Confidentiality Requested: Yes No

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

1147258

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 Dorth / 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 #:
	Field Name:
	Producing Formation:
	Elevation: Ground: Kelly Bushing:
	Total Vertical Depth: Plug Back Total Depth:
CM (Cool Red Mathano)	Amount of Surface Pipe Set and Cemented at: Feet
$\square$ Cathodic $\square$ Other (Core Expl. etc.):	Multiple Stage Cementing Collar Used? Yes No
If Workover/Be-entry: Old Well Info as follows:	If yes, show depth set:
Operator:	If Alternate II completion, cement circulated from:
Well Name:	feet depth to: w/ sx cmt
Original Comp. Date: Original Total Depth:	
	Duilling Fluid Management Disp
Plug Back       Conv. to GSW       Conv. to Producer	(Data must be collected from the Reserve Pit)
Commingled Permit #:	Chloride content: ppm Fluid volume: bbls
Commingled Permit #	Dewatering method used:
SWD Permit #:	Location of fluid disposal if hauled offeite:
ENHB     Permit #:	
GSW Permit #:	Operator Name:
	Lease Name: License #:
Spud Date or Date Reached TD Completion Date or	Quarter Sec TwpS. 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 Two	1147258	
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).

Drill Stem Tests Taken (Attach Additional Sh	eets)	Yes No		og Formatio	on (Top), Depth a	nd Datum	Sample
Samples Sent to Geolog	gical Survey	Yes No	Nam	e		Тор	Datum
Cores Taken Electric Log Run		☐ Yes ☐ No ☐ Yes ☐ No					
List All E. Logs Run:							
		CASING Report all strings set-c	RECORD Ne	w Used ermediate, product	ion, etc.		
Purpose of String	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	EEZE RECORD			
Purpose:	Depth Ton Bottom	Type of Cement	# Sacks Used		Type and F	Percent Additives	

Purpose:	Depth Top Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
Protect Casing				
Plug Off Zone				

Did you perform a hydraulic fracturing treatment on this well?	Yes
Does the volume of the total base fluid of the hydraulic fracturing treatment exceed 350,000 gallons?	Yes
Was the hydraulic fracturing treatment information submitted to the chemical disclosure registry?	Yes

Yes	No
Yes	No
Yes	No

(If No, skip questions 2 and 3) (If No, skip question 3)

(If No, fill out Page Three of the ACO-1)

Shots Per Foot	PERFORATION RECORD - Bridge Plugs Set/Type Specify Footage of Each Interval Perforated			А	cid, Fracture, Shot, C (Amount and Kind	ement Squeeze Record d of Material Used)	Depth			
TUBING RECORD:	Siz	ze:	Set At:		Packer	r At:	Liner Ru	in: Yes	No	
Date of First, Resumed	Product	ion, SWD or ENHF	<b>}</b> .	Producing N	/lethod:	ping	Gas Lift	Other (Explain)		
Estimated Production Per 24 Hours		Oil Bb	S.	Gas	Mcf	Wat	er	Bbls.	Gas-Oil Ratio	Gravity
DISPOSITIO	ON OF G	GAS:			METHOD	OF COMPLE	TION:		PRODUCTION IN	TERVAL:
Vented Sold	ed Sold Used on Lease Open Hole Perf. Dually Comp. Commingled			Commingled						
(If vented, Sul	bmit ACC	D-18.)		Other (Specify,	)	(Submit )	400-5)	(Submit ACO-4)		

Form	ACO1 - Well Completion
Operator	Grand Mesa Operating Company
Well Name	JANOVA 2-27
Doc ID	1147258

All Electric Logs Run

CPDCN Micro Log
AI Shallow Focused Elect Log
Micro Log
Cement bond log

Form	ACO1 - Well Completion
Operator	Grand Mesa Operating Company
Well Name	JANOVA 2-27
Doc ID	1147258

Tops

Name	Тор	Datum
Stone Corral	2533	+491
Bs/Stone Corral	2555	+469
Heebner	3994	-970
Lansing	4033	-1009
Muncie Creek	4184	-1160
Stark	4268	-1244
Marmaton	4362	-1338
Excello	4510	-1486
Mississippian	4628	-1604
LTD	4710	

# John Goldsmith Wellsite Service

Cell and Home Phone: 316-640-0236

427 Roosevelt St. Cheney, KS 67025

Scale 1:240 (5"=100') Imperial Measured Depth Log

Spud Date: 5/22/2013 Surface Coordinates: Lat: 38.9825422

Coordinates: Ground Elevation (ft): 3015' Logged Interval (ft): 3600' Type of Drilling Fluid: Chemical

Well Name: #2-27 Janova Location: 2420' FNL, 753' FEL, Section 27-12S-32W, SE SW SE NE License Number: API: 15-109-21183 **Region: Logan County** Drilling Completed: 5/31/2013 Long: -100.8532268 Bottom Hole Vertical hole K.B. Elevation (ft): 3024' Total Depth (ft): 4715 To: RTD

Formation: Mississippian at RTD

Printed by WellSight Log Viewer from WellSight Systems 1-800-447-1534 www.WellSight.com

# **OPERATOR**

Company:Grand Mesa Operating CompanyAddress:1700 N. Waterfront Parkway Bldg. 600 Wichita, KS 67206-5514

# GEOLOGIST

Name: John Goldsmith Company: John Goldsmith Wellsite Service Address: 427 Roosevelt St. Cheney, KS 67025 (316) 640-0236

COMMENTS Contractor: Duke Drilling #4 **Pusher: Rich Wheeler** Surface Casing: 8 5/8" set at 216' w/165sx Production Casing: 5 1/2" set at 4710',

Mud by: MudCo DST's by: Diamond Testing Logs by: Weatherford Wireline (DIL, CN-CD, ML)

RTD=4715'

LTD=4710'

FORMATION TOPS	SAMPLE TOPS	LOG TOPS
FORMATION	Depth Datum	Depth Datum
Stone Corral B/Stone Corral Heebner Shale Lansing Muncie Creek Shale Stark Shale Hushpuckney Shale Marmaton Upper Fort Scott Little Osage Shale Excello Shale Johnson Zone Morrow Mississippian RTD	2533'       +491         2555'       +469         3994'       -970         4033'       -1009         4184'       -1160         4268'       -1244         4302'       -1278         4362'       -1338         4465'       -1441         4487'       -1463         4512'       -1488         4588'       -1564         4614'       -1590         4643'       -1619         4715'       -1691	2533'+4912555'+4693994'-9704033'-10094184'-11604268'-12444302'-12784362'-13384465'-14414486'-14624510'-14864586'-15624608'-15844628'-1604
LTD		4710' -1686



<ul> <li>Brach</li> <li>Bryozoa</li> <li>Cephal</li> <li>Coral</li> <li>Crin</li> <li>Echin</li> <li>Fish</li> <li>Foram</li> <li>Fossil</li> <li>Gastro</li> <li>Oolite</li> </ul>		INERA Ani Arg Bei Bit Cai Cai Chi	AL hy ggrn J nt cfra cfra tdk tdk tlt	g Salt Salt Salt Salt Salt Salt Sulphur Sulphur Chlorite	Dol Gyp Ls Mrst Sltstrg Ssstrg Carbsh Clystn Dol Grysh Grysh
<ul> <li>Ostra</li> <li>▼ Pelec</li> <li>Ø Pellet</li> <li>◆ Pisolite</li> </ul>	+ ∙	Dol Fel Fer Fer	l dspa rpel r	ar	Lms Sandylms Sh Sltstn
Curve Track 1 ROP (min/ft)	Depth	itholog	Oil Shows	Geological Descriptions	Remarks
0 ROP (min/ft) 1(	3600			ROP Data begins @ 3600' on 5/25/2013 Morning Report Depth/Activity	Mud-Co Check 5/22/13 0' Survey @ 216' = 3/4 Degree Survey @ 1005' = 1/2 Degree Survey @ 1502' = 0 Degrees Survey @ 2031' = 3/4 Degree
	50			05/23/13, drlg @ 428' 05/24/13, drlg @ 2237' 05/25/13, drlg @ 3294' 05/26/13, drlg @ 3832' 05/27/13, drlg @ 4143' (DST #1) 05/28/13, drlg @ 4290' 05/29/13, drlg @ 4602' (DST #2) 05/30/13, drlg @ 4680' 05/31/13, drlg @ 4715' (TD/Logging)	Mud-Co Check 5/24/13 2406' Wt Vis pH 8.9 31 7.0 Flt Chl LCM n/c 7,700 2# Survey@2624' = 3/4 Degree
<u>S</u>	36!				Survey @ 3120' = 3/4 Degree
					Mud-Co Check 5/25/13 3329' Wt Vis pH 9.1 30 7.0 Fit Chi LCM n/c 10,000 2#
	3700				
	3750				Drilling Time was not recorded.
		33		Sample Desc. begin @ 3800' on 5/26/2013 LS-crm, med xIn, grainy, foss, mealy, chalky, fr int xIn por, no	
	800	61 		cup odr, ns. LS-as above, influx of dolo LS-crm-It tan, fn xln, dense, hard, nvp, no cup odr, ns. LS-crm, med-crs xln, foss-various, mealy, chalky, pr int xln por,	
	3			NO change, foss-crin, sm SH-brn, red, silty.	
Deer Creek				LS-mostly crm, crs xln, as above, sm LS-med gry, crs xln, foss-fus/crin, sm chert filled int foss por, hard, brittle, nvp, no cup odr, ns.	
$\sum_{n=1}^{\infty}$		Ø		fr int part por, no cup odr, ns.	
	1 3850	Ø		LS-crm, crs xln, mealy, foss-various, grainy, chalky, sm int part por, no cup odr, ns.	
Larsh SH		C O O		LS-as above, no change. LS-crm, crs xln, mealy, foss-crin/fus, chalky, sm CHERT, sm	arsh @ 3876' (-852)
$\left\{ \right\}$				SH-blk, carb, no cup odr, ns. SS-dirty gry/lt grn, fn grn, qtz, arg, well srtd, sub round, calc, well cem, no cup odr, ns.	
	3900			SS-much as above, influx of SS-brick red, qtz, well srtd, sub round, semi friable, no cup odr, ns.	Mud-Co Check

			E	DOLO-It tan/crm, fn xln, uniform, dense, nvp, ns, LS-wht/crm,	9.1 46 10.5 Fit Chi LCM
		- Ø		fn-med xIn, chalky, flakey/mealy in part, foss- various, sm int xIn/part por, no cup odr, ns. LS-It tan, crs xIn, mealy, foss, chalky, nyp, sm DOLO as above.	6.4 1,800 1#
Oread		C		no cup odr, ns. LS- as above, SH-med-drk gry, silty, striated, no cup odr, ns.	
Z				LS-It tan, fn xln, uniform, hard, brittle, nvp, ns, sm LS-It tan,	
	3950	۵ ۳		mealy as above, no cup odr, ns.	
2	4	o C ≏		CHERT-gry, transl, foss-fus, abund chalk, sm int foss por, no cup odr, ns.	
$\leq$		Ø 		LS-mostly as above, sm gry, crs xIn, foss, no cup odr, ns.	
2		c Ø		LS-crm/tan, crs xIn, foss, fr int part por, no cup odr, ns.	
3	4	ø		LS-as above grading to more gry w/decr foss, decr por, no cup odr, ns.	
Heebner SH				SH-blk, carb, flood in 4010 smpl. soft to brittle, sm fiss.	Heebner @ 3994' (-970)
0 (min/ft)	10				
Z				SLTSTN, It gry/grn, gritty/sandy/shaley, sm pyrite, no cup odr, ns.	
-Toronto	4			SH-brick brn/red, silty, cup water is muddy brn/red. LS-crm, micro/fn xln, ool/foss-bryz/various, scat fr int foss por,	
Lansing				abund pure white chalk, no cup odr, ns.	Lansing @ 4036' (-1009)
$\mathbf{x}$		¢		LS-crm, micro xln, densely packed ool/foss, int ool por filled	
2	40 <b>€</b> 0	\$ \$		with calcite, abund pure chalk, no cup odr, ns.	
$\sum$		Ø ¢		LS-as above, decr ool, abund chalk, fr-gd in part por, no cup odr, ns.	DST #1 "E/F Zone" 4106-4143' 5/27/2013 30-45-45-60
		Ø ¢		odr, ns.	1st Open = 1/4" Blw, bit to 1.25" (No BB) 2nd Open = VWSB bit to 1/4" (No BB)
C Zone				SH-red/brn/gry, silty. 30min LS-crm/gry, fn-sm crs xln, mostly mealy, foss, ool, w/fr	FFP=13-21# FSP=1231# FFP=13-21# FSP=1241# HYDP=1954-1954# 30' Mud
		Ŷ	9	Int part por, ns, sm LS-gry, in Xin, less ioss, dense w/nvp, no cup odr, ns. 60min - no change.	CFS @ 4088'
				LS-crm, crs xin, v chaiky, pr int xin por, no cup oar, ns. LS-crm, crs xin, mealy, grainy, v chalky, fr-gd int xin por, SH-med-drk grv. siltv. no cup odr. ns.	(30"/60")
	410(	C ⊗		LS-as above, v foss-fus/bryz, fr int foss/vug por, no cup odr,	
E Zone	4	÷ 		ns. 30MIN, LS-crm, med-crs xln, foss as above, v chalky, 5-7 pcs	
DST #1			Э	por on break, fnt diesel odr to cup, probably diesel fuel! 20% sat brn stn in drys. 60MIN - as above, incr show to fr sho drk fo in many pcs per trav. will not readily break out of part po	CFS @ 4020' (30''/60'')
F Zone				fluor?.	Survey @ 4143' = 3/4 Degree
<b>Υ</b>		ø	, ,	LS-much as above, wht/crm, crs xln, sm fr vug/pp por, ssfo in all por, diff to break out of por, no cup odr, no fluor.	CFS @ 4143'
G Zone	1150	0	1	LS-crm, fn xln, mostly uniform, sm foss, dense, nvp, no cup odr, ns.	(30°760°°)
$\mathbf{Z}$		c t		LS-It tan, crm, med xln, mostly uniform, sm flakey/mealy foss, v chalky, easy crush, 3 pcs per tray w/blk tarry stain, does not break out of port no sup odd as	Mud-Co Check 5/27/13 4143' Wt Vis pH
		C		LS-It tan/crm, mostly vfn xln, uniform, dense, nvp, no cup odr, ns.	9.2 61 11.0 Flt Chl LCM 6.4 2,800 1#
	•	à		no change	,
Muncie Creel	*	ಳ 98 ⇔		SH-blk, carb, soft to brittle, not fissile, LS-as above, influx of	Muncie Creek @ 4184' (-1160)
				LS-tan, micro-fn xln, mostly uniform, rare foss, dense, brittle,	טטוו־) דטוד)
0 H Zone	1000			LS-crm, vfn xln, mostly uniform, dense, brittle, rare foss, nvp, no cup odr. ns.	
				CIRC 30min, LS-as above, 1 pc w/pr int xln por, vss thick tarry/flakey oil, no cup odr, no fluor.	CFS @ 4216'
			Э	LS-It tan/crm, fn xln, mostly uniform, sm foss, chalky, nvp, no cup odr, ns.	(30''/60'')
Z Zone			F	SH-It gry/grn, silty, mica, soft to brittle.	
	4	*		CIRC30min, LS-It tan, fn xln, uniform to foss-brach, v chalky, sm CHERT, nvp, no cup odr, ns.	
3	0		9	SH-brick red, soft, cup water dirty red.	CFS (@ 4242' (30''/60'')
	425	F		LS-It gry, micro-fn xIn, dense, brittle, mostly uniform, sm foss, sltly chalky, one pc per tray w/pr int xIn por, yss blk fo trapped	
	4	С		in chalky matrix, no cup odr. 30Min smpl as above, increase in pure white chalk.	Start @ 1969' ( 1944)
Stark SH		ø		SH-blk, carb.	Stark @ 4268 (-1244)
Swope		\$ \$		LS-gry, med xin, iossidor, charky, med gry ooids in wht LS matrix, nvp, no cup odr, ns.	Mud-Co Check 5/28/13 4297' CFS @ 4286' Wt Vis pH
			⊙ 	LS-crm, micro xln, mostly dense, chalky, sm CHERT-gry,	(30"/60") 9.3 55 9.5 Fit Chi LCM 9.6 3,000 1#
Hushpuckney SH	4300			transl, no cup odr, ns.	
		ø		SH-bik, carb. LS-lt brn, fn-med xin, mottled, sm foss, hard, brittle, dense,	4302' (-1278)
Hertha		ø		nvp, no cup our, ns. LS-tan/gry, micro xln, foss, hard, brittle, nvp, no cup odr, ns.	
		Ø¢		LS-gry-It tan, fn xIn, grainy, foss, ool in part, chalky, nvp, no cup odr, ns, SH-med gry, sm dark, mostly uniform. some siltv.	
	-1	¢.		, ,	
Base of KC	4			LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns.	B/KC @ 4331' (-1307)
Base of KC				LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns.	B/KC @ 4331' (-1307)
Base of KC	4350			LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns.	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on
Base of KC Marmaton	<ul> <li>▲ 4350</li> <li>▲</li> </ul>			LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: gry/It tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/brn, silty, no	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in.
Base of KC Marmaton	₹ 4350			LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: gry/It tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, fw pcs w/ pr vug por, fw SH: brn/grv, siltv. no	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338)
Base of KC Marmaton	▲ 4350			LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: gry/It tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, fw pcs w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, fw pcs w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns.	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338)
Base of KC Marmaton	▲     4350			LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: gry/It tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, fw pcs w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, sm sandy/gritty, tr-nvp, sm SH: gry/brn, silty, no cup odr, ns.	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338)
D Base of KC Marmaton Marmaton	1     1     1     1       4400     ▲     4350     1     ▲			LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: gry/It tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, fw pcs w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, sm sandy/gritty, tr-nvp, sm SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, svrl SH: gry/brn, silty, sm gritty/sandy like, no cup odr, ns. LS: tan/It gry, fn xln, mostly dense, fw brittle. sm chlkv. fw	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338)
D ROP (min/ft)	B     4400     ▲     4350     ■			LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: gry/It tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, fw pcs w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, sm sandy/gritty, tr-nvp, sm SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, svrl SH: gry/brn, silty, sm gritty/sandy like, no cup odr, ns. LS: tan/It gry, fn xln, mostly dense, fw brittle, sm chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, sm SH: gry, silty, med crush, no cup odr, ns.	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338)
Base of KC Marmaton ROP (min/ft)				LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: gry/It tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, fw pcs w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, sm sandy/gritty, tr-nvp, sm SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, sm sandy/gritty, tr-nvp, sm SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, svrI SH: gry/brn, silty, sm gritty/sandy like, no cup odr, ns. LS: tan/It gry, fn xln, mostly dense, fw brittle, sm chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, sm SH: gry, silty, med crush, no cup odr, ns. LS: It gry/tan, fn xln, mostly dense, sm chlky, fw brittle, tr-nvp, sm SH: gry/grn, silty, med crush, no cup odr, ns. LS: gry/It tan, fn xln, sm dense, sm brittle, fw chlky fw	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389)
Base of KC Marmaton ROP (min/ft) Altamont	■     □       0     0			LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: gry/lt tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, fw pcs w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, sm sandy/gritty, tr-nvp, sm SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, svrl SH: gry/brn, silty, sm gritty/sandy like, no cup odr, ns. LS: tan/lt gry, fn xln, mostly dense, fw brittle, sm chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, sm SH: gry, silty, med crush, no cup odr, ns. LS: t gry/tan, fn xln, mostly dense, fw brittle, sm chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, sm SH: gry, silty, med crush, no cup odr, ns. LS: t gry/tan, fn xln, mostly dense, sm chlky, fw brittle, tr-nvp, sm SH: gry/grn, silty, med crush, no cup odr, ns. LS: gry/lt tan, fn xln, sm dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs w/ drk min stns, no fluor/cut, sm SH: gry/grn/blu, silty, fw waxy, no cup odr, ns.	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389)
Pawnee				LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: gry/It tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, fw pcs w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, sm sandy/gritty, tr-nvp, sm SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, svrl SH: gry/brn, silty, sm gritty/sandy like, no cup odr, ns. LS: tan/It gry, fn xln, mostly dense, fw brittle, sm chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, sm SH: gry, silty, med crush, no cup odr, ns. LS: It gry/tan, fn xln, mostly dense, sm chlky, fw brittle, tr-nvp, sm SH: gry/grn, silty, med crush, no cup odr, ns. LS: gry/It tan, fn xln, sm dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs w/ drk min stns, no fluor/cut, sm SH: gry/grn/blu, silty, fw waxy, no cup odr, ns. LS: It tan/It gry, fw mott, fn xln, sm dense, sm brittle, fw sandy/gritty, fw chlky, tr-nvp, fw SH: gry/brn, silty, no cup odr, ns.	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406)
Base of KC Marmaton ROP (min/ft) Altamont				LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: gry/It tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, fw pcs w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, fw pcs w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, sm sandy/gritty, tr-nvp, sm SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, svrl SH: gry/brn, silty, sm gritty/sandy like, no cup odr, ns. LS: tan/It gry, fn xln, mostly dense, fw brittle, sm chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, sm SH: gry, silty, med crush, no cup odr, ns. LS: It gry/tan, fn xln, mostly dense, sm chlky, fw brittle, tr-nvp, sm SH: gry/grn, silty, med crush, no cup odr, ns. LS: gry/It tan, fn xln, sm dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs w/ drk min stns, no fluor/cut, sm SH: gry/grn/blu, silty, fw waxy, no cup odr, ns. LS: It tan/It gry, fw mott, fn xln, sm dense, sm brittle, fw sandy/gritty, fw chlky, tr-nvp, fw SH: gry/brn, silty, no cup odr, ns. LS: tan/It tan, fn xln, mostly dense, sm brittle, fw sandy/gritty, fw chlky, tr-nvp, fw SH: gry/brn, silty, no cup odr, ns.	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406)
Pawnee	4 <b>4</b> 50 <b>→</b> 4400 <b>→</b> 4350 <b>→</b> 4350			LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: gry/It tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: brn/gry, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, fw pcs w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, sm sandy/gritty, tr-nvp, sm SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, svrl SH: gry/brn, silty, sm gritty/sandy like, no cup odr, ns. LS: tan/It gry, fn xln, mostly dense, fw brittle, sm chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, sm SH: gry, silty, med crush, no cup odr, ns. LS: It gry/tan, fn xln, mostly dense, sm chlky, fw flakey/mealy, tr-nvp, fw pcs w/ chk min stns, no fluor/cut, sm SH: gry/grn, silty, med crush, no cup odr, ns. LS: gry/It tan, fn xln, sm dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs w/ drk min stns, no fluor/cut, sm SH: gry/grn/blu, silty, fw waxy, no cup odr, ns. LS: It tan/It gry, fw mott, fn xln, sm dense, sm brittle, fw sandy/gritty, fw chlky, tr-nvp, fw SH: gry/brn, silty, no cup odr, ns. LS: tan/It tan, fn xln, mostly dense, sm brittle, fw sandy/gritty, fw chlky, tr-nvp, fw SH: gry/brn, silty, no cup odr, ns. LS: tan/It tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry, silty, no cup odr, ns. LS: tan/gry, fn xln, mostly dense, sm brittle, fw chlky, tr-nvp, svrl SH: gry/drk gry, silty, med crush, no cup odr, ns.	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406)
Pawnee Pawnee				LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: gry/lt tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, fw pcs w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, sm sandy/gritty, tr-nvp, sm SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, svrl SH: gry/brn, silty, sm gritty/sandy like, no cup odr, ns. LS: tan/lt gry, fn xln, mostly dense, fw brittle, sm chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, sm SH: gry, silty, med crush, no cup odr, ns. LS: lt gry/tan, fn xln, mostly dense, sm chlky, fw brittle, tr-nvp, sm SH: gry/grn, silty, med crush, no cup odr, ns. LS: gry/tan, fn xln, sm dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs w/ drk min stns, no fluor/cut, sm SH: gry/grn, silty, fw waxy, no cup odr, ns. LS: lt tan/lt tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs w/ drk min stns, no fluor/cut, sm SH: gry/grn/blu, silty, fw waxy, no cup odr, ns. LS: lt tan/lt tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry, silty, no cup odr, ns. LS: tan/lt tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry, silty, no cup odr, ns. LS: tan/lt tan, fn xln, mostly dense, sm brittle, fw chlky, tr-nvp, svrl SH: gry/drk gry, silty, med crush, no cup odr, ns. LS: tan/lt tan, fn xln, mostly dense, sm brittle, fw chlky, tr-nvp, svrl SH: gry/drk gry, silty, med crush, no cup odr, ns.	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406) Upper Ft. Scott @ 4465' (-1441)
Base of KC Marmaton				LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: gry/It tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, fw pcs w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, sm sandy/gritty, tr-nvp, sm SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, swrl SH: gry/brn, silty, sm gritty/sandy like, no cup odr, ns. LS: tan/It gry, fn xln, mostly dense, fw brittle, sm chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, sm SH: gry, silty, med crush, no cup odr, ns. LS: it gry/tan, fn xln, mostly dense, sm chlky, fw brittle, tr-nvp, sm SH: gry/grn, silty, med crush, no cup odr, ns. LS: it gry/tan, fn xln, sm dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs w/ drk min stns, no fluor/cut, sm SH: gry/grn/blu, silty, fw waxy, no cup odr, ns. LS: It tan/It gry, fw mott, fn xln, sm dense, sm brittle, fw sandy/gritty, fw chlky, tr-nvp, fw SH: gry/brn, silty, no cup odr, ns. LS: tan/It tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry, silty, no cup odr, ns. LS: tan/It tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry, silty, no cup odr, ns. LS: tan/It tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry, silty, no cup odr, ns. LS: tan/It tan, fn xln, mostly dense, sm brittle, fw chlky, tr-nvp, svrl SH: gry/drk gry, silty, med crush, no cup odr, ns. LS: tan/It tan, fn xln, mostly dense, sm brittle, fw chlky, tr-nvp, svrl SH: gry/drk gry, silty, med crush, no cup odr, ns. LS: tan/It tan, fn xln, mostly dense, sm brit	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406) Upper Ft. Scott @ 4465' (-1441)
Base of KC Marmaton				LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: gry/It an, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, fw pcs w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, sm sandy/gritty, tr-nvp, sm SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, swrl SH: gry/brn, silty, sm gritty/sandy like, no cup odr, ns. LS: tan/It gry, fn xln, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, fw pcs pur chlk, sm SH: gry, silty, med crush, no cup odr, ns. LS: It gry/tan, fn xln, mostly dense, fw brittle, sm chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, sm SH: gry, silty, med crush, no cup odr, ns. LS: It gry/tan, fn xln, mostly dense, sm chlky, fw brittle, tr-nvp, sm SH: gry/grn, silty, med crush, no cup odr, ns. LS: gry/It tan, fn xln, sm dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs w/ drk min stns, no fluor/cut, sm SH: gry/grn/blu, silty, fw waxy, no cup odr, ns. LS: it an/It gry, fw mott, fn xln, sm dense, sm brittle, fw sandy/gritty, fw chlky, tr-nvp, fw SH: gry/brn, silty, no cup odr, ns. LS: tan/It tan, fn xln, mostly dense, sm brittle, sm chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry, silty, no cup odr, ns. LS: tan/It tan, fn xln, mostly dense, sm brittle, fw chlky, tr-nvp, svrl SH: gry/drk gry, silty, med crush, no cup odr, ns. LS: tan/It tan, fn xln, mostly dense, sm hard, fw flakey/mealy, tr-nvp, abund Chert: wht/opaque, sharp, fw SH: gry/drk gry, silty, no cup odr, ns. LS: tan/It tan, fn xln, mostly dense, sm hard, sm flakey/mealy, tr-nvp, svrl Chert: wht/opaque, sharp, fw SH: gry/drk gry, sm fissile, no cup odr, ns.	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406) Upper Ft. Scott @ 4465' (-1441)
Base of KC Marmaton				LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: gry/Itan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pos pur chlk, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, fw pos w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, sm sandy/gritty, tr-nvp, sm SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, sm sandy/gritty, tr-nvp, sm SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, svrl SH: gry/brn, silty, sm gritty/sandy like, no cup odr, ns. LS: tan/It gry, fn xln, mostly dense, fw brittle, sm chlky, fw flakey/mealy, tr-nvp, fw pos pur chlk, sm SH: gry, silty, med crush, no cup odr, ns. LS: It gry/tan, fn xln, mostly dense, sm chlky, fw brittle, tr-nvp, sm SH: gry/grn, silty, med crush, no cup odr, ns. LS: gry/It tan, fn xln, sm dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pos w/ drk min stns, no fluor/cut, sm SH: gry/grn/blu, silty, fw waxy, no cup odr, ns. LS: tan/It gry, fw mott, fn xln, sm dense, sm brittle, fw sandy/gritty, fw chlky, tr-nvp, fw SH: gry/brn, silty, no cup odr, ns. LS: tan/It tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pos pur chlk, fw SH: gry, silty, no cup odr, ns. LS: tan/It tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pos pur chlk, fw SH: gry, silty, no cup odr, ns. LS: tan/It tan, fn xln, mostly dense, sm hard, fw flakey/mealy, tr-nvp, swI GH: gry/drk gry, silty, med crush, no cup odr, ns. LS: tan/It tan, fn xln, mostly dense, sm hard, sm flakey/mealy, tr-nvp, sund Chert: wht/opaque, sharp, fw SH: gry/drk gry, silty, no cup odr, ns. LS: tan/gry, fn xln, mostly dense, fw bri	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406) Upper Ft. Scott @ 4465' (-1441) Little Osage @ 4487' (-1463)
Base of KC Marmaton ROP (min/ft) Altamont Pawnee Upper Ft Scott	4500     *     1     4450     *     4400     *     4350			LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: gry/Itan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, fw pcs w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, sm sandy/gritty, tr-nvp, sm SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, swrl SH: gry/brn, silty, sm gritty/sandy like, no cup odr, ns. LS: tan/It gry, fn xln, mostly dense, fw brittle, sm chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, sm SH: gry, silty, med crush, no cup odr, ns. LS: it gry/tan, fn xln, mostly dense, fw brittle, sm chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, sm SH: gry, silty, med crush, no cup odr, ns. LS: gry/It tan, fn xln, sm dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs w/ drk min stns, no fluor/cut, sm SH: gry/grn/blu, silty, tw waxy, no cup odr, ns. LS: gry/lt tan, fn xln, sm dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry, silty, no cup odr, ns. LS: tan/It tan, fn xln, mostly dense, sm brittle, sm chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry, silty, no cup odr, ns. LS: tan/It tan, fn xln, mostly dense, sm brittle, sm chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/drk gry, silty, no cup odr, ns. LS: tan/It tan, fn xln, mostly dense, sm brittle, fw chlky, tr-nvp, svrl SH: gry/drk gry, silty, med crush, no cup odr, ns. LS: tan/It tan, fn xln, mostly dense, sm hard, sm flakey/mealy, tr-nvp, abund Chert: wht/gry, sharp, fw SH: gry/drk gry, sm fissile, no cup odr, ns. LS: tan/gry, fn xln, mostly dense, fw brittle, fw chlky, tr-nvp, sm Chert: wht/opaque, sharp, fw SH: gry/drk gry, sm fis	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406) Pawnee @ 4430' (-1406) Upper Ft. Scott @ 4465' (-1441) Little Osage @ 4487' (-1463)
Base of KC Marmaton ROP (min/ft) Altamont Pawnee Pawnee Ft Scott				LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: gry/Itan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, tr-nvp, sm SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, sm Sandy/gritty, tr-nvp, svrl SH: gry/brn, silty, sm gritty/sandy like, no cup odr, ns. LS: tar/lt gry, fn xln, mostly dense, fw brittle, sm chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, sm SH: gry, silty, med crush, no cup odr, ns. LS: try/tan, fn xln, mostly dense, sm chlky, fw brittle, tr-nvp, sm SH: gry/grn, silty, med crush, no cup odr, ns. LS: gry/itan, fn xln, sm dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs w/ drk min stns, no fluor/cut, sm SH: gry/grn/blu, silty, tw vaxy, no cup odr, ns. LS: tar/lt gry, fw mott, fn xln, sm dense, sm brittle, fw sandy/gritty, tw chlky, tr-nvp, fw SH: gry/brn, silty, no cup odr, ns. LS: tar/lt gry, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry, silty, no cup odr, ns. LS: tar/lt tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/drk gry, silty, no cup odr, ns. LS: tar/lt tan, fn xln, mostly dense, sm hard, fw flakey/mealy, tr-nvp, abund Chert: wht/gry, sharp, fw SH: gry/drk gry, silty, no cup odr, ns. LS: tar/lt tan, fn xln, mostly dense, fw brittle, fw chlky, tr-nvp, sm Chert: wht/opaque, sharp, fw SH: gry/drk gry, sm fissile, no cup odr, ns. LS: tar/lt tan, micro-fn xln, mostly dense, sm brittle fw chlky, tr-nvp, m Chert: wht/opa	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406) Upper Ft. Scott @ 4465' (-1441) Little Osage @ 4487' (-1463) CFS 4514' (30'/60'') Excelle @ 4540' (-1405)
Base of KC Marmaton Marmaton ROP (min/ft) Altamont Pawnee Pawnee Fi Scott	A     450     A     4400     A     4350			LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: gry/Itan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, fw nos pur chlk, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, fw pcs w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, sm sandy/gritty, tr-nvp, sm SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, svrl SH: gry/brn, silty, sm gritty/sandy like, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, sm chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, sm SH: gry, silty, med crush, no cup odr, ns. LS: tar/lt gry, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs wirdtk, sm SH: gry, silty, med crush, no cup odr, ns. LS: gry/tan, fn xln, sm dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs wirdtk min stns, no fluor/cut, sm SH: gry/grn/blu, silty, fw waxy, no cup odr, ns. LS: tar/lt gry, fw mott, fn xln, sm dense, sm brittle, fw sandy/gritty, fw chlky, tr-nvp, fw SH: gry/brn, silty, no cup odr, ns. LS: tan/lt gry, fw mott, fn xln, sm dense, sm brittle, fw sandy/gritty, fw chlky, tr-nvp, fw SH: gry/brn, silty, no cup odr, ns. LS: tan/lt tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry, silty, no cup odr, ns. LS: tan/lt tan, fn xln, mostly dense, sm brittle, fw chlky, fr-nvp, swr SH: gry/drk gry, silty, med crush, no cup odr, ns. LS: tan/lt tan, fn xln, mostly dense, sm brittle, fw chlky, fr-nvp, sm Chert: wht/opaque, sharp, fw SH: gry/drk gry, silty, no cup odr, ns. LS: tan/lt tan, fn xln, mostly dense, fw brittle, fw chlky, tr-nvp, sm Chert: wht/opaque, sharp, fw SH: gry/brn/blk, silty, swr carb, no cup odr, ns. LS: tan/lt tan,	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406) Pawnee @ 4430' (-1406) Little Osage @ 4465' (-1441) Little Osage @ 4487' (-1463) CFS 4514' (30''/60'') Excello @ 4512' (-1488)
Base of KC Marmaton Marmaton Altamont Pawnee Pawnee Fi Scott Fi Scott	A     4500     A     4400     A     4350			LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: gry/itan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, tw pcs w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, sm sandy/gritty, tr-nvp, sm SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, svrl SH: gry/brn, silty, sm gritty/sandy like, no cup odr, ns. LS: tan/lt gry, fn xln, mostly dense, fw brittle, sm chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, sm SH: gry, silty, med crush, no cup odr, ns. LS: tan/lt gry, fn xln, mostly dense, sm chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, sm SH: gry, silty, med crush, no cup odr, ns. LS: gry/tan, fn xln, sm dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs w/ drk min stns, no fluor/cut, sm SH: gry/grn/blu, silty, fw waxy, no cup odr, ns. LS: tan/lt gry, fw mott, fn xln, sm dense, sm brittle, fw sandy/gritty, fw chlky, tr-nvp, fw SH: gry/brn, silty, no cup odr, ns. LS: tan/lt tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry, silty, no cup odr, ns. LS: tan/lt tan, fn xln, mostly dense, sm brittle, sm chlky, fw flakey/mealy, tr-nvp, sund Chert: wht/gry, sharp, fw SH: gry/drk gry, silty, no cup odr, ns. LS: tan/lt tan, fn xln, mostly dense, sm hard, fw flakey/mealy, tr-nvp, swi Chert: wht/gry, sharp, fw SH: gry/drk gry, silty, no cup odr, ns. LS: tan/lt tan, fn xln, mostly dense, sm hard, sm flakey/mealy, tr-nvp, swi Chert: wht/gry, sharp, fw SH: gry/drk gry, silty, no cup odr, ns. LS: tan/lt tan, fn xln, mostly dense, fw brittle, fw chlky, tr-nvp, sm Chert: wht/opaque, sharp, fw SH: gry/drk gry,	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406) Upper Ft. Scott @ 4465' (-1441) Little Osage @ 4465' (-1443) CFS 4514' (30''/60'') Excello @ 4512' (-1488)
Base of KC Marmaton Marmaton Altamont Pawnee Pawnee Fi Scott Fi Scott				LS-crm, micro xin, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: gry/lt tan, fn xin, mostly dense, sm brittle, fw chiky, fw flakey/mealy, tr-nvp, fw pcs pur chik, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/ltan, fn xin, mostly dense, fw brittle, fw chiky, fw flakey/mealy, tr-nvp, fw pcs pur chik, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xin, mostly dense, fw brittle, fw chiky, sm sandy/gritty, tr-nvp, sm SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xin, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, swrl SH: gry/brn, silty, sm gritty/sandy like, no cup odr, ns. LS: tan/t gry, fn xin, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, swrl SH: gry/brn, silty, sm gritty/sandy like, no cup odr, ns. LS: tan/t gry, fn xin, mostly dense, fw brittle, sm chiky, fw flakey/mealy, tr-nvp, fw pcs pur chik, sm SH: gry, silty, med crush, no cup odr, ns. LS: tan/t gry, fn xin, mostly dense, sm brittle, fw brittle, tr-nvp, sm SH: gry/grn, silty, med crush, no cup odr, ns. LS: tan/t gry, fw mott, fn xin, sm dense, sm brittle, fw flakey/mealy, tr-nvp, fw pcs wi drk min stns, no fluor/cut, sm SH: gry/grn/blu, silty, fw waxy, no cup odr, ns. LS: tan/t gry, fm xint, fn xin, sm dense, sm brittle, fw flakey/mealy, tr-nvp, fw pcs pur chik, fw SH: gry, silty, no cup odr, ns. LS: tan/t tan, fn xin, mostly dense, sm brittle, fw chiky, fw flakey/mealy, tr-nvp, fw pcs pur chik, fw SH: gry, silty, no cup odr, ns. LS: tan/t tan, fn xin, mostly dense, sm brittle, fw chiky, fw- flakey/mealy, tr-nvp, fw pcs pur chik, fw SH: gry/drk gry, silty, no cup odr, ns. LS: tan/t tan, fn xin, mostly dense, sm brittle, fw chiky, tr-nvp, sm fissile, no cup odr, ns. LS: tan/t tan, fn xin, mostly dense, sm brittle, fw chiky, tr-nvp, sm fissile, no cup odr, ns. LS: tan/t tan, fn xin, mostly dense, sm brittle, fw chiky, tr-nvp, m Chert: gry/smokey, sharp,	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406) Pawnee @ 4430' (-1406) Little Osage @ 4465' (-1441) Little Osage @ 4487' (-1463) CFS 4514' (30''/60'') Excello @ 4512' (-1488)
Base of KC Marmaton Marmaton Altamont Pawnee Pawnee Ft Scott Ft Scott Ft Scott				LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: gry/lt tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, tr-nvp, sm SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, fw pcs w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, sm SH: gry/brn, silty, sn gritty/sandy like, no cup odr, ns. LS: tar/lt gry, fn xln, mostly dense, fw brittle, sm chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, sm SH: gry, silty, med crush, no cup odr, ns. LS: tar/lt gry, fn xln, mostly dense, sm chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, sm SH: gry/grn, sm SH: gry/grn, silty, mostly dense, sm chlky, fw flakey/mealy, tr-nvp, fw pcs wi drk min stns, no fluor/cut, sm SH: gry/grn/blu, silty, fw waxy, no cup odr, ns. LS: tar/lt tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs wi drk min stns, no fluor/cut, sm SH: gry/grn/blu, silty, fw waxy, no cup odr, ns. LS: tar/lt tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry, silty, no cup odr, ns. LS: tar/lt tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/drk gry, silty, no cup odr, ns. LS: tar/lt tan, fn xln, mostly dense, sm hard, sm flakey/mealy, tr-nvp, swi Chert: wht/gry, sharp, fw SH: gry/drk gry, silty, no cup odr, ns. LS: tar/lt tan, fn xln, mostly dense, sm hard, sm flakey/mealy, tr-nvp, swi Chert: wht/gry, sharp, fw SH: gry/brn/blk, silty, fw carb, no cup odr, ns. LS: tar/lt gry, fn xln, mostly dense, sm brittle, fw chlky, tr-nvp, w Chert: gry/smokey, sharp, fw SH: gry/br	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406) Pawnee @ 4430' (-1406) Little Osage @ 4465' (-1441) Little Osage @ 4487' (-1463) CFS 4514' (30''/60'') Excello @ 4512' (-1488) Cherokee @ 4543' (-1519)
Base of KC Marmaton Marmaton Attamont Pawnee Pawnee Ft Scott Ft Scott Excello SH	4550 <sup>*</sup>   <sup>*</sup> 4350   <sup>*</sup> 4350   <sup>*</sup> 4350   <sup>*</sup> 4350   <sup>*</sup>			LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: gry/it tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, fw pcs w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, fw chlky, fw flakey/mealy, fw pcs w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, sm SH: gry/brn, silty, no cup odr, ns. LS: gry/tan, fn xln, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, sm SH: gry/brn, silty, sm gritty/sandy like, no cup odr, ns. LS: tar/lt gry, fn xln, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, sm SH: gry/grn, silty, med crush, no cup odr, ns. LS: tray/lt tan, fn xln, sm dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs w/ drk min stns, no fluor/cut, sm SH: gry/grn/blu, silty, fw waxy, no cup odr, ns. LS: tra/lt gry, fw mott, fn xln, sm dense, sm brittle, fw sandy/gritty, w chlky, t-nvp, fw pcs w/ chk, fw SH: gry, silty, no cup odr, ns. LS: tar/lt tan, fn xln, mostly dense, sm brittle, fw chlky, fw flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry, silty, no cup odr, ns. LS: tar/lt far, fn xln, mostly dense, sm brittle, fw chlky, fw- flakey/mealy, tr-nvp, fw pcs pur chlk, fw SH: gry, silty, no cup odr, ns. LS: tar/lt far, fn xln, mostly dense, sm brittle, fw chlky, fr-nvp, sw Chert: wht/opaque, sharp, fw SH: gry/drk gry, silty, no cup odr, ns. LS: tar/lt fan, fn xln, mostly dense, sm brittle, fw chlky, fr-nvp, sw Chert: wht/opaque, sharp, fw SH: gry/bri/blk, silty, swr carb, no cup odr, ns. LS: tar/lt fan, fn xln, mostly dense, sm brittle, fw chlky, tr-nvp, fw Chert: gry/smokey, sharp, fw SH: gry/bri/blk, silty, fw carb, no cup odr, ns. L	B/KC @ 4331' (-1307)         John Goldsmith took over         Geologic Responsibilities on         location from from Steve Carl         who was filling in.         Marmaton @ 4362' (-1338)         Altamont @ 4413' (-1389)         Pawnee @ 4430' (-1406)         Upper Ft. Scott @ 4465' (-1441)         Little Osage @ 4487' (-1463)         CFS 4514' (30''/60'')         Excello @ 4512' (-1488)         Cherokee @ 4543' (-1519)
Base of KC Marmaton ROP (min/ft) Altamont Pawnee Pawnee Ft Scott Ft Scott Ft Scott Excello SH Vertigris				LS-crm, micro xin, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srid, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: grylit an, fn xin, mostly dense, sm brittle, fw chiky, fw flakey/mealy, tr-nvp, fw pcs pur chik, fw SH: grylbrn, silty, no cup odr, ns. LS: gryltan, fn xin, mostly dense, fw brittle, fw chiky, fw flakey/mealy, tw pcs w/ pr vug por, fw SH: brn'gry, silty, no cup odr, ns. LS: gryltan, fn xin, mostly dense, fw brittle, fw chiky, fw flakey/mealy, tw pcs w/ pr vug por, fw SH: brn'gry, silty, no cup odr, ns. LS: gryltan, fn xin, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, sm SH: grylbrn, silty, sm gritty/sandy like, no cup odr, ns. LS: gryltan, fn xin, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, sm SH: grylbrn, silty, sm gritty/sandy like, no cup odr, ns. LS: tarylit gry, fn xin, mostly dense, sm brittle, sm chiky, fw flakey/mealy, tr-nvp, fw pcs pur chik, sm SH: gry, silty, med crush, no cup odr, ns. LS: grylit an, fn xin, sm dense, sm brittle, fw chiky, fw flakey/mealy, tr-nvp, fw pcs w/ drk min stns, no fluor/cut, sm SH: gry/grn/blu, silty, fw waxy, no cup odr, ns. LS: tarylit gry, fn xin, mostly dense, sm brittle, fw chiky, fw flakey/mealy, tr-nvp, fw pcs pur chik, fw SH: gry, silty, no cup odr, ns. LS: tarylit an, fn xin, mostly dense, sm brittle, fw chiky, fw flakey/mealy, tr-nvp, fw pcs pur chik, fw SH: gry, silty, no cup odr, ns. LS: tarylit an, fn xin, mostly dense, sm brittle, fw chiky, fw flakey/mealy, tr-nvp, fw pcs pur chik, fw SH: gry, silty, no cup odr, ns. LS: tarylit an, fn xin, mostly dense, sm hard, fw flakey/mealy, tr-nvp, swl Chet: whi/gry, sharp, fw SH: gry/drk gry, silty, no cup odr, ns. LS: tarylity, fn xin, mostly dense, sm hard, fw flakey/mealy, tr-nvp, wor Chet: whi/gry, sharp, fw SH: gry/br/blk, silty, fw carb, no cup odr, ns. LS: tarylity, fn xin, mostly dense, sm brittle, fw chiky, tr-nvp, sm Chet: whi/opaque, sharp, abund SH: gry/br	B/KC @ 4331' (-1307)         John Goldsmith took over         Geologic Responsibilities on         location from from Steve Carl         who was filling in.         Marmaton @ 4362' (-1338)         Altamont @ 4413' (-1389)         Pawnee @ 4430' (-1406)         Upper Ft. Scott @ 4465' (-1441)         Little Osage @ 4487' (-1463)         CFS 4514' (30'/60'')         Excello @ 4512' (-1488)         DST #2 "Johnson" 4563-4602 529201 30-150 990         SCFF A514' (30'/60'')         Excello @ 4512' (-1488)         Cherokee @ 4543' (-1519)         DST #2 "Johnson" 4563-4602 518 (-1488)
Base of KC Marmaton Altamont Pawnee Pawnee Upper Ft Scott Little Osage SH Ft Scott Ft Scott Excello SH Vertigris				LS-crm, micro xin, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vin grn, well srid, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vin grn as above, arg cement, semi friable, no cup odr, ns. LS: grylit an, fn xin, mostly dense, sm brittle, fw chiky, fw flakey/mealy, throup, fw pos pur chik, fw SH: grybrn, silty, no cup odr, ns. LS: gryltan, fn xin, mostly dense, fw brittle, fw chiky, fw flakey/mealy, fw pos w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: gryltan, fn xin, mostly dense, fw brittle, fw chiky, fw flakey/mealy, fw pos w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: gryltan, fn xin, mostly dense, fw brittle, sm sandy/gritty, tr-mp, sm SH: grybrn, silty, sm gritty/sandy like, no cup odr, ns. LS: tryltan, fn xin, mostly dense, fw brittle, sm sandy/gritty, tr-mp, sm SH: grybrn, silty, sm gritty/sandy like, no cup odr, ns. LS: tan/t gry, fn xin, mostly dense, fw brittle, sm sandy/gritty, tr-mp, sm SH: grygrn, silty, sm gritty/sandy like, no cup odr, ns. LS: tan/tgry, fn xin, mostly dense, sm chiky, fw flakey/mealy, tr-mp, fw pos pur chik, sm SH: gry, silty, med crush, no cup odr, ns. LS: grylit an, fn xin, sm dense, sm brittle, fw chiky, fw flakey/mealy, tr-mp, fw pos pur chik, fw SH: gry, silty, no cup odr, ns. LS: tan/tgry, fn xin, mostly dense, sm brittle, fw sandy/gritty, fw chiky, tr-mp, fw SH: grybrn, silty, no cup odr, ns. LS: tan/tgry, fn xin, mostly dense, sm brittle, fw chiky, tr-mp, swl SH: gry/drk gry, silty, med crush, no cup odr, ns. LS: tan/tgry, fn xin, mostly dense, sm brittle, fw chiky, tr-mp, swl SH: gry/drk gry, silty, dense, sm brittle, fw chiky, tr-mp, swl SH: gry/drk gry, silty, dense, sm brittle, fw chiky, tr-mp, swl SH: gry/drk gry, silty, med rush, no cup odr, ns. LS: tan/tgry, fn xin, mostly dense, sm brittle fw chiky, tr-mp, m Chert: wht/grap, sharp, fw SH: grybin/bik, silty, w carb, no cup odr, ns. LS: tan/tgry, fn xin, mostly dense, sm brittle fw chiky, tr-mp, m Chert: gryismokey, sharp, fw SH: grybin/bik,	B/KC @ 4331' (-1307)         John Goldsmith took over         Geologic Responsibilities on         location from from Steve Carl         who was filling in.         Marmaton @ 4362' (-1338)         Altamont @ 4413' (-1389)         Pawnee @ 4430' (-1406)         Upper Ft. Scott @ 4465' (-1441)         Little Osage @ 4487' (-1463)         CFS 4514' (30''/60'')         Excello @ 4512' (-1488)         Cherokee @ 4543' (-1519)         DST #2 ''Johnson'' 4663-4602 5292013 30-45 60-90 185 Opt 52 001 185 (-1441)         CFS 4514' (30''/60'')         Excello @ 4512' (-1488)         Cherokee @ 4543' (-1519)         DST #2 ''Johnson'' 4663-4602 5292013 30-45 60-90 185 Opt 51008 in 10'' 1970 PER SUB 51 1008 in 10''' 1970 PER SUB 51 1008 in 10'''' 1970 PER SUB 51 1008 in 10''''''
Base of KC Marmaton Marmaton Altamont Pawree Pawree Fi Scott Fi Scott Excello SH Vertigris Vertigris				LS-cm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-brick red, vfn grn, well srld, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: grylitt an, fn xln, mostly dense, sm brittle, fw chiky, fw flakey/mealy, tr-nvp, fw pcs pur chik, fw SH: grylbrn, silty, no cup odr, ns. LS: grylita, fn xln, mostly dense, fw brittle, fw chiky, fw flakey/mealy, tr-nvp, sm SH: grylbrn, silty, no cup odr, ns. LS: gryltan, fn xln, mostly dense, fw brittle, fw chiky, sm sandy/gritty, tr-nvp, sm SH: grylbrn, silty, no cup odr, ns. LS: gryltan, fn xln, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, swrl SH: grylbrn, silty, sm gritty/sandy like, no cup odr, ns. LS: taryltan, fn xln, mostly dense, fw brittle, sm chiky, fw flakey/mealy, tr-nvp, fw pcs pur chik, sm SH: gry, silty, med crush, no cup odr, ns. LS: taryltan, fn xln, mostly dense, sm brittle, fw chiky, fw flakey/mealy, tr-nvp, fw pcs pur chik, sm SH: gry, silty, med crush, no cup odr, ns. LS: taryltan, fn xln, mostly dense, sm brittle, fw chiky, fw flakey/mealy, tr-nvp, fw pcs w/ drk min stns, no fluor/cut, sm SH: grygrmblu, silty, fw waxy, no cup odr, ns. LS: tarylt an, fn xln, mostly dense, sm brittle, fw sandy/gritty, fw chiky, tr-nvp, fw SH: grylbrn, silty, no cup odr, ns. LS: tarylt an, fn xln, mostly dense, sm brittle, fw chiky, fw flakey/mealy, tr-nvp, fw pcs pur chik, fw SH: gry, silty, no cup odr, ns. LS: tarylt tar, fn xln, mostly dense, sm brittle, fw chiky, fw flakey/mealy, tr-nvp, fw pcs pur chik, fw SH: grylork, gry, silty, no cup odr, ns. LS: tarylt tan, fn xln, mostly dense, sm brittle, fw chiky, tr-nvp, sm SH: gryl/mku, gry, silty, med crush, no cup odr, ns. LS: tarylt tan, fn xln, mostly dense, sm hard, fw flakey/mealy, tr-nvp, swolt Chert: wht/ograue, sharp, fw SH: grylork gry, silty, no cup odr, ns. LS: tarylt tar, fn xln, mostly dense, sm brittle, fw chiky, tr-nvp, sm Chert: wht/opaque, sharp, fw SH: grylork kigry, shry, no cup odr, ns. LS: tary	B/KC @ 4331' (-1307)         John Goldsmith took over         Geologic Responsibilities on         location from from Steve Carl         who was filling in.         Marmaton @ 4362' (-1338)         Altamont @ 4413' (-1389)         Pawnee @ 4430' (-1406)         Upper Ft. Scott @ 4465' (-1441)         Little Osage @ 4465' (-1441)         CFS 4514' (30'/60'')         Excello @ 4512' (-1488)         Cherokee @ 4543' (-1519)         DST #2 ''Johnson'' 4563-4602' 522019: 3'-456-090         Stop = WSB bit to BOB in 8.5'' (15'' BB)         Cherokee @ 4543' (-1519)         Cherokee @ 4543' (-1519)         BST (15'' BB) 200 BB)         Presser WSB bit to BOB in 8.5'' (15'' BB)         Syst (15'' BB) 200 BB)         Physic BB)         Cherokee @ 4543' (-1519)
Base of KC Marmaton Marmaton Altamont Pawnee Pawnee Pawnee FI Scott FI Scott Excello SH Vertigris Vertigris Cherokee SH				LS-crm, micro xh, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-brick red, vhn grn as above, arg cement, semi friable, no cup odr, ns. LS: grylit tan, fn xhn, mostly dense, sm brittle, fw chiky, fw flakey/medy, tr-nvp, fw post pur chik, fw SH: grybrn, silty, no cup odr, ns. LS: grylitan, fn xhn, mostly dense, fw brittle, fw chiky, fw flakey/medy, tw post w/ pr vug por, fw SH: bringry, silty, no cup odr, ns. LS: grylitan, fn xhn, mostly dense, fw brittle, wo chiky, fw flakey/medy, fw post w/ pr vug por, fw SH: bringry, silty, no cup odr, ns. LS: grylitan, fn xhn, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, sm SH: grylbrn, silty, sm gritty/sandy like, no cup odr, ns. LS: grylitan, fn xhn, mostly dense, fw brittle, sm chiky, fw flakey/medy, tr-nvp, fw post pur chik, sm SH: gry, silty, med crush, no cup odr, ns. LS: trylitan, fn xhn, mostly dense, sm brittle, fw chiky, fw flakey/medy, tr-nvp, fw post with and the thick, fw flakey/medy, tr-nvp, fw post with and the the thick, fw flakey/medy, tr-nvp, fw post with and the thick, fw flakey/medy, tr-nvp, fw post with and the thick, fw flakey/medy, tr-nvp, fw post with and the thick, fw flakey/medy, tr-nvp, fw post pur chik, fw SH: gryldrk, fw flakey/medy, tr-nvp, aburd the se, sm brittle, fw chiky, fw flakey/medy, tr-nvp, aburd there, sm hard, fw flakey/medy, tr-nvp, abund Chert: wht/gry, sharp, fw SH: gryldrk gry, silty, no cup odr, ns. LS: tan/lt tan, fn xhn, mostly dense, sm hard, fw flakey/medy, tr-nvp, word, fast. LS: tan/lt tan, micro-f nin, mostly dense, sm brittle, fw chiky, tr-nvp, m Chert: grylans, sharp, fw SH: grylbrn/blk, silty, fw carb, no cup odr, ns. LS: tan/lt tan, filt, mostly dense, sm brittle, fw chiky, sm brittle, wribit, si	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on Iocation from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406) Pawnee @ 4430' (-1406) Upper Ft. Scott @ 4465' (-1441) Little Osage @ 4487' (-1463) CFS 4514' (30'/60'') Excello @ 4512' (-1488) CFS 4514' (30'/60'') Excello @ 4512' (-1488) Cherokee @ 4543' (-1519) DST #2 ''Johnson'' 4563-4602' 5292013 30-45-60-90 1st Open = 1/3' Bik, bit to BOB in 8.5' (15'' BB) 20 Opt = 1/3' Bik, bit to BOB in 8.5' (15'' BB) 20 Opt = 1/3' Bik, bit to BOB in 8.5' (15'' BB) 20 Opt = 1/3' Bik, bit to BOB in 8.5' (15'' BB) 21 Opt = 1/3' Bik, bit to BOB in 8.5' (15'' BB) 21 Opt = 1/3' Bik, bit to BOB in 8.5' (15'' BB) 21 Opt = 1/3' Bik, bit to BOB in 8.5' (15'' BB) 21 Opt = 1/3' Bik, bit to BOB in 8.5' (15'' BB) 21 Opt = 1/3' Bik, bit to BOB in 8.5' (15'' BB) 21 Opt = 1/3' Bik, bit to BOB in 8.5' (15'' BB) 21 Opt = 1/3' Bik, bit to BOB in 8.5' (15'' BB) 21 Opt = 1/3' Bik, bit to BOB in 8.5' (15'' BB) 21 Opt = 1/3' Bik, bit to BOB in 8.5' (15'' BB) 21 Opt = 1/3' Bik, bit to BOB in 8.5' (15'' BB) 21 Opt = 1/3' Bik, bit to BOB in 8.5' (15'' BB) 21 Opt = 1/3' Bik, bit to BOB in 8.5' (15'' BB) 21 Opt = 1/3' Bik, bit to BOB in 8.5' (15'' BB) 21 Opt = 1/3' Bik, bit to BOB in 8.5' (15'' BB) 21 Opt = 1/3' Bik, bit to BOB in 8.5' (15'' BB) 21 Opt = 1/3' Bik, bit to BOB in 8.5' (15'' BB) 21 Opt = 1/3' Bik, bit to BOB in 8.5' (15'' BB) 21 Opt = 1/3' Bik, bit to BOB in 8.5' (15'' BB) 21 Opt = 228'' 1008'' 21 Opt = 228'' 1008'' 21 Opt = 228'' 1008'' 21 Opt = 228'' 21 Opt = 21 Op
Base of KC Base of KC Marmaton Marmaton Altamont Pawnee Pawnee Fi Scott Fi Scott Krebs Cherokee SH Krebs DST #2 Johnson				LS-crm, micro xln, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vfn grn, well srtd, sub round, cale matrix, striated red/gray, no cup odr, ns. SS-brick red, vfn grn as above, arg cement, semi friable, no cup odr, ns. LS: grylit tan, fn xln, mostly dense, sm brittle, fw chiky, fw flakey/mealy, tr-nvp, fw pcs pur chik, fw SH: grylbrn, silty, no cup odr, ns. LS: grylitan, fn xln, mostly dense, fw brittle, fw chiky, fw flakey/mealy, fw pcs w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: grylitan, fn xln, mostly dense, fw brittle, fw chiky, fw flakey/mealy, fr-nvp, sm SH: grylbrn, silty, no cup odr, ns. LS: grylitan, fn xln, mostly dense, fw brittle, sm sandy/gritty, tr-nvp, sml SH: grylbrn, silty, sm gritty/sandy like, no cup odr, ns. LS: tarylf gry, fn xln, mostly dense, fw brittle, sm chiky, fw flakey/mealy, tr-nvp, fw pcs pur chik, sm SH: gry, silty, med crush, no cup odr, ns. LS: tarylf and, fn xln, mostly dense, sm brittle, fw chiky, fw flakey/mealy, tr-nvp, fw pcs w/ drk min stms, no fluor/cut, sm SH: grygrin, silty, med crush, no cup odr, ns. LS: grylit tan, fn xln, sm dense, sm brittle, fw chiky, fw flakey/mealy, tr-nvp, fw pcs w/ drk min stms, no fluor/cut, sm SH: grygring, fw mostly dense, sm brittle, fw chiky, fr-nvp, sml SH: grygring, silty, med crush, no cup odr, ns. LS: tan/lit tan, fn xln, mostly dense, sm brittle, fw chiky, fr-nvp, sml SH: grygring, silty, med crush, no cup odr, ns. LS: tan/lit tan, fn xln, mostly dense, sm brittle, fw chiky, fr-nvp, sml SH: grygrinky, shap, fw SH: gry/drk gry, silty, no cup odr, ns. LS: tan/lit tan, fn xln, mostly dense, sm brittle, fw chiky, tr-nvp, sml SH: grygrink, shap, hw SH: gry/drk gry, silty, no cup odr, ns. LS: tan/lit tan, fn xln, mostly dense, sm brittle, fw chiky, tr-nvp, sm Chet: whi/opaque, shap, fw SH: gry/brn/blk, silty, w carb, no cup odr, ns. LS: tan/lit gry, fn xln, wostly dense, sm brittle, fw chiky, tr-nvp, sm Chet: whi/opaque, shap, hw SH: gry/brn/blk, silty, fw carb, no cup odr, ns. LS: tan/lit gry, fn xln, w	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406) Upper Ft. Scott @ 4465' (-1441) Little Osage @ 4487' (-1463) CFS 4514' (30"/60") Excello @ 4512' (-1488) Cherokee @ 4543' (-1519) DST #2 "Johnson" 4563-4602 5292013 30-4560-90 1st Open = 1%T Bbx, bit to BOB in 85° (Open B) BFT 122' "Johnson" 4563-4602 5292013 30-4560-90 1st Open = 1%T Bbx, bit to BOB in 85° (Open B) BFT 122''' Stat Muld (20°C) (3%) Open = WSB bit to BOB in 85° (Open B) BFT 122''' Stat Muld (20°C) (4%) Ol, 19% WTR, 19% Muld Johnson @ 4588' (-1564)
Base of KC Marmaton Marmaton Altamont Pawnee Pawnee Pawnee Pawnee Fi Scott Fi Scott Vertigris Vertigris Cherokee SH				LS-crm, micro xin, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vin grn, well srid, sub round, calc matrix, striated red/gray, no cup odr, ns. SS-brick red, vin gm as above, arg cement, semi friable, no cup odr, ns. LS: grylittan, fn xin, mostly dense, sm brittle, fw chiky, fw flakey/meaky, tr-nvp, fw pos pur chik, fw SH: grybrn, silty, no cup odr, ns. LS: grylitan, fn xin, mostly dense, fw brittle, fw chiky, fw flakey/meaky fw pos w/ pr vug por, fw SH: brn/gry, silty, no cup odr, ns. LS: grylitan, fn xin, mostly dense, fw brittle, fw chiky, sm sandy/gritty, tr-nvp, sm SH: grybrn, silty, no cup odr, ns. LS: grylitan, fn xin, mostly dense, fw brittle, sm chiky, fw flakey/meaky fw pos w/ pr vug por, fw SH: brn/gry, silty, med crush, no cup odr, ns. LS: grylitan, fn xin, mostly dense, fw brittle, sm chiky, fw flakey/meaky tr-nvp, fw pos pur chik, sm SH: gry, silty, med crush, no cup odr, ns. LS: grylitan, fn xin, mostly dense, sm brittle, fw chiky, fw flakey/meaky tr-nvp, fw pos w/ drk min sins, no fluoricul; sm SH: grygrn/bu, silty, med crush, no cup odr, ns. LS: grylitan, fn xin, sm dense, sm brittle, fw chiky, fw flakey/meaky tr-nvp, fw pos yu chik, fw SH: gry, silty, no cup odr, ns. LS: travitit tar, fn xin, mostly dense, sm brittle, fw chiky, fw flakey/meaky tr-nvp, fw pos pur chik, fw SH: gry, silty, no cup odr, ns. LS: tar/it tar, fn xin, mostly dense, sm brittle, fw chiky, fw flakey/meaky, tr-nvp, fw pos pur chik, fw SH: gry/drk gry, silty, no cup odr, ns. LS: tar/it tar, fn xin, mostly dense, sm brittle, fw chiky, tr-nvp, surl SH: gry/drk gry, silty, med crush, no cup odr, ns. LS: tar/it tar, fn xin, mostly dense, sm brittle, fw chiky, tr-nvp, sm Chert: wht/opaque, sharp, fw SH: gry/drk gry, sm fissile, no cup odr, ns. LS: tar/it tar, fn xin, mostly dense, sm brittle, fw chiky, tr-nvp, fw Chert: gryismokey, sharp, fw SH: gry/brn/isk, silty, fw carb, no cup odr, ns. LS: tar/it tar, fn xin, mostly dense, sm brittle, fw chiky, fw flakey/meaky, fw chert, grywhr, sharp, sm SH: gryybribk	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406) Upper Ft. Scott @ 4465' (-1441) Little Osage @ 4465' (-1441) CFS 4514' (30'/60'') Excello @ 4512' (-1488) CFS 4514' (30'/60'') Excello @ 4512' (-1488) DST #2 "Johnson" 4663-4602 5929013 30-46-90 30 1st Open = 14" Blw, bit to BOB in 85" (15" BB) 2nd Open = 14" Blw, bit to BOB in 10" (BOB BB) 2nd Open = 14" Blw, bit to BD Bin 10" (BOB BB) 2nd Open = 14"
Base of KC Marmaton Marmaton Pawnee Pawnee Pawnee Pawnee Fi Scott Fi Scott Fi Scott Krebs Cherokee SH Vertigris Vertigris DST #2				LS-crm, micro xin, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vin grn, well srtd, sub round, calc matrix, striated real/gray, no cup odr, ns. SS-brick red, vin grn as above, arg cement, semi friable, no cup odr, ns. LS: grylitan, fn xin, mostly dense, sm brittle, fw chiky, fw flakey/meaky, tr-nvp, fw pos pur chik, fw SH: grybrn, silty, no cup odr, ns. LS: grylitan, fn xin, mostly dense, fw brittle, fw chiky, fw flakey/meaky fw pos w/ pr vup por, fw SH: brirgry, silty, no cup odr, ns. LS: grylitan, fn xin, mostly dense, fw brittle, fw chiky, sm sandygritty, tr-nvp, sm SH: grybrn, silty, no cup odr, ns. LS: grylitan, fn xin, mostly dense, fw brittle, sm sandyigritty, tr-nvp, smi SH: grybrn, silty, sm gritty/sandy like, no cup odr, ns. LS: lan/lt gry, fn xin, mostly dense, fw brittle, sm chiky, fw flakey/meaky tr-nvp, it pos pur chik, sm SH: gry, silty, med crush, no cup odr, ns. LS: lan/lt gry, fn xin, mostly dense, sm brittle, sm chiky, fw flakey/meaky tr-nvp, fw pos wird kin sin stns, no fluor/cut, sm SH: gryigrn, silty, med crush, no cup odr, ns. LS: lt grylitan, fn xin, sm dense, sm brittle, fw chiky, fw flakey/meaky tr-nvp, fw pos wird kin sin stns, no fluor/cut, sm SH: gryigrn/blu, silty, fw waxy, no cup odr, ns. LS: lt tan/lt gry, fw mott, fn xin, sm dense, sm brittle, fw sandyigritty, wirdiky, fm xin, sm dense, sm brittle, fw sandyigritty, wirdiky, fm xin, sm dense, sm brittle, fw sandy gryn, fw pos pur chik, fw SH: grydrk gry, silty, no cup odr, ns. LS: tan/lt tan, fn xin, mostly dense, sm brittle, fw flakey/meaky, tr-nvp, fw pos pur chik, fw SH: grydrk gry, silty, no cup odr, ns. LS: tan/lt tan, fn xin, mostly dense, sm brittle, fw chiky, tr-nvp, and Chet: whit/grys sharp, fw SH: grydrk gry, sm fissile, no cup odr, ns. LS: tan/lt gry, fn xin, mostly dense, fw brittle, fw chiky, tr-nvp, m Chet: whit/grys, sharp, fw SH: grydrin blk, silty, ser at horit gry m xin, mostly dense, sm brittle, fw chiky, fw flakey/meaky, tr-nvp, fw Chet: grywinh, fass, sharp, fw SH: gryforblk, silty, c	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406) Pawnee @ 4430' (-1406) Little Osage @ 4465' (-1441) Little Osage @ 4487' (-1463) CFS 4514' (30'/60'') Excello @ 4512' (-1488) CFS 4514' (30'/60'') Excello @ 4512' (-1488) DST #2 "Johnson" 4653-4602 5292013 au-96-905 1st Open = 148' Blw, bit to BOB in 85'' (1.9' BB) 2nd Open = 148' Blw, bit to BOB in 85'' (1.9'' BB) Prote 22# F59-1009 FFD-12-1109 DST #2 "Johnson" 4563-4602 5292013 au-96-905 1st Open = 148' Blw, bit to BOB in 85'' (1.9'' BB) 2nd Open = 148' Blw, bit to BOB in 10'' (BOB BB) IFP-12-1109 FFD-12-22# F59-1009 FFD-12-22# F59-109 FFD-12-22# F59-1009 FFD-12-22# F59-109 FFD-12-22# F59-109 FFD-12-22# F
Base of KC Marmaton Marmaton Pawnee Pawnee Pawnee Pawnee Pawnee Pawnee Pawnee Pawnee Pawnee Data Cherokee SH Krebs DST #2 DST #2				LS-cm, micro xin, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-drity gry, vin grn, well srid, sub round, cale matrix, striated redgrag, no cup odr, ns. SS-brick red, vin grn as above, arg cament, semi friable, no cup odr, ns. LS: grylitt an, fn xin, mostly dense, arg brittle, fw chiky, fw flakeyimeaky, tr-nvp, iw pos pur chik, W SH: grybrn, ally, no cup odr, ns. LS: grylita, nn xin, mostly dense, fw brittle, fw chiky, fw flakeyimeaky, tr-nvp, sm SH: grybrn, silty, no cup odr, ns. LS: grylita, fn xin, mostly dense, fw brittle, fw chiky, sm sandygritty, tr-nvp, sm SH: grybrn, silty, no cup odr, ns. LS: grylita, fn xin, mostly dense, fw brittle, sm chiky, fw flakeyimeaky, tr-nvp, km Sptur, silty, sm gritty-sandy like, no cup odr, ns. LS: tarylity, tr-nvp, tw pos pur chik, sm SH: gry, grytan, fn xin, mostly dense, sm brittle, fw chiky, fw flakeyimeaky, tr-nvp, kw pos pur chik, sm SH: gry, grytan, fn xin, mostly dense, sm brittle, fw chiky, fw flakeyimeaky, tr-nvp, kw pos pur chik, sm SH: grygrymibu, silty, mo cup odr, ns. LS: grylit tan, fn xin, mostly dense, sm brittle, fw chiky, fw flakeyimeaky, tr-nvp, kw pos pur chik, sm SH: grygrinbu, silty, no cup odr, ns. LS: tarylitt gry, fw mott, fn xin, sm dense, sm brittle, fw sandygritty, fw chiky, tr-nvp, fw pos pur chik, fw SH: gry, silty, no cup odr, ns. LS: tarylitt gry, fw mott, fn xin, sm dense, sm brittle, fw sandygritty, fw chiky, tr-nvp, fw pos pur chik, fw SH: grydrik gry, silty, no cup odr, ns. LS: tarylitt an, fn xin, mostly dense, sm brittle, fw chiky, fr- son, post Ocher: whitgry, sharp, fw SH: grydrik gry, silty, no cup odr, ns. LS: tarylitt an, fn xin, mostly dense, sm brittle, fw chiky, tr-nvp, sm Chert: whitopaque, sharp, fw SH: grydrik gry, silty, no cup odr, ns. LS: tarylitt an, fn xin, mostly dense, sm brittle, fw chiky, tr-nvp, m Chert: whitopaque, sharp, fw SH: grydrik gry, sm fisie, no cup odr, ns. LS: tarylitt gry, fn xin, mostly dense, sm brittle, fw chiky, fw flakeyimeaky, thw ny, tw foss frags, mostly dense, fw chiky, fw chert, o	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilites on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406) Pawnee @ 4430' (-1406) Little Osage @ 4465' (-1441) Little Osage @ 4487' (-1463) CFS 4514' (30''/60'') Excello @ 4512' (-1488) CFS 4514' (30''/60'') Excello @ 4512' (-1488) Cherokee @ 4543' (-1519) DST #2 ''.ohnson'' 4563-4602 S222013 30-48-609 15 (Op BB) 20 (Op C) HPD-12-22# F29-109# HYDP-227228# 15 (Op SH2 Total Fluid, 307 GO (15 FB) 20 (Op C) HYDP-27228# 15 (Op SH2 Total Fluid, 307 GO (15 FB) 20 (Op C) HYDP-27228# 15 (Op SH2 Total Fluid, 307 GO (15 FB) 20 (Op C) SURVEY, 114 (15 FB) 100 (15 FB) 20 (Op C) 100 (15 FB) 20 (Op C) 20 (15 FB) 20 (15 FB) 20 (15 FB) 20 (15 FB) 20 (15 FB) 20 (15 FB) 20
Base of KC Marmaton Marmaton Pawnee Pawnee Pawnee Pawnee Fi Sott Excello SH Vertigris Krebs DST #2 Norrow				LS-crm, micro xin, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-drity gry, vin grn, well srid, sub round, calc matrix, striated redgray, no cup odr, ns. SS-brick red, vin grn as above, arg cament, semi friable, no cup odr, ns. LS: grylitan, in xin, mostly dense, arb britle, fw chlky, fw fakey/meaky, throny, fw pcs pur chik, fw SH: grybrn, silty, no cup odr, ns. LS: grylitan, in xin, mostly dense, in w britle, fw chlky, fw fakey/meaky throny, sm SH: grybrn, silty, no cup odr, ns. LS: grylitan, in xin, mostly dense, in w britle, fw chlky, sm sandygritty, throny, sm SH: grybrn, silty, no cup odr, ns. LS: grylitan, in xin, mostly dense, in w britle, sm chlky, fw fakey/meaky, throny, tw pcs pur chik, sm SH: gry, silty, med crush, no cup odr, ns. LS: tarylitg, throny, tw pcs pur chik, sm SH: gry, silty, med crush, no cup odr, ns. LS: tarylitan, in xin, mostly dense, sm chlky, fw thitle, throny, sm SH: grygrin, silty, med crush, no cup odr, ns. LS: grylit tan, in xin, mostly dense, sm brittle, fw chlky, fw fakey/meaky throny, by pcs w/ drk min sins, no fluor/cut, sm SH: grygring, silty, throny, thr pcs pur chik, w SH: gry, silty, no cup odr, ns. LS: tarylitan, in xin, mostly dense, sm brittle, fw chlky, fw fakey/meaky throny, by pcs pur chik, W SH: gry, silty, no cup odr, ns. LS: tarylitan, fn xin, mostly dense, sm brittle, sm chlky, fw fakey/meaky throny, tw pcs pur chik, W SH: gry, silty, no cup odr, ns. LS: tarylitan, fn xin, mostly dense, sm brittle, fw chlky, throny, sm CH: grydrid gry silty, med crush, no cup odr, ns. LS: tarylitan, fn xin, mostly dense, sm brittle, fw chlky, throny, sm CH: grydrid gry silty, med crush, no cup odr, ns. LS: tarylitan, fn xin, mostly dense, sm brittle, fw chlky, throny, sm CH: twittopaque, sharp, fw SH: grydrid gry, sm fissile, no cup odr, ns. LS: tarylitan, fn xin, mostly dense, sm brittle, fw chlky, fw fakey/meaky, throny, fw CH: grybrn/bik, silty, fw carb, no cup odr, ns. LS: tarylitan, fn xin, mostly dense, sm brittle, fw chlky, fw fakey, neay, bu carb, no cup odr	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406) Pawnee @ 4430' (-1406) Little Osage @ 4465' (-1441) Little Osage @ 4487' (-1463) CFS 4514' (30'/60'') Excello @ 4512' (-1488) CFS 4514' (30'/60'') Excello @ 4543' (-1519) DST #2 "Johnson" 463-4602 5292013 30 45690 14 Open = 14'' BM, bit to BOB in 85' (15' BB) 20' Open = 14'' BM, bit to BOB in 85' (15' FB) 20' Open = 14'' BM, bit to BOB in 15' CHE OSAGE (-1554) DST #2 "Johnson" 463-4602 5292013 30 45690 15' CHE DI HILL BOB IN 15' CHE DI HILL BOB IN
Base of KC Marmaton Marmaton Altamont Pawnee Pawnee Pawnee Pawnee Pawnee Pawnee Pawnee Pawnee Pawnee Pawnee Data Pawnee P				LS-crm, micro vfn, mostly uniform, sm foss as above, nvp, no cup odr, ns. SS-dirty gry, vin gm, well srtd, sub round, calc matrix, striated redgray, no cup odr, ns. SS-brick red, vin gm as above, arg cament, semi friable, no cup odr, ns. LS: grylltan, fn xln, mostly dense, sm brittle, fw chily, fw flakey/meaby, throny, fw pos pur chik, fw SH: grybrn, silty, no cup odr, ns. LS: gryllan, fn xln, mostly dense, fw brittle, why chily, sm sandygrifty, throny, sm SH: grybrn, silty, no cup odr, ns. LS: gryllan, fn xln, mostly dense, fw brittle, sm chily, fw flakey/meaby, throny, sm SH: grybrn, silty, no cup odr, ns. LS: gryllan, fn xln, mostly dense, fw brittle, sm chily, fw flakey/meaby, throny, sm SH: grybrn, silty, no cup odr, ns. LS: gryllan, fn xln, mostly dense, fw brittle, sm chily, fw flakey/meaby, throny, fw pos pur chik, sm SH: gry, silty, med cush, no cup odr, ns. LS: laryltan, fn xln, mostly dense, sm brittle, sm chily, fw flakey/meaby, throny, fw pos yur chik, sm SH: gry, silty, med cush, no cup odr, ns. LS: laryltan, fn xln, mostly dense, sm brittle, fw chiky, fw flakey/meaby, throny, fw pos yur chik, sm SH: grygrift), sm SH: grygrift), with, fw any, no cup odr, ns. LS: laryltan, fn xln, mostly dense, sm brittle, sm chiky, fw flakey/meaby, throny, fw pos pur chik, fw SH: gry, silty, no cup odr, ns. LS: laryltan, fn xln, mostly dense, sm brittle, fw chiky, fw flakey/meaby, throny, fw pos pur chik, fw SH: grydrift, gry, sm SH: grydrift, with, mostly dense, sm brittle, sm chiky, fw flakey/meaby, throny, fw pos pur chik, fw SH: grydrift, gry, sm SH: silt, and fn xln, mostly dense, sm brittle, fw chiky, tr-nyp, sm Chert: whitopaque, sharp, hw SH: grydrift, gry, sm fissile, no cup odr, ns. LS: lanvitt an, fn xln, mostly dense, sm brittle, fw chiky, tr-nyp, sm Chert: whitopaque, sharp, hw SH: grydrift, gry, sm fissile, no cup odr, ns. LS: lanvitt an, fn xln, mostly dense, sm brittle, fw chiky, tr-nyp, wr Chert: grysmokey, sharp, hw SH: grydrift, gry, sm fissile, no cup odr, ns. LS: lanvitt gry, fn xln, fw ost fr	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406) Upper Ft. Scott @ 4465' (-1441) Little Osage @ 4465' (-1441) CFS 4514' (30''/60'') Excello @ 4512' (-1488) CFS 4514' (30''/60'') Excello @ 4512' (-1488) DST #2 ''Johnson'' 4963-4902 S28/21'' 30.450' 496 to Open = 14" BM, bit to BOB in 85' (15'' BB) Photo Photo Photo Photo 100 Open = 148'' BM, bit to BOB in 85' (15''' BB) Photo Photo Photo 100 Open = 148'' BM, bit to BOB in 85' (15''''''''''''''''''''''''''''''''''
Pase of KC Marmaton Marmaton Paymee Paymee Paymee Fi Soott Fi Soott Excello SH Vertigris Cherokee SH Vertigris DST #2 DST #2				LS-crm, micro xin, mostly uniform, sm foss as above, mp, no cup odr, ns. SS-dirty gry, vin gm, well srtd, sub round, calc matrix, striated regigras, no cup odr, ns. SS-brick red, vin gm as above, arg cament, semi friable, no cup odr, ns. LS: grylitan, fn xin, mostly dense, sm brittle, fw chiky, fw fiakey/medy, throp, tw pcs pur chik, fw SH: grybrn, silty, no cup odr, ns. LS: grylitan, fn xin, mostly dense, fw brittle, fw chiky, fw fiakey/medy, france, the providence of the transport of the transport and y gritty, tr-mp, sm SH: grybrn, silty, no cup odr, ns. LS: grylitan, fn xin, mostly dense, fw brittle, fw chiky, fw fiakey/medy, tr-mp, sm SH: grybrn, silty, no cup odr, ns. LS: grylitan, fn xin, mostly dense, fw brittle, sm sandy/gritty, tr-mp, sml SH: grybrn, silty, sm gritty/sandy like, no cup odr, ns. LS: tar/lt gry, fn xin, mostly dense, fw brittle, sm chiky, fw fiakey/medy, tr-mp, tw pcs w/ fr km in stns, no fuor/cut, sm SH: grygrm, silty, med crush, no cup odr, ns. LS: it grylitan, fn xin, sm dense, sm brittle, fw chiky, fw fiakey/medy, tr-mp, tw pcs fw fr km in stns, no fuor/cut, sm SH: grygrm/blu, silty, fw waxy, no cup odr, ns. LS: tar/lt tan, fn xin, sm dense, sm brittle, fw chiky, fw fiakey/medy, tr-mp, tw pcs pur chik, fw SH: gry, silty, no cup odr, ns. LS: tar/lt tan, fn xin, mostly dense, sm brittle, fw chiky, fw fiakey/medy, tr-mp, tw pcs pur chik, fw SH: grydrik gry, silty, no cup odr, ns. LS: tar/lt tan, fn xin, mostly dense, sm brittle, fw chiky, tr-mp, sm Chert: whitopaque, sharp, tw SH: grydrik gry, sm SH: grydrik gry, silty, med crush, no cup odr, ns. LS: tar/lt tan, fn xin, mostly dense, sm brittle, fw chiky, tr-mp, sm Chert: whitopaque, sharp, tw SH: grybribik, silty, sor cup, no cup odr, ns. LS: tar/lt gry, fn xin, mostly dense, sm brittle, fw chiky, tr-mp, sm Chert: whitopaque, sharp, tw SH: grybribik, silty, sor cup, no cup odr, ns. LS: tar/lt gry, fn xin, mostly dense, sm chitle, sm chiky, fw fiakey/medy the title, tr-mp, sm Chert: whitogry, sharp, fw SH: grybribik, sitty, w carb, no	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilites on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406) Pawnee @ 4430' (-1406) Little Osage @ 4465' (-1441) Little Osage @ 4487' (-1463) CFS 4514' (30''/60'') Excello @ 4512' (-1488) CFS 4514' (30''/60'') Excello @ 4512' (-1488) DST #2 "Johnson" 4653-4602 S202013 20 4569 CFS 4514' (30''/60'') Excello @ 4512' (-1488) DST #2 "Johnson" 4653-4602 S202013 20 4569 B (1995 Total Fluck CFS 00 4572' (-1463) DST #2 "Johnson" 4653-4602 S202013 20 4569 B (1995 Total Fluck B (1995 Total Fluck S00 (1995 Total
Base of KC Marmaton Marmaton Altamont Pawnee Pawnee Pawnee Fi Sott Excello SH Vertigris Excello SH Vertigris Cherokee SH OST #2 OST #2 OST #2				LS-orm, micro xin, mostly uniform, sm foss as above, nvp, no cop dr, ns. SS-drity gry, Vin grn, well srid, sub round, cale matrix, striated regray, no cup odr, ns. SS-brick red, vin grn as above, arg cement, semi friable, no cup odr, ns. LS: gryltan, fn xin, mostly dense, sm brittle, fw chilky, fw flakeyimeaky. Ir.mo, fw pos pur chik, w SH: grylbrn, silly, no cup odr, ns. LS: gryltan, fn xin, mostly dense, hw brittle, fw chilky, fw flakeyimeaky. Ir.mo, fw pos pur chik, w SH: grylbrn, silly, no cup odr, ns. LS: gryltan, fn xin, mostly dense, hw brittle, fw chilky, fw flakeyimeaky. Ir.mop, two ps pur obik, sm SH: grylbrn, silly, no cup odr, ns. LS: gryltan, fn xin, mostly dense, hw brittle, sm chilky, fw flakeyimeaky. Ir.mop, two ps pur chik, sm SH: gryl sm od crysh, no cup odr, ns. LS: lanilt gry, fn xin, mostly dense, sm brittle, fw chilky, fw flakeyimeaky. Ir.mop, two ps pur chik, sm SH: gry, silly, med crysh, no cup odr, ns. LS: gryltan, fn xin, mostly dense, sm brittle, fw chilky, fw flakeyimeaky. Ir.mop, two ps our dik, sm SH: gry, silly, no cup odr, ns. LS: gryltan, fn xin, mostly dense, sm brittle, fw flakeyimeaky. Ir.mop, two ps our dik, min stans, no flourciat, sm SH: grygmbiu, sills, fw way, no cup odr, ns. LS: lanilt gry, fw moti, in xin, sm dense, sm brittle, fw flakeyimeaky. Ir.mop, fw pos pur chik, fw SH: gryl, silly, no cup odr, ns. LS: tanilt tan, fn xin, mostly dense, sm brittle, fw chilky, fw flakeyimeaky. Ir.mop, fw pos pur chik, fw SH: grylink, silly, no cup odr, ns. LS: tanilt tan, fn xin, mostly dense, sm brittle, fw chilky, fr-mop, sm flassile, no cup odr, ns. LS: tanilt tan, fn xin, mostly dense, sm brittle, fw chilky, fr-mop, sort Chert: whitograpue, sharp, fw SH: grylink, silly, sm carb, on cup odr, ns. LS: tanilt tan, fn xin, mostly dense, sm brittle, fw chilky, fr-mop, mo cup odr, ns. LS: tanilt tan, fn xin, mostly dense, sm brittle, fw chilky, fr-mop, sm Chert: whitograpue, sharp, fw SH: grylinky, smith- tan, fn xin, fn xin, mostly dense, sm c	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406) Upper Ft. Scott @ 4465' (-1441) Little Osage @ 4465' (-1441) CFS 4514' (30''/60'') Excello @ 4512' (-1488) CFS 4514' (30''/60'') Excello @ 4512' (-1488) D5T #2 "Johnson" 488-4602 522013 30-45699 151 Open 14" Bbw, bit to BOB in 0" (PF 4514' (30''/60'') Excello @ 4512' (-1488) D5T #2 "Johnson" 488-4602 522013 30-45699 151 Open 14" Bbw, bit to BOB in 0" (PF 4514'' (-1463) D5T #2 "Johnson" 488-4602 522013 30-45699 151 Open 14" Bbw, bit to BOB in 0" (PF 121'' IF Bbw, bit to BOB in 0" (PF 121''' Bbw, bit to BOB in 0" (PF 121'''' Bbw, bit to BOB in 0" (PF 121'''''''''''''''''''''''''''''''''''
Passe of KC Marmaton Marmaton Altamont Pawnee Pawnee Pawnee Fi Soott Fi Soott Fi Soott Verigns Verigns Norrow Norrow				LS-orm, micro xin, mostly uniform, sm foss as above, nup, no cap odr. ns. SS-brick red, vin grn as above, arg cement, semi friable, no cap odr, ns. LS: gryltan, in xin, mostly dense, sm brittle, fw chiky, fw flakeymealy, turny, fw pos pur chik, wi SH: grybrn, sily, no cap odr, ns. LS: gryltan, in xin, mostly dense, tw brittle, fw chiky, fw flakeymealy, turny, is pos pur chik, wi SH: grybrn, sily, no cap odr, ns. LS: gryltan, in xin, mostly dense, fw brittle, fw chiky, sm sandyigritty, turny, sm SH: grybrn, sily, no cap odr, ns. LS: gryltan, in xin, mostly dense, fw brittle, fw chiky, sm sandyigritty, turny, sm SH: grybrn, silty, no cap odr, ns. LS: gryltan, in xin, mostly dense, fw brittle, sm chiky, fw flakeymealy, throny, fw pos pur chik, sm SH: gry, silty, med rush, no cap odr, ns. LS: gryltan, in xin, mostly dense, sm brittle, sm chiky, fw flakeymealy, throny, fw pos pur chik, sm SH: gry, silty, med rush, no cap odr, ns. LS: gryltan, in xin, mostly dense, sm brittle, fw chiky, tw flakeymealy, throny, fw pos pur chik, sm sht, gry, silty, med rush, no cap odr, ns. LS: gryltan, in xin, mostly dense, sm brittle, fw sandyigritby, tw way, no cup odr, ns. LS: tanift gry, tw mott, mai, m, end ense, sm brittle, fw sandyigritby, tw chiky, throny, fw SH: grylbrn, silty, no cup odr, ns. LS: tanift an, in xin, mostly dense, sm brittle, fw chiky, tr- my, sm Chert: whitogaue, sharp, iw SH: grylchik, gry, silty, no cup odr, ns. LS: tanift an, in xin, mostly dense, sm hard, sm flakeymealy, throny, sauch Chert: whitogaue, sharp, iw SH: grylchik gry sm fissile, no cup odr, ns. LS: tanift an, in xin, mostly dense, sm hard, sm flakeymealy, throny, sinch Chert: whitogaue, sharp, iw SH: grylchik, silty, sort cap odr, ns. LS: tanift an, in xin, mostly dense, sm brittle, fw chiky, tr-mp, m Chert: whitogaue, sharp, hw SH: grylchik, silty, sort cap odr, ns. LS: tanift an, in xin, mostly dense, sm ohritte, sm chiky, fw flakeymealy, throny, tw Chert: grylmy, sharp, fw SH: grylchik, silty, sort cap odr, ns. LS: ta	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406) Upper Ft. Scott @ 4465' (-1441) Little Osage @ 4465' (-1441) CFS 4514' (30''/60'') Excello @ 4512' (-1488) CFS 4514' (30''/60'') Excello @ 4512' (-1488) CFS 4514' (30''/60'') Excello @ 4512' (-1488) DST #2 "Johnson" 4563-4602 522273 30-46-00 18 Coper 14" Blw, bit to BOB in 95'' (12" Softword Of 785 (10) CFS 151 Ft Tot Fhud, 30'' CO 185' (12" Softword Of 785 190'' (11) COB IN 10'' CFS 4514'' (30''/60'') Excello @ 4512' (-1488) DST #2 "Johnson" 4563-4602 (32'') COB IN 10'' PFD-101/20# FDF-1008 11 Coper 14" Blw, bit to BOB IN 10'' CFS 4514'' (30''/60'') Excello @ 4518' (-1519) DST #2 "Johnson @ 4588' (-1564) Johnson @ 4588' (-1564) Mud-Co Check 530(13'' 4662 We Y S 15 9 HO ST 101 PH HU LOM As 3,000 1# Mud-Co Check 530(13' 4662 We Y S 15 9 HO ST 101 PH HU LOM As 3,000 1# Mud-Co Check 530(13' 4662 We Y S 15 9 HO ST 101 PH HU LOM As 3,000 1# Mud-Co Check 530(13' 4662 We Y S 15 9 HO ST 101 PH HU LOM As 3,000 1#
Passe of KC Marmaton Altamont Pavnee Upper Ft Scott Excello SH Verigns Krebs DST #2 OR (min/ti) Norrow				LS-orm, micro xh, mostly uniform, sm foss as above, my, no cop dr, ns. SS-drity gry, Vh grn, well std, sub round, cale matrix, striated redgrag, no cup odr, ns. SS-brick red, Vh grn as above, arg cement, semi friable, no cup odr, ns. LS: gryttan, fn xhn, mostly dense, sm brittle, fw chiky, fw flakeyimeaky, tw pos wur zu por, fw SH: bm/gry, sily, no cup odr, ns. LS: gryttan, fn xhn, mostly dense, tw brittle, fw chiky, fw flakeyimeaky, tw pos wur zu por, fw SH: bm/gry, sily, no cup odr, ns. LS: gryttan, fn xhn, mostly dense, tw brittle, fw chiky, fw flakeyimeaky, tw nos wur zu gor, fw SH: bm/gry, sily, no cup odr, ns. LS: gryttan, fn xhn, mostly dense, tw brittle, sm chiky, fw flakeyimeaky, thrup, by pos pur chik, sm SH: grytyn, sily, med crush, no cup odr, ns. LS: gryttan, fn xhn, mostly dense, sm chiky, fw flakeyimeaky through sub-flakeyimeaky, through the sen chiky, fw flakeyimeaky, thrup, hy pos yur chik, sm SH: grytyn, silw, med crush, no cup odr, ns. LS: gryttan, fn xhn, mostly dense, sm chilky, fw flakeyimeaky flakeyimeaky, thrup, hy pos yur chik, sm SH: grytyn, silw, no cup odr, ns. LS: gryttan, fn xhn, mostly dense, sm brittle, fw chiky, fw flakeyimeaky, thrup, hy pos yur chik, tw SH: grytyn, silw, no cup odr, ns. LS: lantlata, fn xhn, mostly dense, sm brittle, fw chiky, fw flakeyimeaky, thrup, hy pos yur chik, tw SH: grytyn, silw, no cup odr, ns. LS: lantlata, fn xhn, mostly dense, sm brittle, fw chiky, fr-my, and/gritty, fw xhn, mostly dense, sm brittle, fw chiky, fr-my, serd SH: grytynk way, no cup odr, ns. LS: lantlata, fn xhn, mostly dense, sm brittle, fw chiky, fr-my, serd SH: grytynk y sharp, fw SH: grytynky, sharp, SH: grytynk, sharp, fw XH: grytynky, sharp, shift, fw chiky, fr-my, hy cos wur chik, w SH: grytynky, sharp, shift, fw chiky, fr-my, hy cos wur chik, w chiky, fr-my, no cup odr, ns. LS: lantlata, fn xhn, mostly dense, sm brittle, fw chiky, fr-my, fw chert: grytynk, sharp, fw SH: grytynnbik, sily, sor chiky, fw chik, no cup odr, ns. LS: lantlata, fn	B/KC @ 4331' (-1307) John Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406) Upper Ft. Scott @ 4465' (-1441) Little Osage @ 4487' (-1463) CFS 4514' (30''60'') Excello @ 4512' (-1488) CFS 4514' (30''60'') Excello @ 4512' (-1488) CFS 4514' (30''60'') Excello @ 4512' (-1488) D57 22'' 10 head in 10'' B7 25'' 10 head in 10'' B7 25'' 100'' 100'' CFS 4514' (30''60'') Excello @ 4512' (-1488) D57 22'' 10 head in 10'' B7 25'' 100'' 100 0PB = WSB bit to BOB in 37'' (15''') 20'' 0PB = WSB bit to B
Paymee ROP (minth) Altamont Paymee Paymee Fi Sout Excello SH Verligris Verligris Cherokee SH Verligris DIST R2 DIST R2				LS-orm, micro xin, mostly uniform, sm foss as above, nup, no cap dr, ns. SS-drity gry, vin grn, well srid, sub round, calc matrix, striated redgrag, no cup odr, ns. SS-bridk red, vin grn as above, arg cement, semi friable, no cup odr, ns. LS: gryltan, fix xin, mostly dense, sm brittle, fiv chilky, fiv flakeymealy, in poss wir pr usp por, fiv SH: bringry, silty, no cup odr, ns. LS: gryltan, fix xin, mostly dense, wir brittle, fiv chilky, sm sandygritty, tr-mp, sm SH: grybrn, silty, no cup odr, ns. LS: gryltan, fix xin, mostly dense, fiv brittle, sm chilky, fiv flakeymealy, in poss, in y usp por, fiv SH: bringry, silty, no cup odr, ns. LS: gryltan, fix xin, mostly dense, fiv brittle, sm chilky, fiv flakeymealy, in-mp, sm SH: grybrn, silty, no cup odr, ns. LS: gryltan, fix xin, mostly dense, fiv brittle, sm chilky, fir flakeymealy, in-mp, fix poss of run, sm SH: gry, silty, med runs, no cup odr, ns. LS: gryltan, fix xin, mostly dense, sm brittle, fiv chilky, wir flakeymealy, in-mp, fix poss of runs insts, no flucord, an SH: grygrin, silty, med crush, no cup odr, ns. LS: gryltan, fix xin, mostly dense, sm brittle, fiv sandygritty, fix whilky, tr-mp, fix grybrn, silty, no cup odr, ns. LS: tanilt gry, fix mostly, dense, sm brittle, fix chilky, fir- flakeymealy, in-mp, fix poss of runs, fix grybris, silty, no cup odr, ns. LS: tanilt, fix, fix, mostly dense, sm brittle, fix chilky, fix- smd/syritty, fix chilky, tr-mp, fix SH: grybrintle, fix sindygritty, fix, hin, mostly dense, sm brittle, fix chilky, fix- smd/syritty, wirk, fix, mostly dense, sm brittle, fix- grybrintle, silty, fix and, mostly dense, sm brittle, fix- smd/syritty, fix dinky, grys, shap, fix SH: grybrintle, fix- flakeymealy, tr-mp, fix postly, dense, sm chilty, fix- silt, grybrint, hin, mostly dense, sm brittle, fix- smd/syritty, fix, hin, mostly dense, sm brittle, fix- grybrintle, silty, fix xin, mostly dense, sm brittle, fix- grybrintle, silty, fix xin, mostly dense, sm orittle, fix, silty, fix- flas, and the fix	B/KC @ 4331' (-1307) dohn Goldsmith took over Geologic Responsibilities on location from from Steve Carl who was filling in. Marmaton @ 4362' (-1338) Altamont @ 4413' (-1389) Pawnee @ 4430' (-1406) Upper Ft. Scott @ 4465' (-1441) Little Osage @ 4487' (-1463) CFS 4514 (30''60'') Excello @ 4512' (-1488) CFS 4514 (30''60'') Excello @ 4512' (-1488) CFS 4514 (30''60'') Excello @ 4512' (-1488) Bit 2''damson'' 483-4602 5282013 30-46694 150 (pt = '18") bit to BOB in 10° 160 (pt = '18") bi

)	chlky, tr-nvp, v fw SH: gry/drk gry/brn, silty, no cup odr, ns.	
PTD 4715' -1601	LS: crm/lt tan/lt gry, fn xln, mostly dense, sm sandy/gritty, fw chlky/brittle, tr-nvp, fw SH: gry/brn, silty, fw waxy, no cup odr, ns.	CFS @ 4715' (30''/60'')
LTD 4710', -1686		Survey @ 4715' = 3/4 Degree

#### **ALLIED OIL & GAS SERVICES, LLC** 060204 Federal Tax I.D. # 20-8651475

EMIT TO P.O. BOX 93999 SERVICE POINT: SOUTHLAKE, TEXAS 76092 -Darley SEC. TWP. JOB START RANGE CALLED OUT ON LOCATION JOB FINISH DATES-2-13 27 10 33 430 STATE COUNTY WELL LEASE LANOVA LOCATION DAKley KS, 9.12 miles south 86 Logan OLD OR (EW)(Circle one) west into CONTRACTOR Deke. 4 OWNER Same TYPE OF JOB Suchace HOLE SIZE 14 14 T.D. Jao CEMENT CASING SIZE 8% DEPTH 440 AMOUNT ORDERED 1650 3% cc 2% get **TUBING SIZE** DEPTH DRILL PIPE DEPTH TOOL DEPTH PRES. MAX COMMON\_165 @\_17<sup>12</sup> 2953 20 MINIMUM MEAS. LINE SHOE JOINT POZMIX ര 93 HS CEMENT LEFT IN CSG. 15 70 20 GEL 3 0 64 80 PERFS. CHLORIDE ŵ 6 DISPLACEMENT 13.05 ASC, ര ര EOUIPMENT ര ø PUMP TRUCK CEMENTER Dave Ritcloff 0 # 386/481 HELPER Paul Beaver @ BULK TRUCK @ DRIVER Chris Helpingstich # 347 @ BULK TRUCK @ DRIVER Ħ HANDLING 178, 4/6 ft 442 47 MILEAGE 24= Mmile 8.143 ton 201.13 **REMARKS:** SERVICE Pump conent Release plug DEPTH OF JOB 230 Wash up / Displace 151225 PUMP TRUCK CHARGE Coment did circulate EXTRA FOOTAGE @ 9.5 73.15 @ 7.70 MILBAGE 215 22 @ MANIFOLD Head 20 @ 4 22-41, Lite Vehical Ø CHARGE TO: Grand Mesz Operating Inc TOTAL 1902.20 STREET \_\_\_\_ CITY\_\_\_\_\_STATE \_\_\_\_ \_ZIP\_\_\_ PLUG & FLOAT EQUIPMENT To: Allied Oil & Gas Services, LLC. You are hereby requested to rent cementing equipment and furnish cementer and helper(s) to assist owner or contractor to do work as is listed. The above work was done to satisfaction and supervision of owner agent or contractor. I have read and understand the "GENERAL SALES TAX (If Any). TERMS AND CONDITIONS" listed on the reverse side. 6060.74 TOTAL CHARGES. PRINTED NAME Tich Wheeler \_\_\_\_ IF PAID IN 30 DAYS ,272.79 DISCOUNT 4,788.14 Net. SIGNATURE Rich Wheele

8% wooden alw	@	1076H	16764
1-3	@		
	@		
	@		
	@		<u></u> ,

TOTAL 10764:

384 00

TOTAL 4051.10

JOB LOG				SWIFT Services, Inc.			DATE 5-31-13 PAGE NO.		
CUSTOMER Grand Mess		esq.	WELL NO. 2	27	LEASE	r) 106	JOB TYPE 5/2 Love Str. MA	TICKET NO. 24427	
CHART	TIME	RATE	YOLUME	PUMPS	PRESSUR	E (PSI)	DESCRIPTION OF OPERATION A	ID MATERIALS	
NO	0570	(DPM)			TUBING	CASING			
							On IVER FUN	· · · · · · · · · · · · · · · · · · ·	
					1		TO 4715 ST	i <b>Z</b>	
	1						TP 4712 Fue	4700	
							PL No #57 2551'	54 + 15 5#	
							Centralities 2, 4, 6, 8,1	0, 12, 14 51	
							Baskers 3, 52	· · · · · · · · · · · · · · · · · · ·	
	0730						Start Lising	· · · · · · · · · · · · · · · · · · ·	
	0930						Drop Ball Break Curcu	letion Rotake	
	(010		7/5				Plue BH 30 etc. MH	24.57	
	1015	5	12	v		300	Start Mud flush		
		5	. 20			300	Start KEL Flush		
		5	75			2:0	Stack ( Que To	ste Se a 10 74	
							CHEAP Y		
		5	24			w	Start EAZ 100 SKS		
	1038						Prip Plug		
							With out pump + lines	····	
	1040	6.5				200	Stert Accolorman	· · · · · · · · · · · · · · · · · · ·	
	$li\omega$		111.8	1		750	land Plup		
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							Release Dry		
							wish up Acck up		
								······································	
	1145						JUB Lun plate	······	
							than K You		
							Just Brian, John		

SWIFT Services, Inc. TICKET NO. 24380 JOB LOG CUSTOMER Grand Mesa JOB TYPE WELL NO. LEASE cement port collar 27 <u>Aenova</u> PRESSURE (PSI) PUMPS CHART NO. RATE (BPM) VOLUME (BBL) (GAL) TIME DESCRIPTION OF OPERATION AND MATERIALS C TUBING CASING T 3005ks SmD w/ 9 # Flocele 5シャス ま Dant collar 2550 YRK114 1000 on loc 1255 1000 1000 tast to 1000 psi - held open om J2bom @ 1235 32 ini 250 Z ESTIPS. 32 17.40 Mix SMD cemut @ 11.2009 250 ふち lend to surface 4 300 Comin + 1308 32 to su 400 1 20 face RUA. - sach  $+ \upsilon$ 30 1310 32 14 400 isplace is. Portiollar - held 1320 1000 1000 Run 5 journes Reverse 1338 logs 2 -2 conut wash tereks 1350 L nl [4.2C ۶ SAAC

Acidizing	l Report	<b>1</b> . <b>1</b> .	0-00			our	JELU		Date 6	126	113
Customer (	Grand Mi	25a	Pro-Stim Che	mical Yard	ahto	n	Pro-Stim	Number	A#4	7	• <del>* • • • • • • • • • • • • • • • • • •</del>
Well Name & N	Number Jooda	<b>1</b> -27	Field			<b>_</b>	Formation	1	S	pot	
County Low	State	KS	BHT	****	YD		Interval	458	9-93	459	7-460-
Well Type:	Completion	Recompletion	O Worko	ver 🗅 🛛 Öli 🗆	Gas⊡	Water 🗆	Dispos	al 🗆	Perf 🗆	она	
Job Pumped V	ia: Tubino <b>M</b>	Casing T	Annulus 🗂	CTUn	Combination 🗆	Plugit	epth		Packer (	Septh (	
Casing Size:		IGRD IV	NT Dec	vi v	Tubing Size:	- 71-	GF	20	Iwr	Spot ,	090
Casing Vol.	512	Tba Vol	Ann	ı Vol	OH Vol	2118	Tol	al Displa	cemient 🚗	5	
Maximum Pres	stirA	Tubing	Cas	uina	Proposed P	Imp Time	AC	)L.	Leave Lo	<u>/15</u>	<u></u>
Special Instruc	tions:				59	alst	+0-30	ηı	lagl	AI	-150
·	1250	Gal 15	-> HC-	·1 -	25	B	<u>o -ba</u>	13	-3		
	20	Cal R	enal		<u>- 30</u>	> Bé	115	2%	KU	<u> </u>	
	5	Gal 1	9R-630	· · · · · · · · · · · · · · · · · · ·	40	) Ga	ls S	-30	50		
	5	Gal S.	262	Treatment I	Record Pres	sure	<u>.</u> 1				
Time	Type Fluid	Rate BMP	Vol Bbls	Vol Bble	Tubing	Casing			Observati	ons	
							Safety Me	seting		***	
1	Acid		an ann an Air				Prs lest t	0			351
<u> 10</u>	Had	5.0		10:0		<u>0</u>		<b>.</b>	0	110	
12	Acid	<u><u> </u></u>		10.		$-\frac{O}{\Delta}$	$+\frac{SI}{0}$		<u>, k</u>	LIC	
13	A	5.0		22.3		- <u>0</u> -	<u> </u>	2113	<u>(00)</u>	<u> </u>	
14	Acio	610	16 - 1907 - 1999 - 1999 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1	213		<u>0</u>	<u> </u>	Je II	10ad	ed	******
$\frac{13}{17}$	Acid	0		244	300	$\mathcal{O}$	_				1977-1977-1-11-18-01-0
16	And			000	150	$\frac{O}{\Lambda}$			ntanan feranan dari kana dari kana dari ma	***	*******
$\frac{1}{20}$	Acid	1922		2001	1000	$\overline{}$		retar almine ar das candiarentas	-		
	Acid	1.00		29	700	$\overline{\Delta}$		<u> </u>	· .		
22	Acid	$\gamma \circ \gamma$		30	800	6		1.1	(m.	P	
23	Flush	20		30	700	$\overline{\mathcal{O}}$		<u>-Cier</u>		<u></u>	
24	Flich	2.5		34	750	Ō		<b>.</b>	<u></u>		<u></u>
25	Flush	2,5		36	700	0		<b></b>			
26	Flush	3.0		40	800	0					
22	Flush	3,0		45	700	$\wedge$		•			
28	Flush	3,0		49	600	Ŏ					
29	Flush	3,0		54	600	0					
30	Aush	3,0		57,5	600	0					
				Treatment Sy	nopsis				r	<del></del> 1	
Avg Inj Rate	Fluid BPM 215			Total Injec	ted H20 S	17.5	Acid 30	<u>)</u>	Oil		
Treating Prs	Max 1000	Final 66	O Avg.	700	ISIP J	$\overline{\mathcal{O}}$	5°SI 13	50	10'SI 91	in lac	15'SI
Customer Rep	resentativo	John	A fel	<i>c</i>	]	Pro-Stirr	Supervisor				

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Acidizing	Report	-		duance A:	-		Des Cher Mumber	1 6/a	8/3
Customer G	rand M	lesa	Pro-Stim Cher	nical Yard Di	ghten			A6	
Nell Name & Nu	Tanova	2-27	Field		J		Formation	Spot	1 barrel
County Log	State	KS	BHT		YD		Interval 4//	9-23	
Vell Type:	Completion F	Recompletion	D Workov	er 🗆 🛛 Öil 🗆	Gas 🗆	Water 🗆	Disposal D	Perf O	40
ob Pumped Via	a: Tubing ti	Casing 🗆	Annulus 🗆	CTVo	Combination 🗆	Plug De	oth	Packer Depth	080
Casing Size:	5%	GRD	NT Dep	ĥ	Tubing Size:	27/8	GRD	WT Spo	4120
Casing Vol.	107	Tbg Vol 2	3.6 Ann	Vol	OH Vol	<u> </u>	Total Displac	ement	
Aaximum Press	ure	Tubing	Casi	ng	Proposed Pu	mp Time	AOL	Leave Loc	
Special Instruction	ons:	ـــــــــــــــــــــــــــــــــــــ		20 2	100	A	0		
	¢	150 gal	S RU	JR-2 Binni	15 10	ach	<u>X</u>		
	C	<u>x30015</u>	ACL	oloci	al 2	70			
				Treatment	Record				<u> </u>
Time	Type Fluid	Rate BMP	Increment	Cum Vol Bhis	Pres	sure Caeina		Observations	
			Voi obis		Tuburg .	, Oldering	Safety Meeting		
							Prs Test to		psi
/	Acid	5	Fort	/			Sat	Acid	
/2	Acid	3.2	/	200	40				
13	Acid	3.2		6	40		Acil	gone	
20	Flush	0		23.5	80		loader	<u>1</u>	
22	Fluch	.2	ŕ	23.8	650		-	·····	
23	Flush	,5		24.2	580				
24	Flush	,75		24.8	440				
24	Flush	1.0		25.2	380	<u> </u>			
<b>2</b> - 24	Flush	2.0		27.1	470				
29	Flash	2.0		31	360		Total	100d	
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	<u> </u>								
	1	1	1	<u> </u>	<u>                                      </u>		1		
				Treatment S	ynopsis				
Avg Inj Rate	Fluid BPM			Treatment S Total Inje	cted H20 7	5	Acid La	Oil	JAC.

# Diamond Testing

# **General information Report**

# **General Information**

Company Name GRAND MESA OPERATING COMPANY

Contact	RICHARD J. REILLY		
Well Name	JANOVA #2-27	Job Number	T213
Unique Well ID	DST #1, LKC "E-F", 4106-4143	Representative	TIM VENTERS
Surface Location	SEC 27-12S-32, LOGAN CO. KS.	Well Operator	GRAND MESA OPERATING COMPANY
Well License Number		Report Date	2013/05/27
Field	WILDCAT	Prepared By	TIM VENTERS
Well Type	Vertical		

Test Type	CONVENTIONAL		
Formation	DST #1, LKC "E-F", 4106-4143		
Well Fluid Type	01 Oil	Start Test Time	05:34:00
		Final Test Time	13:17:00
Start Test Date	2013/05/27		
Final Test Date	2013/05/27		
Gauge Name	8457		

Gauge Name Gauge Serial Number

#### **Test Results**

RECOVERED: 30' MUD

TOOL SAMPLE: TRACE OIL, 100% MUD



C:\Documents and Settings\Roger\My Documents\JANOVA2-27DST1.FKT 27-May-13 Ver

**JANOVA #2-27** Formation: DST #1, LKC "E-F", 4106-4143 Pool: WILDCAT

#### **GRAND MESA OPERATING COMPANY** DST #1, LKC "E-F", 4106-4143 Start Test Date: 2013/05/27 Final Test Date: 2013/05/27

	DIAMONE
	P.O. B
	HOISINGTON,
	(800) 54
	DRILL-STEM
	FILE: JANO
CDAND MEGA ODEDAT	

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#### DIAMOND TESTING P.O. Box 157 HOISINGTON, KANSAS 67544 (800) 542-7313 DRILL-STEM TEST TICKET FILE: JANOVA2-27DST1

TIME ON: 05:34

TIME OFF: 13:17

Company_GRAND MESA OPERATING COMPANY	Lease & Well No. JANOVA #2-27	
Contractor DUKE DRILLING CO., INC. RIG #4	_ Charge to GRAND MESA OPEF	ATING COMPANY
Elevation 3024 KB Formation LKC "E-F	_Effective Pay	Ft. Ticket No T213
Date <u>5-27-13</u> Sec. <u>27</u> Twp. <u>12</u> S Ra	inge32 W County	LOGAN State KANSAS
Test Approved By STEVE CARL	Diamond Representative	TIM VENTERS
Formation Test No1 Interval Tested from41	06_ft. to4143_ft. Tot	al Depth4143 ft.
Packer Depth 4101 ft. Size6 3/4 in.	Packer depth	ft. Size6 3/4in.
Packer Depth 4106 ft. Size6 3/4 in.	Packer depth	ft. Size <u>6 3/4</u> in.
Depth of Selective Zone Set		
Top Recorder Depth (Inside) 4087 ft.	Recorder Number 845	7 Cap. 10,000 P.S.I.
Bottom Recorder Depth (Outside) 4140 ft.	Recorder Number1103	0_Cap5,025_P.S.I.
Below Straddle Recorder Depthft.	Recorder Number	_CapP.S.I.
Mud Type CHEMICAL Viscosity 61	Drill Collar Length	<u>-</u> ft. I.D. <u> </u>
Weight9.2         Water Loss6.4         cc.	Weight Pipe Length	ft. I.D2 7/8 in
Chlorides 2,800 P.P.M.	Drill Pipe Length 407	3_ft. I.D3 1/2in
Jars: Make STERLING Serial Number 4	Test Tool Length3	3_ft. Tool Size3_1/2-IF in
Did Well Flow? NO Reversed Out NO	Anchor Length 3	7_ft. Size 4 1/2-FH in
Main Hole Size 7 7/8 Tool Joint Size 4 1/2 XH in.	Surface Choke Size 1	_in. Bottom Choke Size_5/8_in
Blow: 1st Open: WEAK 1/4 INCH BLOW, BUILDI	NG TO 1 1/4 INCH.	(NO B.B.)
2nd Open: VERY WEAK SURFACE BLOW, B	UILDING TO 1/4 INCH	. (NO B.B.)
Recovered 30 ft. of MUD		
Recoveredft. of		Price Job
Recoveredft. of		
		Other Charges
Remarks:		Other Charges Insurance
Remarks:		Other Charges Insurance
Tool Sample: TRACE OIL, 100% MUD	11:29 AM <sup>A.M.</sup>	Other Charges Insurance Total
Remarks:	ttom11:38 AMP.MMa	Other Charges Insurance Total ximum Temperature 118 deg.
Remarks:	ttom11:38 AMP.MMa (A)1954_P.S.I.	Other Charges Insurance Total ximum Temperature 118 deg.
Remarks:	ttom11:38 AMP.MMa (A)1954 P.S.I. (B)6 P.S.I. t	Other Charges Insurance Total ximum Temperature 118 deg. o (C) 12 P.S.I.
Remarks:	ttom11:38 AMP.MMa (A)1954 P.S.I. (B)6P.S.I. t (D)1231 P.S.I.	Other Charges Insurance Total ximum Temperature 118 deg. p (C) 12 P.S.I.
Remarks:	ttom11:38 AMP.MMa (A)1954 P.S.I. (B)6 P.S.I. t (D)1231 P.S.I. (E)13 P.S.I. to	Other Charges           Insurance           Total           ximum Temperature         118 deg.           p (C)         12 p.s.l.           p (F)         21 p.s.l.
Remarks:	ttom 11:38 AM P.M. Ma (A) 1954 P.S.I. (B) 6 P.S.I. t (D) 1231 P.S.I. (E) 13 P.S.I. to (G) 1241 P.S.I.	Other Charges           Insurance           Total           ximum Temperature         118 deg.           o (C)         12 P.S.I.           o (F)         21 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.

# Diamond Testing

# **General information Report**

## **General Information**

Company Name GRAND MESA OPERATING COMPANY

Contact Well Name Unique Well ID Surface Location Well License Number Field Well Type	RICHARD J. REILLY JANOVA #2-27 DST #2, JOHNSON, 4563-4602 SEC 27-12S-32W, LOGAN CO. KS. WILDCAT Vertical	Job Number Representative Well Operator Report Date Prepared By	T214 TIM VENTERS GRAND MESA OPERATING COMPANY 2013/05/27 TIM VENTERS
Test Type Formation Well Fluid Type	CONVENTIONAL DST #2, JOHNSON, 4563-4602 01 Oil	Start Test Time Final Test Time	13:12:00 22:13:00

Start	Test	Date
Final	Test	Date

8457

2013/05/27 2013/05/27

Gauge Name Gauge Serial Number

#### **Test Results**

RECOVERED: 1315' GAS IN PIPE 300' GO, 2% GAS, 98% OIL, GRAVITY: 29 60' G,VSOCM, 10% GAS, 4% OIL, 86% MUD 125' G,SW&MCO, 3% GAS, 78% OIL, 8% WATER, 11% MUD 60' VG,HW&MCO, 24% GAS, 39% OIL, 19% WATER, 18% MUD 545' TOTAL FLUID

TOOL SAMPLE: 10% GAS, 49% OIL, 18% WATER, 23% MUD

CHLORIDES: 34,000 ppm PH: 7.5 RW: .38 @ 64 deg.



GRAND MESA OPERATING COMPANY DST #2, JOHNSON, 4563-4602 Start Test Date: 2013/05/27 Final Test Date: 2013/05/27 JANOVA #2-27 Formation: DST #2, JOHNSON, 4563-4602 Pool: WILDCAT



#### DIAMOND TESTING P.O. Box 157 HOISINGTON, KANSAS 67544 (800) 542-7313 DRILL-STEM TEST TICKET FILE: JANOVA2-27DST2

TIME ON: 13:12

TIME OFF: 22:13

Company GRAND MESA OPERATING COMPANY	Lease & Well No. JANOVA #2-27					
Contractor DUKE DRILLING CO., INC. RIG #4	Charge to GRAND MESA OPERATING COMPANY					
Elevation3024 KB FormationJOHNSO	V_Effective PayFt. Ticket NoT214					
Date <u>5-29-13</u> Sec. <u>27</u> Twp. <u>12</u> S Ra	ange32 W CountyLOGANState_KANSAS					
Test Approved By JOHN GOLDSMITH	_ Diamond Representative TIM VENTERS					
Formation Test No. 2 Interval Tested from 45	63 ft. to 4602 ft. Total Depth 4602 ft.					
Packer Depth 4558 ft. Size6 3/4 in.	Packer depthft. Size6 3/4 in.					
Packer Depth 4563 ft. Size6 3/4 in.	Packer depthft. Size6 3/4 in.					
Depth of Selective Zone Set						
Top Recorder Depth (Inside) 4544 ft.	Recorder Number 8457 Cap. 10,000 P.S.I.					
Bottom Recorder Depth (Outside) 4599 ft.	Recorder Number 11030 Cap. 5,025 P.S.I.					
Below Straddle Recorder Depthft.	Recorder NumberCapP.S.I.					
Mud Type CHEMICAL Viscosity 54	Drill Collar Length ft. I.D 2 1/4 in					
Weight 9.5 Water Loss 8.8 cc.	Weight Pipe Lengthft. I.D2 7/8 i					
ChloridesP.P.M.	Drill Pipe Length 4530 ft. I.D 3 1/2 ii					
Jars: MakeSTERLINGSerial Number4	Test Tool Length 33 ft. Tool Size3 1/2-IF ir					
Did Well Flow?NOReversed OutNO	Anchor Length 39 ft. Size 4 1/2-FH i					
Main Hole Size 7 7/8 Tool Joint Size 4 1/2 XH in.	Surface Choke Size1 in. Bottom Choke Size_5/8 in					
Blow: 1st Open: WEAK 1/4 INCH BLOW, BUILDIN	G, REACHING BOB 8 1/2 MIN. (1 1/2 " B.B.)					
<sup>2nd Open:</sup> WEAK SURFACE BLOW, BUILDI	NG, REACHING BOB 10 MIN. (NO B.B.)					
Recovered 1315 ft, of GAS IN PIPE						
Recovered 300 ft. of GO, 2% GAS, 98% OIL, GRAVITY:	29					
Becovered 60 ft. of G,VSOCM, 10% GAS, 4% OIL, 86% MUD						
Recovered 125 ft. of G,SW&MCO, 3% GAS, 78% OIL	., 8% WATER, 11% MUD					
Recovered 60 ft. of VG,HW&MCO, 24% GAS, 39% OIL	, 19% WATER, 18% MUD Price Job					
Recovered 545 ft. of TOTAL FLUID CHLOF	RIDES: 34,000 ppm Other Charges					
Remarks:PH: 7.5	5 Insurance					
RW: .38	8 @ 64 deg.					
Tool Sample: 10% GAS, 49% OIL, 18% WATER, 23% MU	D Total					
Time Set Packer(s) 3:40 PM P.M. Time Started Off Bo	ttom 7:25 PM P.M. Maximum Temperature 130 deg.					
Initial Hydrostatic Pressure	(A)P.S.I.					
Initial Flow Period Minutes 30	(B)12 P.S.I. to (C)111 P.S.I.					
Initial Closed In Period Minutes 45	(D) <u>1100</u> P.S.I.					
Final Flow Period	(E) 104 P.S.I. to (F) 229 P.S.I.					
Final Closed In Period	(G) 1099 P.S.I.					
Final Hydrostatic Pressure	(H) 2226 <sub>P.S.I.</sub>					

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.

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

August 13, 2013

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

Re: ACO1 API 15-109-21183-00-00 JANOVA 2-27 NE/4 Sec.27-12S-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