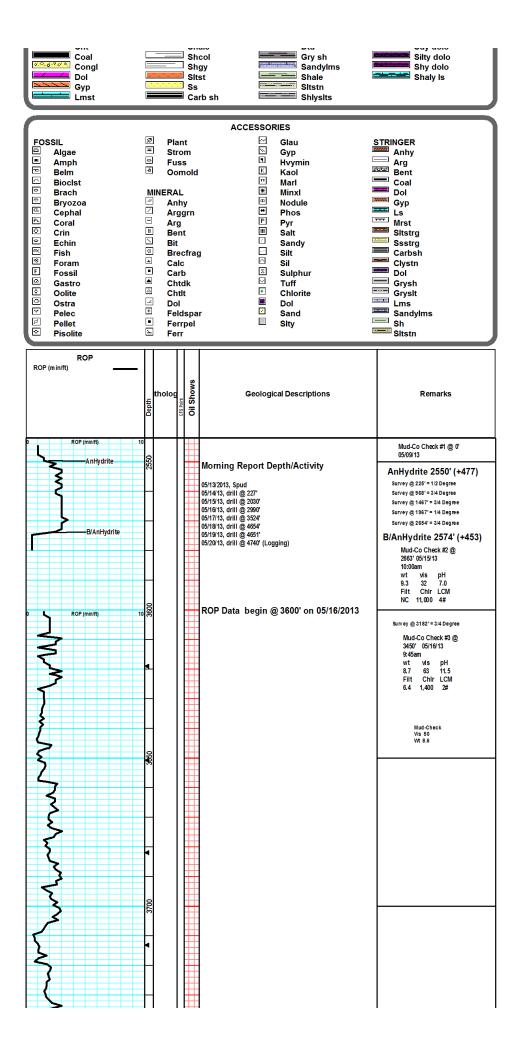
DSTs DST #1 "Johnson" 4585'-4626' 5/19/2013 30-45-60-90 1st Open = 1/2" Blw, bit to 6.5" (No BB) 2nd Open = No blow fow 7", bit to 8.5" (No BB) IFP=11-40# ISP=1018# FFP=43-86# FSP=1020# HYDP=2296-2299# 158' Total Fluid, 16' OCWM (6% Oil, 20% WTR), 16' SW&MO (98% Oil, 1% WTR), 126' SO&HMCW (1% Oil, 79% WTR)





ROCK TYPES Dol





2			
5	•		
	3750		
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3			
Ş		Drilling Samples began @ 3800' on	
2		05/16/2013	
}	8	LS: It tan/It gry, fn xin, v fw foss frags, mostly dense, sm brittle, fw sandy/gritty, tr-nvp, fw SH: gry, silty, easy-med crush, no cup odr, ns.	
ROP (min/ft)	10 88	LS: tan/it gry, fn xin, fw foss frags, sm dense, mostly britt sm chiky, tr-nvp, fw pcs pur chik, fw SH: gry, silty, no cup ns.	
ξ	ø	LS: tan/it gry, fn xin, fw foss frags, mostly brittle, sm dens chiky, tr-nvp, fw pcs pur chik, fw SH: gry, silty, no cup odr	
ζ	ø	LS: tan/it gry, fn xin, fw foss frags, fw dense, m ostly brittle chiky, tr-nvp, fw pcs pur chik fw SH: gry, silty, no cup odr,	
2		LS: tan/it gry, fn xin, sm foss crin/frags, fw dense, m o brittle, fw chiky, tr-? intfoss por in fw, fw pcs pur chik, no odr, ns.	cup
Deer Creek	3850	LS: tan/it gry, fn xin, fw foss frags, fw dense, sm brittle, sr chiky, travp, fw pospur chik, fw SH: drk gry/grn, silty, no odr, ns.	cup Deer Creek @ 3844 (-817)
5	Ø	LS: tan/lt gry, fn xin, fw foss frags, mostly brittle, fw dense chiky, tr-nvp, sm SH: gry/grn, silty, no cup odr, ns.	2, IW
3	•	LS: tan/gry, fn x/n, fw foss brach/frags, fw dense m ostly brittle, fw sandy/gritty, fr-nvp, sm SH: gry/grn, sitty, fw SIt brn, soft, gritty, fw muddy, no cup odr, ns.	Stn:
5	ø	LS: tan/gry, fn xin, v fw foss frags, sm brittle, fw dense, fw sandy/gritty, tr-nvp, fw pcs pur chik, sm SH: gry, silty, no odr, ns.	Sup Mud-Check
{	Ø	LS: gry/tan, fn xln, v fw foss frags, sm dense, sm brittle, fi flakey/m ealy, fw sandy/gritty, tr-nvp, fw pcs pur chlk, fw Si gry, sitty, no cup odr, ns.	V Vis 51
Larsh SH	•	LS: tan/it gry, fn xin, v fw foss frags, sm dense, sm brittle, sandy/gritty, tr-nvp, fw pcs pur chik, sm SH: gry, silty, no odr, ns.	
7	330	LS: tan/lt gry, fn xln, v fw foss frags, mostly brittle, fw den sm sandy/gritty, tr-nvp, fw pcs purchlk, no cup odr, ns.	se,
\	9	LS: tan/it gry, fn xin, sm brittle, fw dense, sm sandy/gritty, tr-nvp, fw SS: gry/brn, fn grn, brittle, fw arg, tr-nvp, fw SF gry, silty, no cup odr, ns.	l:
3	8	SH: gry/brn, silty, fw fissile, fw S S: gry/brn, fn grn, brittle arg, tr-? ppt-intgrn por, fw LS: tan/gry, sm mott, fn xin, sm dense, sm brittle, tr-nvp, no cup odr, ns.	
\leq		LS: It tan/It gry, fn xin, sm dense, sm brittle, fw sandy/grit tr-nvp, svri SH: gry/grn/brn, silty, fw gritty, no cup odr, ns	
{	50	LS: It tan/It gry, fn xin, mostly brittle, fw dense, fw sandy/ fw chiky, tr-nvp, fw SH: gry/grn, sitty, fw gritty, no cup odr	
	3950	LS: It tan/it gry, fn xin, sm dense, mostly brittle, fw chiky, tr-nvp, fw pcs pur chik, fw SH: gry/brn, silty, no cup odr, r	3956' (-929)
3		LS: It tan/It gry, fn xIn, fw foss frags, sm dense, m ostly bri fw chiky, travp, fw SS: gry, fn grn, brittle, tr-? intgrn por fw SH: gry/brn, silty, no cup odr, ns.	une, in fw, Mud-Check
2	Ø	LS: tan/lt gry, fn xin, fw foss frags, sm dense, mostly brittl tr-nvp, fw pcs pur chlk, fw SH: gry/brn, silty, no cup odr, r	
\leq		LS: tan/it gry, fn xin, sm foss brachifrags, sm v ool, mosti brittle, fw dense, sm pr-fr intfoss/intool por, fw Chert: wht/opaque, foss, sharp, no cup odr, ns.	
S ROP (min/ft)	■ Ø 10000	LS: tan/lt gry, fn xln, sm foss frags, sm dense, sm brittle f pcs w/ pr intfoss por, fw Chert: wht/gry, sharp, fw SH: gry silty, no cup odr, ns.	/brn,
Heebner SH		LS: tan/It gry, fn xin, sm foss brach/crin/frags, sm dense s brittle, fw chiky, t-nvp, fw Chert: tan/gry, sharp, fw SH: gry/brn, sity, no cup odr, ns.	Heebner @ 4010' (-983)
\sum		LS: It gry/tan, fn xin, mostly dense, sm brittle, sm chiky, tr fw pcs pur chik, sm SH: gry/blk, silty, sm carb, no cup od	r, ns. Mud-Co Check #4 @ 4039' 05/17/13 9:45am
<u> </u>		LS: gry/tan, fn xln, sm dense, sm brittle, fw sandy/gritty, tr-nvp, sm SH: gry/brn/grn, silty, fw waxy, no cup odr, ns.	wt vis pH 9.0 49 10.5 Filt Chlr LCM 6.4 1,500 1#
Toronto	Ø	LS: crm/lt tan, fn xln, m ostly dense, sm brittle, sm chlky, tr-nvp, fw pcs pur chlk, fw SH: gry/grm/brn, silty, fw waxy, cup odr, ns.	no Toronto @ 4034' (-1007)
3	0	LS: It tan/It gry, fn xin, fw forsorin/Trags, mostly brittle, sr dense, fw pcs w/ pr intxin por, fw pcs pur chlk, fw SH: grn/brn, silty, no cup odr, ns.	
Lansing		LS: tan/lt gry, fn xin, fw foss frags, profus ool, sm dense, mostly brittle, sm pr intool por in fw pcs, svrl pcs pur chli SH: grv/brn. siltv. no cup odr. ns.	_{k, sm} Lansing @ 4053' (-1026)

		0 01			
B Zone		6 5 0 0		LS: tan/gry, fn x/n, fw foss frags, profus ool, fw dense, mostly brittle, sm pr intool/intfoss por in sm, abund pur chlk, fw SH: gm/brn, siltv, no cup odr, ns.	
٤		¢ ¢		LS: tan/it gry, fn xin, fw ool, mostly dense, sm brittle, sm chiky, fw pcs w/ pr intxin por, svri pcs pur chik, fw SH:	
C Zone	•	•		gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, sm foss brach/crin/frags, mostly dense, sm brittle, fw chlky, tr-nvp, fw SH: gry/grn, silty, fw waxy, no cup	Mud-Check Vis 52
}		0		odr, ns. LS: tan/lt tan, fn xin, fw foss frags, sm dense, mostly brittle, fw chiky, sm 2nd rxin, tr-?intxin por in sm, fw pcs pur chik, no	VIS 52 Wt 8.9 CFS @ 4100'
D Zone	4100		9	cup odr,ns. LS:lttan/ltgry,fnxln,mostlydense,mostlybrittle,smchlky,	(30"/60")
3		C		tr-nvp, fw pcspur chlk, fw SH: gry/grn, silty, no cup odr, ns. LS: It tan/it gry, fn xin, sm dense, mostiy brittie, sm 2nd rxin,	
Š.	1	¢ Ø		fw chiky, tr-? intxin por in sm , fw pcs pur chik, fw SH: gry/grn, silty, no cup odr, ns. LS: It gry/it tan, fn xin, fw foss frags, fw ool, mostly dense,	
E Zone		* •		mostly brittle, tr-nvp, fw pcspur chlk, no cup odr, ns. LS: Ittan/Itgry, fn xin, sm fossbrach/frags, sm profusool,	
>		÷ Ø		mostly dense, mostly brittle, tr-nvp, fw pcs pur chlk, fw SH: gry/grn/brn, silty, no cup odr, ns. LS: tan/lt gry, fn xln, sm foss frags, sm dense, mostly brittle,	
F Zone			9	tr-nvp, sm SH: gry/grn/brn, silty, fw waxy, no cup odr, ns. LS: tan/lt tan, fn xln, m ostly brittle, fw dense, sm 2nd rxln, fw	CFS @ 4142' (30"/60")
Z	4150 -			pcsw/tr-?intxin por, mostly tight, smit brn? stns, nsfo, no cup odr, fw pcs SH: gry/brn, silty. LS: tan/lt tan, fn xln, sm dense, sm brittle, sm 2nd rxin, fw pcs	
G Zone				w/pr-? intxin por, fw pcspur chik, sm SH: gry/grn, silty, sm waxy, no cup odr, ns.	Mud-Check Vis 48 Wt 9.3
		0 0 0 0 0 0 0 0 0		LS: It tan/It gry, fn xin, sm profus ool, sm dense, mostly brittle, sm chiky, sm frintbol por in sm, fw pos pur chik, no cup odr, ns. S: crm/it tan fn xin fw force frame cm profus ool cm dence	
{	•			LS: crm/lt tan, fn xln, fw foss frags, sm profus ool, sm dense, mostly brittle, sm chiky, fw pcs w/ fr intool por, fw SH: gry/brn, silty, no cup odr, ns.	
<u>}</u>		9 Ø 0		LS: crm/lt tan, fn xln, fw foss crin/frags, sm dense, m ostly brittle, sm chlky, tr-nvp, fw pcs pur chlk, fw SH: gry/grn, silty, no cup odr, ns.	
Z		0 0		LS: gry/tan, fn xin, sm fossfuss/gast/frags, sm dense, sm brittle, fw chlky, tr-nvp, fw pcspurchlk, sm SH: gry/blk, silty, sm carb, no cup odr, ns.	
ROP (min/ft)	10 4500			LS: tan/gry, sm m ott, fn xin, mostly dense, fw brittle, fw chiky, tr-nvp, svri SH: gry/grn/brn, silty, fw carb, fw waxy, no cup odr,	Muncie Creek @ 4199' (-1172)
				ns. LS: gry/tan, fn xin, mostly dense, sm brittle, fw flakey/mealy, fw chiky, tr-nvp, fw pcs pur chik, fw Chert: wht, foss, sharp, no	4133 (-1172) Mud-Check
H Zone		~ ~		cup odr, ns. LS: gry/tan, fn xln, sm dense, sm brittle, fw flakey/mealy, fw pcs w/ scat pr vug por, mostly tight, fw pcs pur chlk, fw SH:	Wid-Creck Vis 55 Wit 9.1
}		4	9	gry/brn, silty, nocup odr, ns. LS: gry/tan, fn xln, mostly dense, sm brittle, fw chiky, fw flakey/mealy, tr-nvp, fw pcs pur chik, sm SH: gry/grn, silty, sm	CFS @ 4228' (30"/60")
- E	4			waxy, no cup odr, ns. LS: gry/lt tan, fn xin, mostly dense, sm brittle, fw chiky, tr-nvp, fw pcs pur chik, fw Chert: wht/opaque, sharp, fw SH: gry/grn,	
Ş	20			silty, fw waxy, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, sm brittle, fw chiky, fw pcs w/ drk min stns, no fluor/cut, tr-nvp, fw pcs pur chik, fw Chert	
I Zone	42	0 0 20	3	wht/opaque, sharp, no cup odr, ns. LS: It gry/It tan, fn-crs xIn, fw foss frags, fw ool, mostly dense,	CFS @ 4255' (30''/60'')
\searrow				sm 2nd rxin, fw chiky, tr-nvp, fw pcs pur chik, fw Chert gry/brn, sharp, no cup odr, ns. LS: tan/it gry, fn-crs xin, fw foss frags, m ostly dense, sm	
J Zone	•		9	brittle, svrl pcs w/ 2nd rxln, fw chlky, trnvp, fw pcs pur chlk, svrl SH: gry/grn/purp, silty, fw waxy, fw fissile, no cup odr, ns.	CFS @ 4275' (30"/60")
3				LS: It gry/crm, fn xln, mostly dense, sm hard, fw flakey/mealy, fw chiky, tr-nvp, fw pos pur chik, fw SH: gry/ grn, sitty, fw waxy, no cup odr, ns.	Mud-Check Vis 50 Vit 9.2
Stark SH		4		LS: It gry/it tan, fn xin, mostly dense, fw brittle, fw chiky, sm flakey/mealy, fw chiky, tr-nvp, fw pcs chik, fw SH: gry/grn, silty, fw waxy, no cup odr, ns.	Stark SH @ 4287' (-1260)
Swope	4 5 00			LS: tan/it gry, fn xin, m ostly dense, sm brittle, sm chiky, tr-nvp, fw pos pur chik, fw Chert: wht/gry, sharp, fw SH: gry/bik, si ity, fw carb, no cup odr, ns.	
2		ø ø	₀ ⋕	LS: It gry/It tan, fn xin, fw foss frags, mostly dense, mostly brittle, fw chiky, fw pcs w/ pr-? in xin por in sm, fw SH gry/bik, silty, w carb, no cup odr, ns.	CFS @ 4310'
Hushpuckney S	H	С		LS: gry/it tan, fn xin, v fw foss frags, mostly dense, sm brittle, fw w/ 2nd rxin, fw chiky, tr-nvp, fw Chert gry/smokey, sm SH: gry/grn/blk, silty, sm carb, no cup odr, ns.	(30"/60") Hushnucknev @
Hertha		С		LS: gry/tan, sm mott, fn xin, sm dense, sm brittle, sm chlky, tr-nvp, fw pcs pur chlk, fw SH: gry/brn/blk, silty, sm carb, no cup odr, ns.	Hushpuckney @ 4320' (-1293)
Base of KC	1	¢		LS: gry/tan, fn xln, fw foss frags, fw ool, mostly dense, sm brittle, tr-nvp, fw pcs w/ drk min stns, no cut, pos drk dead oil,	B/KC @ 4337' (-1310)
2		- ¢		no cup odr, ns. LS: gry/It tan, fn xin, sm dense, sm brittle, fw chiky, fw flakey/mealy, tr-nvp, fw pcs pur chik, fw SH: gry/brn, silvy, no	2/10 @ 4001 (-1010)
3	4350			cup odr,ns. LS: tan/ltgry,fnc:rsx/n,mostly dense,sm. brittle,fw.chlky, tr-nvp,fw. SH:gry/grn,silty,sm. waxy,no.cup.odr,ns.	Mud Co Charle #5 @
3		9		LS: tan/it tan, fn xin, mostly brittle, tr-nvp, sm SS: brn/gry, fn grn, silty, arg, brittle, tr-nvp, fw SitStn: gry/tan, soft, sm	Mud-CoCheck #5@ 4332'05/18/13 8:30am wt vis pH
$\left(\right)$		0 0		gnr, ang, or g, or new, ternop, no susting grynen, song sin muddy, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/lttan, fn x/n, mostly dense, sm chlky, fw flakey/mealy,	9.2 51 10.5 Filt Chir LCM 6.2 2,000 1#
Marmaton		00		tr-nvp, fw SltStn: brn, soft, gritty, sm muddy, fw SH: gry/grn/brn, silty, no cup odr, ns.	Marmaton @ 4380' (-1353)
				I S' anuitan fiu mott fn vin moeitu denee em hard tr.nun fiu	1

+ + X + + + + + +			cs. grytan, in moa, in an, mostly active, sin hard, artisp, in pcs w/ drk min stns, no fluor/cut, fw SH: gry/grn/brn, silty, fw	l
		 	waxy, no cup odr, ns. LS: tan/lt gry, fn xin, m ostly dense, fw hard, sm brittle, fw	
Lenapah			chiky, tr-n∨p, fw pospur chik, fw SH: gry/brn, sity, fw fissile, no cup odr, ns.	
ROP (min/ft)	10 4400		LS: gry/it tan, fn xin, mostly dense, fw hard, sm flakey/mealy, tr-nvp, svrl SH: gry/drk gry, silty, fw fissile, no cup odr, ns.	Mud-Check
\$			r-nyp, svri sn: gry/ark gry, siry, nv fissire, no cup oar, ns.	Vis 60 Wt 9.3
ξ			LS: It tan, fn-crs xin, sm dense, mostly brittle, fw chiky, tr-nvp, w SH: gry, sitty, soft, fw SitStn: gry, v soft, sm muddy, no cup	
< <	C		odr,ns. LS: tan/it gry,fnxin,sm dense,fw brittle,sm flakey/mealy,	
<u>د</u>	•		tr-nvp, svrl SH: gry/drk gry/blk, silty, fw fissile, fw carb, no cup odr, ns.	
2			LS: tan/It gry, fn xln, m ostly dense, fw hard, fw chlky, sm flakey/mealy, tr-nvp, sm SH: gry/drk gry, silty, sm soft, no cup	
Altamont		· 🖽 ۱	odr, ns.	
			LS: tan/It gry, fn xln, sm dense, fw brittle, sm chiky, tr-nvp, fw pcspur chik, svri SH: gry/grn/brn, silty, sm soft, sm v friable,	Pawnee @ 4448' (-1421)
Pawnee	4450		tr-nvp, no cup odr, ns. LS: tan/It tan, fn xIn, fw dense, mostly brittle, sm chlky, tr-nvp,	
2	•		fw pcspur chlk, fw SH:gry/grn,silty,fw fissile,nocupodr, ns.	DST#1 "Johnson" 4585'-4626' 5/19/2013 30-45-60-90
2			LS: gry/It tan, fn xIn, sm dense, mostly brittle, sm chlky, fw flakey/mealy, tr-nvp, fw SH: gry, silty, sm soft, no cup odr, ns.	1stOpen = 1/2" Blw,bit to 6.5" (No BB) 2nd Open = No blow fow 7",bit to
3				8.5" (NoBB) IFP=11-4.0# ISP=1018# FFP=43-86# FSP=1020#
3			SH: gry/grn/drk gry, silty, sm soft, fw LS: gry/tan, fn xin, sm dense, mostly brittle, sm chlky, fw flakey/mealy, tr-nvp, no cup odr, ns.	HYDP=2296-2299# 158'Total Fluid, 16' OC WM (6% Oil, 20% WTR), 16' SW&MO (98% Oil,
$\overline{}$			LS: tan/It tan, fn xln, fw foss frags, mostly dense, sm brittle,	20% WTR), 16° SW&MO (88% OII, 1% WTR), 126' SO&HMCW(1% OII, 79% WTR)
Up Ft Scott			mostly uniform, tr-nvp, abund Chert: wht/gry, sm foss, sharp, no cup odr, ns.	
	<u>⇔ø</u>	1	LS: tan/it gry, fn xin, sm dense, sm brittle, fw hard, fw flakey/mealy, tr-nvp, fw Chert: brn, sharp, fw SH: gry, silty, no	Mud-Check Vis 56
- {	4500		cup odr, ns. SH: blk/drk gry, silty, mostly carb, fw fissile, fw LS: gry/lt tan,	Wt 9.3
Little Osage SH			fn-crs xin, fw dense, mostly brittle, sm chiky, tr-nvp, no cup odr. ns.	Little Osage @
2			LS: gry/tan, fn-crs xIn, fw foss frags, mostly dense, sm brittle,	4507' (-1480)
Ft Scott	•	<u> </u>	fw flakey/mealy, fw chlky, tr-nvp, sm SH: gry/brn, silty, sm carb, no cup odr, ns.	
5	ø		LS: gry/lt tan, fn xln, v fw foss frags, sm dense, sm brittle, sm chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw Chert: brn,	
<u> </u>	0	+++	foss sharp, fw SH: gry/grn/brn, silty, no cup odr, ns. LS: It gry/crm, fn xln, v fw foss frags, mostly dense, mostly	
Excello SH			brittle, sm chlky, tr-nvp, fw pospur chlk, svri SH: blk/drk gry, silty, mosity carb, no cup odr, ns.	Excello @ 4533' (-1506)
2	Ø 4		LS: tan/lt gry, fn xin, fw foss frags, mostly dense, sm brittle, tr-nvp, fw pcs w/ drk min stns, no fluor/cut, fw Chert	
2	4530	1	tan/smokey, sharp, fw SH: gry/brn/grn, silty, fw waxy, no cup odr. ns.	
Vertig is	4 Ø		LS: tan/It gry, fn xin, fw foss frags, mostly dense, fw brittle, sm flakey/mealy, fw chiky, tr-nvp, fw Chert: gry/smokey, sharp, sm	
<u> </u>			w SH: drk gry/gry, silty, fw fissile, no cup odr, ns.	Mud-Co Check #6 @ 4626' 05/19/13
Cherokee SH			LS: tan/It gry, fn xln, fw foss frags, sm dense, mostly brittle, fw chiky, tr-nvp, fw Chert wht/opaque, sharp, fw SH gry/grn/blk,	8:15am wt vis pH
5	Ø.		silty, fw carb, no cup odr, ns. LS: tan/lt gry, fn xin, m ostly dense, fw hard, fw chlky/brittle, tr-nvp, fw Chert: gry/sm okey, sharp, svri SH: gry/brn/grn, silty,	9.4 54 10.5 Filt Chlr LCM
5			fw waxy, no cup odr, ns.	7.2 2,200 1#
Krebs		- <u>+ + +</u> +	LS: gry/tan, fn xln, mostly dense, fw hard, fw chlky/britty, tr-nvp, svrl SH: gry/grn/blk, silty, sm soft, sm carb, no cup odr, ns.	
\geq		ΗH	LS:lttan/ltgry,fnxln,mo stly dense,sm brittle,sm chlky,	Mud-Check Vis 53 Wt 9.2
DST #1			tr-nvp, svrl ŠH: gry/grn/blk, silty, tw waxy, sm soft, fw carb, no cup odr, ns.	
OP (min/ft)	4600	- ±±+ 1	LS: gry/tan, fn-crs xin, mostly dense, sm brittle, fw chiky, sm flakey/mealy, tr-nvp, sm SH: gry/brn, silty, fw fissile, no cup odr, ns.	
Johnson			LS: gry/tan, fn xin, mostly dense, fw chiky, fw hard, fw brittle, tr-? ppt itnxin por in fw pcs, 1-2 pcs w/ ight brn stns, wk-?	Johnson @ 4608' (-1581)
		∋ <mark>⊟</mark> 1	fluor, no cut, vss-nsfo, no cup odr, fw SH: gry/brn, silty.	CFS @ 4617' (30"/60")
F		· H+++I·	LS: tan/lt gry, fn xln, m ostly dense, sm brittle, sm chlky, tr-nvp, 1-2 pcs w/ drk min stns, no fluor/cut, pos drk dead oil, fw SH:	CFS @ 4626' (30"/60")
Atoka		°IIIII	gry/grn, silty, no cup odr, ns. LS: tan/gry, fn xln, mostly dense, sm chlky, sm brittle, tr-nvp, sm SH: gry/grn, silty, sm soft, fw waxy, tr-nvp, fw Chert:	Survey @ 4626' = 3/4 Degree
	8 8 8	· +++ ·	sm SH: gry/grn, sinty, sm sort, rw waxy, tr-nvp, rw Cnert: wht/opaque, sharp, fw SS: crm/lt tan, v fn grn, arg, tr-nvp, no cup odr. ns.	Mud-Check Vis 60
America Morrow		Ħ	LS: tan/gry, fn xin, mostly dense, fw hard, fw chiky, sm flakey/mealy, tr-nvp, svri SH: gry/brn/grn/olive, silty, fw	™ ^{9.3} Morrow @ 4641' (-1614)
2			weathered, fw SltStn: gry/brn/purp, soft, sm muddy, fw SS: crm/lt tan, fn xln, sm arg, tr-nvp, no cup odr, ns.	
3	465		LS: tan/grn, fn xln, sm sandy/gritty, sm brittle, sm weathered,	
Mississippi		±±+1	fw chiky, tr-nvp, sm SH: gry/blu/grn, silty, sm weathered, fw fissile, no cup odr, ns.	
=_		_ +++ 1	LS: crm/tan, fn xln, sm sandy/gritty, sm chlky, fw brittle, tr-nvp, fw SH: gry/grn/olive, silty, sm weathered, fw SS: tan/grn, arg, sm weather tr-nvp, no gun odr, ns	Mississippi @ 4658' (-1631)
2		+++	sm weather, tr-nvp, no cup odr,ns. LS:lttan/itgry,fn xin,mostly dense,sm chiky,sm	
3			sandy/gritty, fw brittle, tr-nvp, sm SH: gry/grn/olive, silty, sm weathered, sm soft, no cup odr, ns.	Mud-Check Vis 57
2			LS: tan/lt gry, fn xin, m ostly dense, sm sandy/gritty, fw chiky, fw brittle, tr-nvp, fw SH: gry/grn, silty, no cup odr, ns.	Wt 9.3
3				
<			LS: It tan/It gry, fn xin, sm dense, sm sandy/gritty, fw chlky, sm brittle, tr-nvp, fw SH: gry/brn, silty, fw fissile, no cup odr, ns.	
	4170	Ħ	LS: tan/It tan, fn xln, sm sandy/gritty, sm chlky, fw brittle,	
			tr-nvp, svrl SH: gry/brn, silty, fw weathered, fw Sitstn: soft, sm	

N~~~		gritty, no cup odr, ns. LS: tan/lt tan, fn xin, sm sandy/gritty, fw chiky, mostly brittle, tr-nvp, sm SH: gry/grn/brn, silty, sm soft fw Sit Stn: soft gritty, fw muddy like, no cup odr, ns. LS: tan/lt tan, fn xin, sm sandy/gritty, sm brittle, fw chiky, fw flakey/mealy, tr-nvp, fw SH: gry/grn, silty, no cup odr, ns. LS: tan/lt tan, fn xin, sm sandy/gritty, fw dense, sm brittle, fw pcs w/ pr-? inbún por, fw SH gry, silty, fw fissile, no cup odr, ns.	Mud-CoCheck#7@ 4750'05/20/13 8:00am wt vfs pH 9.5 57 10.0 Filt Chir LCM 8.0 3,000 1#
3	00	tan/It gry, fn xin, v fw foss frags, sm dense, sm sandy/gritty, fw chiky, tr-nvp, fw pcs pur chik no cup odr, ns.	CSF @ 4750' (30''/60'')
RTD 4750', -1723 LTD 4751', -1724			Survey @ 4750' = 3/4 Degree