# KOLAR Document ID: 1463304

Confiden	tiality Requested:
Yes	No

KANSAS CORPORATION COMMISSION OIL & GAS CONSERVATION DIVISION Form ACO-1 January 2018 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.:
Name:		Spot Description:
Address 1:		
Address 2:		Feet from  North /  South Line of Section
City: State: Zip:	+	Feet from East / West Line of Section
Contact Person:		Footages Calculated from Nearest Outside Section Corner:
Phone: ()		
CONTRACTOR: License #		GPS Location: Lat:, Long:
Name:		(e.g. xx.xxxx) (e.gxxx.xxxx)
Wellsite Geologist:		Datum: NAD27 NAD83 WGS84
Purchaser:		County:
Designate Type of Completion:		Lease Name: Well #:
New Well Re-Entry	Workover	Field Name:
	_	Producing Formation:
		Elevation: Ground: Kelly Bushing:
		Total Vertical Depth: Plug Back Total Depth:
CM (Coal Bed Methane)		Amount of Surface Pipe Set and Cemented at: Feet
Cathodic Other (Core, Expl., etc.):		Multiple Stage Cementing Collar Used? Yes No
If Workover/Re-entry: Old Well Info as follows:		If yes, show depth set: Feet
Operator:		If Alternate II completion, cement circulated from:
Well Name:		feet depth to:w/sx cmt.
Original Comp. Date: Original Tota	al Depth:	
Deepening Re-perf. Conv. to EOF	R Conv. to SWD	Drilling Fluid Management Plan
Plug Back Liner Conv. to GS	N Conv. to Producer	(Data must be collected from the Reserve Pit)
		Chloride content: ppm Fluid volume: bbls
		Dewatering method used:
		Location of fluid disposal if hauled offsite:
GSW Permit #:		Operator Name:
		Lease Name: License #:
Spud Date or Date Reached TD	Completion Date or	Quarter Sec TwpS. R East West
•	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 Drill Stem Tests Received
Geologist Report / Mud Logs Received
UIC Distribution
ALT I II III Approved by: Date:

# KOLAR Document ID: 1463304

Operator Nam	ne:			Lease Name:	Well #:
Sec	Twp	S. R	East West	County:	

Page Two

**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 Take			<u> </u>	/es 🗌 No	1		L	og Forn	nation (Top), De	pth and	d Datum	Sample
(Attach Additiona				(		N	lame	<del>)</del>			Тор	Datum
Samples Sent to Ge Cores Taken Electric Log Run Geologist Report / M List All E. Logs Run:	Aud Logs	vey		∕es ∟ Νο ∕es □ Νο ∕es □ Νο ∕es □ Νο	1							
			Rep	CASI ort all strings	NG RECO		Nev		duction, etc.			
Purpose of String		ze Hole Drilled	Si	ze Casing et (In O.D.)		Weight _bs. / Ft.		Setting Depth	Type o Cemei		# Sacks Used	Type and Percent Additives
Purpose:		Depth	Turo	ADDITIO e of Cement		NTING / S		EEZE RECC		and Pa	ercent Additives	
Perforate	Тор	Bottom	тур	e of Cement	#0				туре	anu re	Acent Additives	
Protect Casing Plug Back TD Plug Off Zone												
<ol> <li>Did you perform a h</li> <li>Does the volume of</li> <li>Was the hydraulic fractional first Production</li> </ol>	the total base acturing treat	e fluid of the hy ment informat	ydraulic fi ion subm	acturing treat	emical disclo		stry?	Gas Lift	No (If	No, skip No, fill c	o questions 2 an o question 3) out Page Three o	
Estimated Production Per 24 Hours	1	Oil B	bls.	Gas	Mcf	,	Wate	r	Bbls.	Ga	as-Oil Ratio	Gravity
DISPOSIT	TION OF GAS	8:			METHO		1PLE	TION:			PRODUCTIC Top	N INTERVAL: Bottom
Vented So	old Use	ed on Lease		Open Hole	Perf.		-	Comp ACO-5)	Commingled (Submit ACO-4)		100	
Shots Per Foot	Perforation Top	Perforat Bottor		Bridge Plug Type		e Plug t At		,	Acid, Fracture, Sho (Amount ar		enting Squeeze of Material Used)	Record
TUBING RECORD:	Size:		Set At:		Packer	At:						

Form	ACO1 - Well Completion
Operator	Bird Dog Oil, LLC
Well Name	M&N-GATES 1-16
Doc ID	1463304

All Electric Logs Run

DI	
CDNL	
Micro	
Sonic	

Form	ACO1 - Well Completion
Operator	Bird Dog Oil, LLC
Well Name	M&N-GATES 1-16
Doc ID	1463304

# Casing

Purpose Of String	Size Hole Drilled	Size Casing Set	Weight	Setting Depth	Type Of Cement		Type and Percent Additives
Surface	12.25	8.625	23	306	80/20Poz		2%Gel&3 %CC
Production	7.875	5.5	15.5	3896	QPRO-C	185	

# JUSTIN D. CARTER CONSULTING GEOLOGIST

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

Well Name: Well Id:	M&N GATES 1-16
Location:	NW, NW, NW Sec. 16 - 22S - 13W Stafford Co., KS
License Number:	15-185-24046-0000 Region: Kenilworth West
Spud Date:	
Surface Coordinates:	
Bottom Hole Coordinates:	306': 1/2 DEG, 3446': 3/4 DEG, 3900': 3/4 DEG
Ground Elevation (ft):	1898' K.B. Elevation (ft): 1906'
Logged Interval (ft): Formation:	
Type of Drilling Fluid:	Chemical Mud

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

#### OPERATOR

Company: BIRD DOG OIL, LLC Address: 1801 Broadway, Suite #200 Denver, CO 80202-3840 Co. Geo.: Mr. Scott Stewart

#### GEOLOGIST

Name: Justin D. Carter Company: Consulting Geologist Address: 1640 N. Roosevelt Ave. Liberal, KS 67901 Phone: 620-655-1187

Comments

Drilling Contractor: Discovery Drilling Rig #2 Tool Pusher: Terry Wickham

8 5/8" surface casing set at 306'

Mud: MudCo Engineer: Jason Whiting

Gas Detector: Blue Stem

DSTs: Eagle Testers Tester: Gene Budig

**Open-Hole Loggers: Pioneer Wireline** 

	DRIL	L STEM TE	ST REP	ORT			
	Bird Dog	OF LLC		16	-225-134	v Stafford	
Annand (	1601 Bros 80202	adway Suile 200 De	nver "Colorado			s#1-16 1073 t	JST#:2
Game Sund W	ATTN: J	ustin Carter				019.01.22 @ 14:2	- (G
GENERAL INFORMA	TION						
	0	ft (KB)		Tes		Conventional Bett Gene Budig 1	om Hole (Initial)
Interval: 3470.00 ft Total Depth: 3500.1 Hole Diameter: 7.3				Ref		evations: 19 19 to GR/CF:	09.00 ft (KB) 01.00 ft (CF) 8.00 ft
Start Time: TEST COMMENT 1si 1si	Shut-In 30 Minutes	Time: ak blow for 12 minu		Time On Time Off	Bim: Bim:	2019.01.22 @ 16: 2019.01.22 @ 17:	06:00
	f Opening 30 Minutes wies 5 Shut-In - 30 Minutes Presence vs. Time	K DIOW TOP TO MINUE	es decreased l				
(178)	MARTE TO	nanye.	Time	Pressure	Temp	Annotation	
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	Recovery				Ga	s Rates	_
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00.00	oil out mud less than	0.24					
30.00 very slight) 0.00 1 % or 99%	mid	0.00					

麗(		DRILLS	TEM TES	I KEPU					
墨		Bird Deg OI LLC	C		16-23	2s-13w \$	Stafford		
三月7	(lesters)	1991 Broodway	y Suite 200 Denve	er .Colorado	M&N	-Gates	#1-16		
	0.00	80202	,	1.11.00000	Job T	icket: 010	72	DST#:1	
S.		ATTN: Justin (	Garter		Test :	Start: 201	9.01.22 @ 00	:49:00	
GENER	AL INFORMATION								
		it (Ki	B)		Test Teste Unit M	ar: G	ene Budig	ottom Hole (Init	iai)
Interval	: 3429.00 ft (KB) To 3 oth: 3446.00 ft (KB) (T	VD)			Refe			1909.00 ft (K 1901.00 ft (C 8.00 ft	
	meter: 7.88 inchesHol	e Condition: Fair				KB to	anon	0.00 10	
	te: 2019.01.22			2019.01.22 19:16:00	Capacity: Last Calib Time On E Time Off I	).: 31m: 2		5000.00 peig 19.01.22 14:28:00 17:29:30	I
	COMMENT 1st Opening 1 1st Shut-h 3 2nd Opening 45 2nd Shut-h 9	30 Minutes 5 Minutes weak bu			o the water			21	
	1st Shut-In 3 2nd Opening 45 2nd Shut-In 9 Pressure vs	00 Minutes 5 Minutes w eak bu 0 Micinutes - Wine	ilding blow built t	o 12 inches int	e the water PF		E SUMMA		
	1st Shut-In 3 2nd Opening 45 2nd Shut-In 9	90 Minutes 5 Minutes wieak bu 9 Meinutes	uilding blow built is	0 12 inches int Time (Mn.) 0 1 16	o the water	Temp (deg F) 05.76 05.02 08.04 09.70 09.80 104.67 109.31		static w(1) 1) w(2) 2)	
	1st Snut-In 2nd Opening 45 2nd Shut-In Pressure vs with the state of t	00 Minutes 5 Minutes weak bu 0 Michaels 3 Time: 9 Minutes 9 Minute	ulding blow built is	0 12 inches int Time (Min.) 0 1 16 45 46 90 161	Pressure (psig) 1702.95 42.11 80.90 032.04 76.72 129.84 837.21	Temp (deg F) 05.76 05.02 08.04 09.70 09.80 104.67 109.31	Annotation Initial Hydro- Open To Flow Shut-In(1) End Shut-In( Open To Flow Shut-In(2) End Shut-In(2)	static w(1) 1) w(2) 2)	
1755 1733 1733 1735 1735 1735 1735 1735	1st Snut-In 2nd Opening 45 2nd Shut-In Presente vs unterference Additional and and a statement and a statement	30 Minutes 5 Minutes weak bu 0 Melnutes "Ymme" 	ulding blow built is	0 12 inches int Time (Min.) 0 1 16 45 46 90 161	Pressure (psig) 1702.95 42.11 80.90 032.04 76.72 129.84 837.21	Temp (dog F) 95.76 95.62 98.04 99.70 99.80 104.67 109.31 109.47	Annotation Initial Hydro- Open To Flow Shut-In(1) End Shut-In( Open To Flow Shut-In(2) End Shut-In(2)	static w(1) 1) w(2) 2)	
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1760 1710 17100 17100 1710 17100 1710 1700 1700 1700 1700 1700 1700 1700 1700 1700 1700 1700 1700 1700 1700 1700 1700 1700 1700 170	1st Shut-h 3 2nd Opening 45 2nd Shut-h 9 Presente vs 000000000000000000000000000000000000	30 Minutes 5 Minutes weak bu 0 Michaels 3 Time: 19 Time:	ulding blow built is	0 12 inches int Time (Min.) 0 1 16 45 46 90 161	Pressure (psig) 1702.95 42.11 80.90 032.04 76.72 129.84 837.21	Temp (deg F) 95.76 95.62 96.04 99.60 104.97 109.31 109.47	Annotation Initial Hydro- Open To Flot Shut-In(1) End Shut-In( Open To Flot Shut-In(2) End Shut-In( Final Hydro-	static w (1) 1) w (2) 2) static	ano (i de l
575 513 523 523 730 730 730 730 730 750 750 750 750 750 750 750 750 750 75	1st Snut-In 2nd Opening 45 2nd Shut-In 9 Presente vs 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	30 Minutes 5 Minutes weak bu 0 Michaels 3 Time: 9 Parts Times 9 Parts 9 Parts	Holing blow built is	0 12 inches int Time (Min.) 0 1 16 45 46 90 161	Pressure (psig) 1702.95 42.11 80.90 032.04 76.72 129.84 837.21	Temp (deg F) 95.76 95.62 96.04 99.60 104.97 109.31 109.47	Annotation Initial Hydro- Open To Flot Shut-In(1) End Shut-In( Open To Flot Shut-In(2) End Shut-In( Final Hydro-	static w (1) 1) w (2) 2) static	ano (3.60)
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4 -		DRILLS	TEM TES	T REPO					
	S. 2 SHO	Bird Dog OI LLC				-13w Sta	afford		
	chere		/ Suite 200 Denve	r .Colorado	M&N-0	Gates #1	-16		
A State of State		1801 Breadway 80202	y outre see were		Job Tici	ket: 01074	ł.	DST#:3	
Gonte		ATTN: Justin C	Carter		Test St	art: 2019.0	01.23 @	04:49:00	
GENERAL INF Formation: Deviated: Time Tool Opene Time Tool Opene Time Tool Ended: Interval:	Kansas City "H" No Whipsteck: 6:00:00:00 203:09:00 3532.00 ft (KB) To 3 3552.00 ft (KB) (1	IVD)	(סי		Tester Unit No	: Gen	tions:	ai Boltom Hole 7 1909.00 1901.00 8.00	n (KB) ft (CF)
Total Depth: Hole Diameter:	7.86 inchesHo	le Condition: Fair				KB to C	artor	0.00	
Serial #: 911 Press@RunDep Start Date:	th: 796.02 psig 2019.01.23	End Date	30	2019.01.23 15:03:00	Capacity: Last Calib.: Time On Bi	m: 20	19.01.2	5000.00 2019.01.23 3 @ 06:44:30 3 @ 09:50:30	
Start Time:	04:48:00	15 Minutes Strong	biow gas to surf	ace in 8 minute		UT 20	10.01.2		
	IENT 1st Opening 1st Shut-In	15 Mnutes Strong 30 Mnutes good b 45 Mnutes strong 90 Mnutres good b	biow gas to surf dow back bioow see gas f		PR	ESSURE	E SUM	IMARY	
	IENT 1st Opening 1st Shut-In 2 nd opening 2nd Shut-In	15 Mnutes Strong 30 Mnutes good b 45 Mnutes strong 90 Mnutres good b	i blow gas to surf slow back bloow see gas fi blow back	ew report Time (Mn.) 0 1 15 47 40 90 106 196	PR Pressure (psig) 1770.71 196.88 220.29 798.27 266.93 460.90 796.02	ESSURE (deg F) 90.52 90.52 91.17 93.00 92.89 95.08 95.08	E SUM Annot Dital Hy Open T Shut-In End Sh Open T Shut-In Shut-In End Sh	IMARY ation ydro-static o Flow (1) (1) ut-tn(1) ro Flow (2)	
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TEST COMM	IENT 1st Opening 1st Snut-In 2nd Snut-In Pressure v	15 Minutes Strong 30 Minutes good b 45 Minutes strong 90 Minutres good b s. Time with the strong s. Time s. Time with the strong s. Time s. Ti	blow gas to surf slow back blow see gas fi blow back	ew report Time (Mn.) 0 1 15 47 40 90 108 188	PR Pressure (psig) 1770.71 196.88 220.29 798.27 266.93 460.90 796.02	ESSURE Temp (deg F) 90.52 90.52 91.17 93.00 92.80 95.06 96.84 99.19 Ga	SUM Annot Open T Shut-In End Sh Open T Shut-In End Sh Final H	IMARY ation vdro-static o Flow (1) (1) ut-In(1) fo Flow (2) (2) vdro-static	Gas Ret (M

tΓ	a for	DRILL STEM 1	ES	TREP	ORT			
書く		Bird Dog OI LLC			16	-225-13	w Stafford	
		1901 Broadway Suite 200 60202	Denv	er ,Colorado			s#1-16	
Star	Hand Kan	ATTN: Justin Carter					01075	
		WITH, JUSTIC CALLER	_		Te	st Start: 2	019.01.24 @	04:38:00
	I. INFORMATION							
Deviated: Time Tool O	Arbuckle No Whipstock: pened: 06:19:00 hded: 21:49:00	п (КВ)			Te		Conventiona Gene Budig 1	i Bottom Hole (Initial)
Interval: Total Depth: Hole Diamet	3760.00 ft (KB) To 38 3923.00 ft (KB) (Τι len: 7.80 inchesHole	23.00 ft (KB) (TVD) (D) Condition: Fair,			Re		levations: to GR/OF:	1909.00 ft (KB) 1901.00 ft (CF) 8.00 ft
Press@Run Start Date: Start Time:	16:19:00 MMENT 1st Opening 15 1st Shut-In 30	End Date: End Time: Mnutes w eak 1 inch blow Mnutes Mnutes no blow for 10 mnu		2019.01.24 21:31.29 eak blow for	Time On Time Off	ib.: Bim: Bim:	2019.01.24 g 2019.01.24 g	
-	Pressure vs. Ti	101964	-		P	RESSU	RE SUMM	ARY
	The first state of the state of	PE THE SE	de se de ce de ce de la se	Time (Min.) 0 1 15 45 45 45 71 107 109	Prossure (poig) 1922.17 73.98 74.70 983.54 91.54 92.97 470.49 1024.70	Temp (deg F) 90.77 100.52 103.00 104.33 104.35 105.46 107.40	Annotation	n -slatic sw(1) (1) sw(2) (2)
	Recovery					Ga	s Rates	
Langth (t)	Description	Volume (183)					ništes) Freedule	(pug) Ger Bare (Motia)
10.00	oil cut mud 30% Oil 70% M							a and a second sec
0.00	Olean oil between the too	s 0.00						

ipha	DRILL STEM T	EST REP	ORT		
	Bird Dog Oil LLC		16-229-13	w Stafford	
	1801 Broadway Suite 200	Denver ,Colorado	M&N-Gat	es#1-16	
Com Brond Com	60202		Job Ticket:	01076	DST#:5
Chrone count a conver	ATTN: Justin Carter		Test Start:	2019.01.25 @ 0	24:19:00
GENERAL INFORMATION					
Formation: Arbuckle Deviated: No Whipstock: Time Tool Opened: 05:50:00 Time Test Ended: 11:19:00	It (KB)			Gene Budig	Bottom Hole (Initial)
Interval: 3823.00 ft (KB) To 3 Total Depth: 3929.00 ft (KB) (1 Hole Diameter: 7.00 inchesHo	TVD)				1909.00 ft (KB) 1901.00 ft (CF) 8.00 ft
Start Date: 2019.01.25 Start Time: 04:19:00 TEST COMMENT 1st Opening 1 1st Shut-In 3		11:12:30 bollom of a 5 gallo	Time Off Btm: n bucket in 12 minut	2019.01.25 @ 2019.01.25 @ les	
2nd Shut-In S	00 Minutes 1/2 inch blow back	1	PRESSL	JRE SUMMA	RY
1020 1020		= 2 3 16	150.97 106.2 208.08 114.6 1328.37 112.0	7) 19 Initial Hydro- 19 Open To Fiot	slatic v (1) 1) v (2) 2)
Recovery			G	ias Pates	
Langth (1) Description	Volume (107)		Child	ə (indhərj) 🛛 Pressure	(ping) Gei Reis (Mollig
420.00 Clean Gassy Oil 290%		+			
20,00 muddy gassy of 20% g		-			*-

## Remarks

After careful review of the sample log, electric logs, and DST reports, the decision was made to run 5 1/2" casing to do further testing of the L/KC and Arbuckle zones in the M&N Gates #1-16.

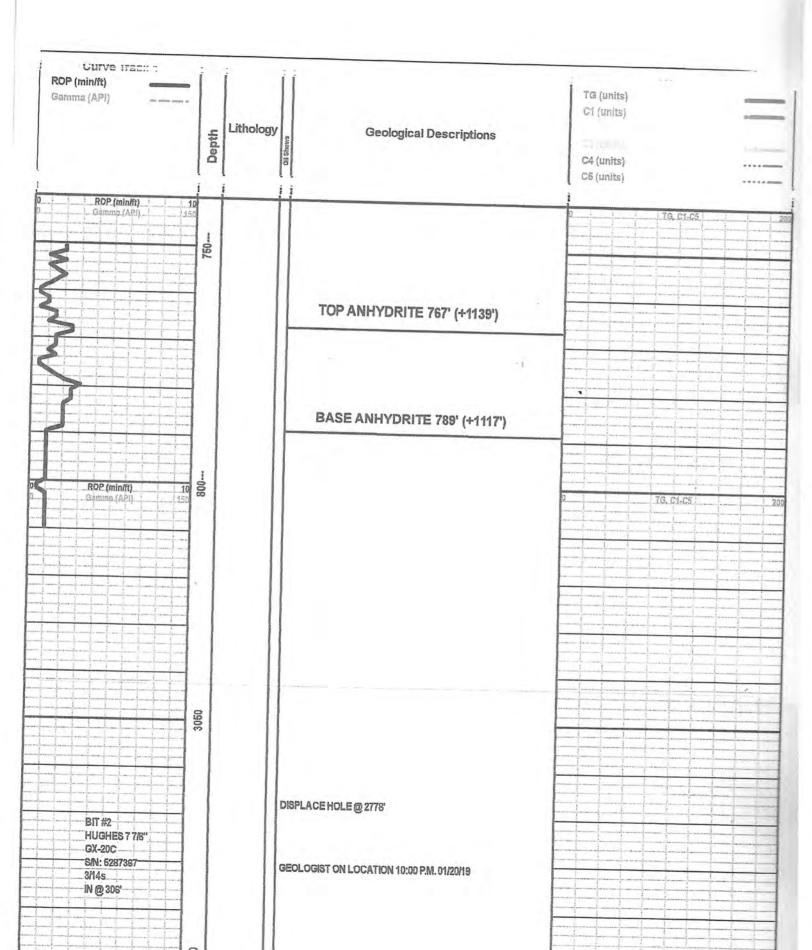
Respectfully submitted,

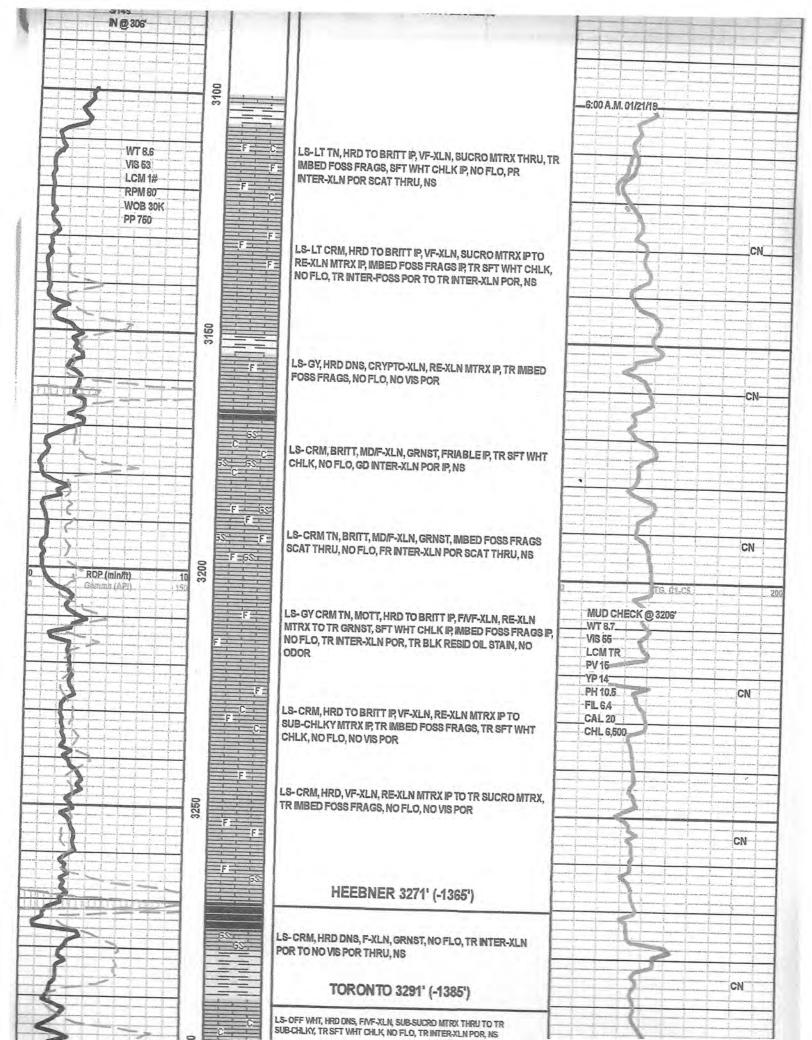
D. Carto

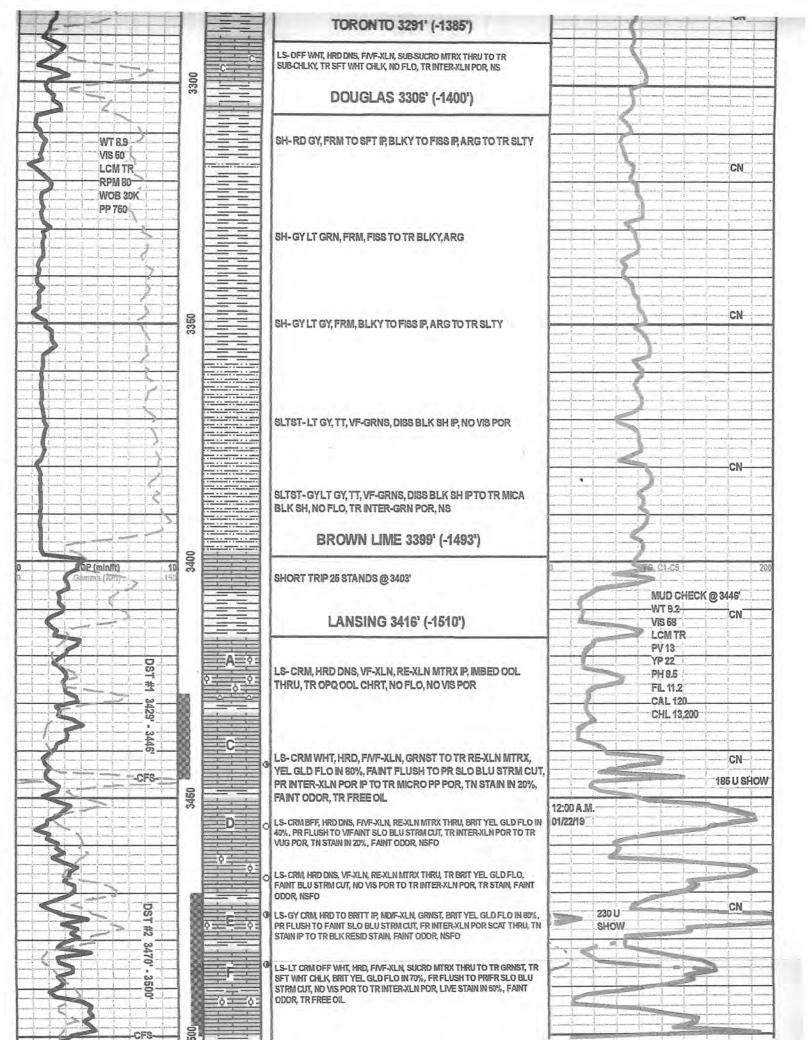
Justin D. Carter Consulting Geologist

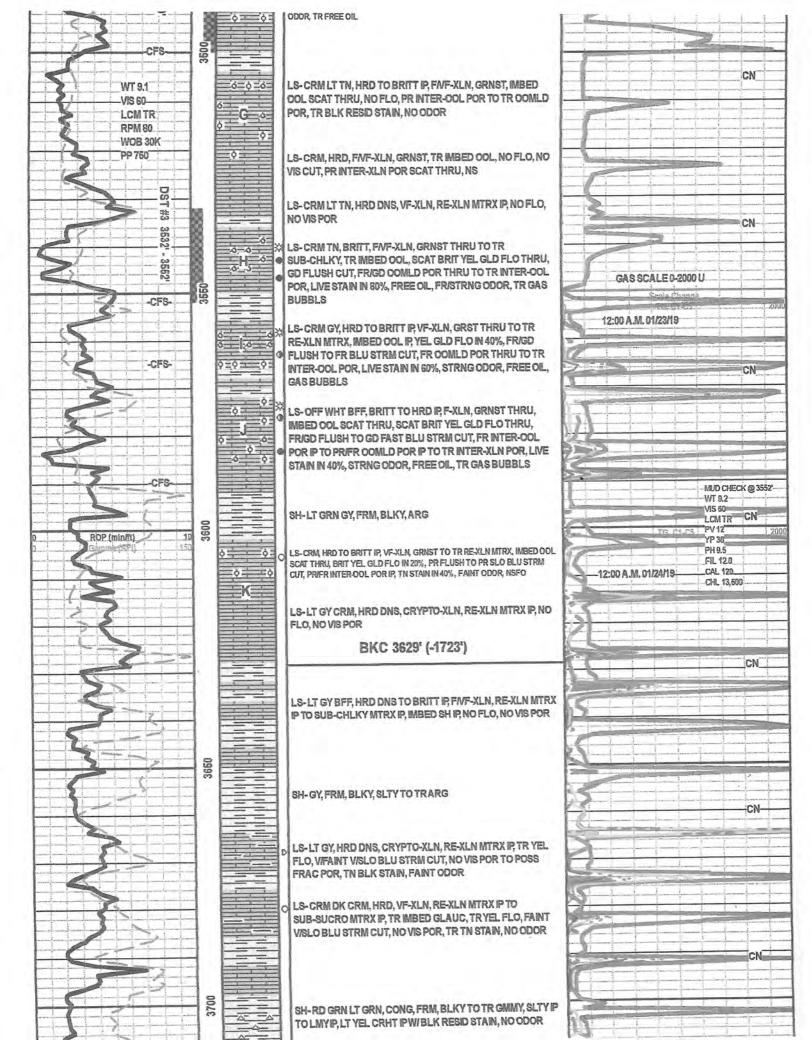
oonouning ocorogior			
Anhy Bent Brec AAAA Cht Ciyst Coal Congi Dol	Gyp igne Lmst Meta TTTT Mrist Sait Shale Shcol	ROCK TYPES Shgy Sltst Ss Till Carb sh Dol Dtd Gry sh	Sandyims Shale Sitstn Shiysits Sitysh Lms
FOSSIL         Algae         Amph         Belm         Bioclst         Brach         Bryozoa         Cephal         Coral         Coral         Coral         Coral         Crin         Echin         Fish         Foram         Fossil         Gastro         Oolite         Oolite         Ostra         Pelec         Pisolite         Plant         Strom         Fuss         Oomold	MINERAL Anhy Arggrn Arg B Bent Bit B Brecfrag Calc Calc Carb Carb Carb Chtdk Chttk Dol Feldspar Ferrpel Ferrpel Ferr Glau Gyp Hvymin Kaol Minxl Minxl Nodule Phos P Pyr	ACCESSORIES  Salt Sandy Silt Silt Sil Silt Silt Silt Chlorite Dol Chlorite Dol Slty STRINGER Anhy Arg Bent Coal Dol Gyp Ls Mrst Sitstrg Ssstrg Carbsh Clystn	<ul> <li>Dol</li> <li>Grysh</li> <li>Grysh</li> <li>Grysh</li> <li>Grysh</li> <li>Grysh</li> <li>Sandylms</li> <li>Sh</li> <li>Sh</li> <li>Sh</li> <li>Shstn</li> </ul> <b>TEXTURE</b> <ul> <li>Boundst</li> <li>Sh</li> <li>Shstn</li> </ul> <b>TEXTURE</b> <ul> <li>Boundst</li> <li>Crysin</li> <li>Boundst</li> <li>Crysin</li> <li>Crysin</li> <li>Earthy</li> <li>Sistn</li> </ul> <b>TEXTURE</b> <ul> <li>Boundst</li> <li>Sh</li> <li>Shstn</li> </ul> <b>TEXTURE</b> <ul> <li>Boundst</li> <li>Crysin</li> <li>Crysin</li> <li>Earthy</li> <li>Crysin</li> <li>Earthy</li> <li>Earthy</li> <li>Microsin</li> <li>Microsin</li> <li>Mudst</li> <li>Packst</li> <li>Wackest</li> </ul>
INTERVALS Core Dst	Dst	THER SYMBOLS OIL SHOWS Even Spotted	☑Ques☑Dead☑Gas show

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5			VIOLA 3716' (-1810')			
-CFS-	444444444444444444444444444444444444444		CHRT- CRM WHT, HRD DNS, ANG, BRIT YELGLD FLO IN 30%, FAINT FLUSH TO PR SLO BLU STRM CUT, NO VIS POR TO POSS FRAC POR, BLK/DK TN STAIN IP, FAINT ODOR, NSFO		MUD CHECK @ WT 9.0 VIS 60 LCM TR	3720' CN
	444		CHRT-WHT, HRD DNS, ANG, TN DOLO W/STAIN IP, YEL GLD FLO IN 80%, PR FLUSH TO PR SLO BLU STRM CUT, TR INTER-XLN POR IN DOLO TO NO VIS POR THRU, TN STAIN IN 30%, STRNG ODOR, NSFO			
3	3750		3754" DOLO-TN, HRD, F-XLN, SUCRO MTRX THRU, WHT CHRT WI STAIN IP, DLL YEL FLO THRU, FAINT FLUSH TO PR SLO BLU STRM CUT, PR INTER-XLN POR THRU, TN STAIN THRU, STRNG ODOR, FREE OIL	2		CN
2			SIMPSON 3763' (-1857')			
P S S			SH-DK RD GRN, FRM, BLKY, ARG, WXY TEXT, RD CHRT IP, TR OOMLDIC DOLO			
#4 3760-3822		0 	SS-TN, TT, F-GRNS, FR SRT, SUB-ANG TO SUB-RND GRNS, SILI CMNT, TR IMBED CHLK, VIDLL YEL FLO THRU, FR FLUSH TO FR BLU STRM CUT, PR/FR INTER-GRN POR THRU, TN STAIN THRU, STRNG ODOR, FREE OIL			CN
0	3800		SH-BLUISH GRN, FRM TO SFT IP, LMY, IMBED CLR SS GRNS			2000
			ARBUCKLE 3814' (-1908')			
-CFSCFS	3	5	DOLO-WHT, BRITT TO HRD DNS, VF-XLN, SUCRO MTRX THRU, OOL IMBED IP, YEL GLD FLO THRU, GD FLUSH TO GD FAST BLU STRM CUT, FR OOMLD POR SCAT THRU TO TR INTER-OOL POR, LIVE STAIN IN 70%, STRNG ODOR, FREE OIL		12:00 A.M. 01/2	CN
CFS-	8	•	3825' DOLO-WHT PINK, HRD TO BRITT IP, MDIF-XLN, SUCRO MTRX THRU, YEL GLD FLO THRU, FR FLUSH TO FR BLU STRM CUT, FR INTER-XLN POR THRU, BLK STAIN IN 40%, STRNG ODDR, TR FREE OIL		MUD CHECK ( WT 9.2 VIS 51	@ 3828
~		0	3831' DOLO-WHT, HRD TO ERITT IP, MDIF-XLN, SUCRO MTRX THRU, YEL GLD FLO IN 20%, FR FLUSH TO FR BLU STRM CUT, PRIFR INTER-XLN POR THRU, BLK STAIN SCAT THRU, FRISTRING ODOR, TR FREE OIL		PV 10 PV 28 PH 10.0	
	3850		3840' DOLO-WHT LT CRM, HRD, MDIVF-XLN, SUCRO MTRX THRU, YEL GLD FLO IN 80%, FR FLUSH TO FR BLU STRM CUT, PRIFR INTER-XLN POR THRU, BLK STAIN IN 30%, STRNG ODDR, HVY FREE OIL IP		FIL 14A CAL 100 CHL 15,800	
Š	2	2	3855' DOLO-OFF WHT LT CRM, HRD, MD/F-XLN, SUCRO MTRX THRU, DLL YEL GLD FLO THRU, FAINT FLUSH TO PR SLO BLU STRM CUT, PR INTER-XLN POR THRU, TR BLK STAIN, TR FREE OIL FR/STRNG ODOR			
2			3870' DOLO-OFF WHT, HRD DNS, F/VF-XLN, SUCRO MTRX THRU TO TR RE-XLN MTRX, TR WHT CHRT, NO FLO, NO VIS CUT, TR INTER-XLN POR			CN
<u> </u>	2		DOLO- OFF WHT, HRD, MD-XLN, SUCRO MTRX THRU, TR GLAUC, NO FLO, NO VIS CUT, PR/FR INTER-XLN POR THRU			
R.T.D. 3900'	3900		FINISH E-LOG 1:30 A.M. 01/26/19	8:16 P.M. 01/25/19		
L.T.D. 3698'						

QUALI		L CEMENTING, IN	C.
one 785-483-2025 Cell 785-324-1041	Home Office P.O. Bo	ox 32 Russell, KS 67665 No.	1178
Date 1-18-19 16		County State On Location	12 0 15 AM
en en Calantin, in let kener et	Locati	07281+K-19,1W,11/85,	Els
Lease M+N-Gate	S Well No. 1-16	Owner	· · · · ·
Contractor Discovery	HQ to the second of the	To Quality Oilwell Cementing, Inc. You are hereby requested to rent cementing equipmen cementer and helper to assist owner or contractor to de	t and furnish o work as listed.
Hole Size: 12/4"	т.р. 306'	Charge Bild dog	and the second sec
Sinh.	Depth 306	Street	14 - 24 - C
Csg. 078 Tbg. Size	Depth	CityState	- 1
Tool	Depth	The above was done to satisfaction and supervision of owner	agent or contractor.
Cement Left in Csg. 15	Shoe Joint 15'	Cement Amount Ordered 425 80/25 3%C	
Meas Line	Displace 181/2 BLS	V2 # Flo-seal Used 390	- 40 - C-
EQUIP		Common 3/2	in a second second
Pumptrk 17 No. Cementer	noid	Poz. Mix 78	in the second second
Bulktrk 21 No. Driver		Gel. 8	a for solution and a second
Bulldrik O. U. Driver RGC	12	Calcium/4	No. 1997
JOB SERVICES	& REMARKS	Hulls	
N	id Cocculate	Salt	1. A.
Rat Hole	In CICACULC	Flowseal 225#	
Mouse Hole		Kol-Seal	
Centralizers		Mud CLR 48	1 ··· · · · · · · · · · · · · · · · · ·
Baskets	· · · · ·	CFL-117 or CD110 CAF 38	
D/V or Port Collar		Sand	
	20154	Handling 424 (4) 425	
USPN.	3700	Mileage	- 196a
- asua	10. C	FLOAT EQUIPMENT	10
		Guide Shoe	A
<u> </u>	10	Centralizer	
	MR.	Baskets	
(h)		AFU Inserts	1
		Float Shoe	a tao a Santa di tanana
		Latch Down	
	· · · · · · · · · · · · · · · · · · ·	$\label{eq:product} = \Phi_{\rm e}^{\rm e} W_{\rm e}^{\rm e} E_{\rm e}^{\rm e} \qquad $	and the second second
1	1		
	0	Pumptrk Charge Surface	N
and and the	01.1 /	Mileage 20	
A T	NA	Tax	s - 1-1-5-12" -
the state of the s	and the second	Discount	
X Signature	ाः सः महिद्दिर्ह्ना सः स्टूर्व्		

	TY OILWI	ELL CEMENTING, INC.
.025		Tax I.D.# 20-2886107           O. Box 32 Russell, KS 67665         No. 1211
26-19 16	5	County State On Location Finish
Lease MAN Gate	S Well No./-/6	Owner To Quality Oilwell Cementing, Inc.
Contractor Di Scover/#	2	You are hereby requested to rent cementing equipment and furnish
Type Job Production Str	P	cementer and helper to assist owner or contractor to do work as listed. Charge R, 7 h 0 /
Hole Size 7, 18	T.D. 3900	To Dird Dog O.
Csg. 5/2 15.50#	Depth 3896	Street
Tbg. Size	Depth	City State
Tool	Depth	The above was done to satisfaction and supervision of owner agent or contract
Cement Left in Csg. 20,8"	Shoe Joint 20.84	Cement Amount Ordered 235 CP. Pro-C
Meas Line	Displace 921/2BC	- 10% Salt 5% gilsowith sagal mor de
	PANENT	Common 35 Querec
Pumptrk 16 No. Cementer Helper	saig	Poz. Mix
Bulktrk No. Driver DN	ि पर	Gel.
Bulktrk / 4 No. Driver	n/	Calcium
JOB SERVICE	S & REMARKS	Hulls
Remarks:		Salt /7
Rat Hole 30.5K	*	Flowseal
Mouse Hole 205514		Kol-Seal 950 H
Centralizers 1 2 5 7 9	11315	Mud CLR 48 500 901
Baskets #//e	11,1210	CFL-117 or CD110 CAF 38
D/V or Port Collar		Sand
-11 280/ 1	B.Man 2820	Handling 261
Sie sette sogle	Day 110 3825	
22t. Cinculation. IV	mp songal mul flust	FLOAT EQUIPMENT
Flug Katholes Mouse	1 2 1	
With 10956. Clar	lines + Display Phy	Centralizer 8
Citypressore dom	500 9	
Flug land to lo	300 "	Baskets
		AFU Inserts
	1 125	Float Shoe
	Ch all	Latch Down /
	1	
	9	
	part in the	Pumptrk Charge Drod String
/		Mileage 20
1AD		Tax
AUT		Discount
X Signature	Сно. — 25	Total Charge



# DRILL STEM TEST REPORT

Prepared For:

Bird Dog Oll LLC

1801 Broadway Suite 200 Denver ,Colorado 80202

ATTN: Justin Carter

M&N-Gates #1-16

# 16-22s-13w Stafford

 Start Date:
 2019.01.22 @ 00:48:00

 End Date:
 2019.01.22 @ 06:38:00

 Job Ticket #:
 01072
 DST #:
 1

Eagle Testers 1309 Patton Road Great Bend, Kansas 67530 620-791-7394

Printed: 2019.01.22 @ 07:13:35

4		Bird Dog Oll LLC		16.0	00- 10-	Claff	and	
	leatera				229-13w			
		1801 Broadw ay Suite 200 80202	) Denver ,Colorado		N-Gates			
Sina				Job 7	Ticket: 01	072	DS	ST#:1
-		ATTN: Justin Carter		Test	Start: 20	019.01.2	2 @ 00:48:	00
ENERAL	INFORMATION:							
ormation: Deviated:	Kansas City "C" No Whipstock:	ft (KB)		Test	T	-		
ime Tool Op	bened: 01:49:00 ded: 06:38:00	П (КВ)		Teste Unit N	er: C	Gene Bu		n Hole (Initial)
nterval:	3429.00 ft (KB) To 3446	6.00 ft (KB) (TVD)		Refe	rence Ele	vations	: 1909	9.00 ft (KB)
otal Depth:	3446.00 ft (KB) (TVD							1.00 ft (CF)
ole Diameter	er: 7.88 inchesHole C	Condition: Fair			KB to	o GR/CF	-: {	8.00 ft
erial #: 9	91716 Outside	Second Second						
ress@RunD				Capacity:				0.00 psig
tart Date: tart Time:	2019.01.22 12:28:00	End Date: End Time:	2019.01.22 19:16:00	Last Calib. Time On B		010.01	2019.0 <sup>-</sup> .22 @ 14:28	
ter tinno.	12.20.00		13.10.00	Time Off E			.22 @ 14:20	
	1st Shut-In 30 M 2nd Opening 45 Mir 2nd Shut-In 90 M Pressure vs. Time	inutes w eak building blow ⊺ I⊲inutes	built to 12 inches int		ESSUR	ESUN	MARY	
			built to 12 inches int	to the water				
	2nd Opening 45 Mir 2nd Shut-In 90 M	inutes w eak building blow ⊺ I⊲inutes	built to 12 inches int		ESSUR	ESUN	MMARY	
70	2nd Opening 45 Mir 2nd Shut-In 90 M	inutes w eak building blow ⊺ I⊲inutes	Time	PR	Temp		MMARY	
	2nd Opening 45 Mir 2nd Shut-In 90 M Pressure vs. Time	inutes w eak building blow l kinutes	Time (Min.)	PR Pressure (psig)	Temp (deg F)	Anno	tation	
	2nd Opening 45 Mir 2nd Shut-In 90 M Pressure vs. Time	inutes w eak building blow l kinutes	Time	PR	Temp (deg F) 95.76	Anno Initial H		
800	2nd Opening 45 Mir 2nd Shut-In 90 M Pressure vs. Time	inutes w eak building blow l kinutes	Time (Min.) 0 1 1 16	Pressure (psig) 1702.95 42.11 69.89	Temp (deg F) 95.76 95.82 96.04	Anno Initial H Open 1 Shut-In	vtation lydro-static lo Flow (1) h(1)	
800	2nd Opening 45 Mir 2nd Shut-In 90 M Pressure vs. Time	inutes w eak building blow l kinutes	Time (Min.) 0 1 1 16 45	Pressure (psig) 1702.95 42.11 69.89 832.04	Temp (deg F) 95.76 95.82 96.04 99.78	Anno Initial H Open T Shut-In End Sh	Nation Noro-static To Flow (1) n(1) nut-In(1)	
50	2nd Opening 45 Mir 2nd Shut-In 90 M Pressure vs. Time	inutes w eak building blow l kinutes	Time (Min.) 0 1 16 45 46	PR Pressure (psig) 1702.95 42.11 69.89 832.04 76.72	Temp (deg F) 95.76 95.82 96.04 99.78 99.80	Anno Initial H Open T Shut-In End Sh Open T	hydro-static To Flow (1) h(1) hut-ln(1) To Flow (2)	
250	2nd Opening 45 Mir 2nd Shut-In 90 M Pressure vs. Time	inutes w eak building blow l kinutes	Time (Min.) 0 1 1 50 16 45 46 90 7 <sup>2</sup> (se 181	Pressure (psig) 1702.95 42.11 69.89 832.04	Temp (deg F) 95.76 95.82 96.04 99.78 99.80 104.87 109.31	Anno Initial H Open T Shut-In End Sh Open T Shut-In End Sh	tation lydro-static Fo Flow (1) h(1) hut-ln(1) Fo Flow (2) h(2) hut-ln(2)	
750	2nd Opening 45 Mir 2nd Shut-In 90 M Pressure vs. Time	inutes w eak building blow l kinutes	Time (Min.) 0 1 1 16 45 46 90	PR Pressure (psig) 1702.95 42.11 69.89 832.04 76.72 129.84	Temp (deg F) 95.76 95.82 96.04 99.78 99.80 104.87 109.31	Anno Initial H Open T Shut-In End Sh Open T Shut-In End Sh	tation lydro-static Fo Flow (1) h(1) hut-In(1) Fo Flow (2) h(2)	
750	2nd Opening 45 Mir 2nd Shut-In 90 M Pressure vs. Time	inutes w eak building blow l kinutes	Time (Min.) 0 1 1 55 16 45 46 90 7 <sup>2</sup> (deg 7 <sup>7</sup> ) 182	PR Pressure (psig) 1702.95 42.11 69.89 832.04 76.72 129.84 837.21	Temp (deg F) 95.76 95.82 96.04 99.78 99.80 104.87 109.31	Anno Initial H Open T Shut-In End Sh Open T Shut-In End Sh	tation lydro-static Fo Flow (1) h(1) hut-ln(1) Fo Flow (2) h(2) hut-ln(2)	
	2nd Opening 45 Mir 2nd Shut-In 90 M Pressure vs. Time	inutes w eak building blow l kinutes	Time (Min.) 0 1 1 0 16 16 45 46 90 70 (485 5) 181 182	PR Pressure (psig) 1702.95 42.11 69.89 832.04 76.72 129.84 837.21	Temp (deg F) 95.76 95.82 96.04 99.78 99.80 104.87 109.31	Anno Initial H Open T Shut-In End Sh Open T Shut-In End Sh	tation lydro-static Fo Flow (1) h(1) hut-ln(1) Fo Flow (2) h(2) hut-ln(2)	
700	2nd Opening 45 Mir 2nd Shut-In 90 M	inutes w eak building blow kinutes	Time (Min.) 0 1 1 55 16 45 46 90 7 <sup>2</sup> (deg 7 <sup>7</sup> ) 182	PR Pressure (psig) 1702.95 42.11 69.89 832.04 76.72 129.84 837.21	Temp (deg F) 95.76 95.82 96.04 99.78 99.80 104.87 109.31	Anno Initial H Open T Shut-In End Sh Open T Shut-In End Sh	tation lydro-static Fo Flow (1) h(1) hut-ln(1) Fo Flow (2) h(2) hut-ln(2)	
	2nd Opening 45 Mir 2nd Shut-In 90 M	inutes w eak building blow l kinutes	Time (Min.) 0 1 1 55 16 45 46 90 7 <sup>2</sup> (deg 7 <sup>7</sup> ) 182	PR Pressure (psig) 1702.95 42.11 69.89 832.04 76.72 129.84 837.21	Temp (deg F) 95.76 95.82 96.04 99.78 99.80 104.87 109.31	Anno Initial H Open T Shut-In End Sh Open T Shut-In End Sh	tation lydro-static Fo Flow (1) h(1) hut-ln(1) Fo Flow (2) h(2) hut-ln(2)	
700	2nd Opening 45 Mir 2nd Shut-In 90 M	inutes w eak building blow kinutes	Time (Min.) 0 1 1 55 16 45 46 90 7 <sup>2</sup> (deg 7 <sup>7</sup> ) 182	PR Pressure (psig) 1702.95 42.11 69.89 832.04 76.72 129.84 837.21	Temp (deg F) 95.76 95.82 96.04 99.78 99.80 104.87 109.31 109.47	Anno Initial H Open T Shut-In End Sh Open T Shut-In End Sh	Nydro-static To Flow (1) h(1) fo Flow (2) h(2) hut-In(2) ydro-static	
200 200 779 200 200 200 200 200 200 200 200 200 20	Pressure vs. Time	inutes w eak building blow kinutes	Time (Min.) 0 1 1 55 16 45 46 90 7 <sup>2</sup> (deg 7 <sup>7</sup> ) 182	PR Pressure (psig) 1702.95 42.11 69.89 832.04 76.72 129.84 837.21	Temp (deg F) 95.76 95.82 96.04 99.78 99.80 104.87 109.31 109.47	Anno Initial H Open T Shut-In End Sh Open T Shut-In End Sh Final H	Nydro-static To Flow (1) h(1) fo Flow (2) h(2) hut-In(2) ydro-static	Gas Rate (Mct/d)
500 500 500 500 500 500 500 500 500 500	2nd Opening 45 Mir 2nd Shut-In 90 M	ere 9000 Temperature of the second se	Time (Min.) 0 1 1 55 16 45 46 90 7 <sup>2</sup> (deg 7 <sup>7</sup> ) 182	PR Pressure (psig) 1702.95 42.11 69.89 832.04 76.72 129.84 837.21	Temp (deg F) 95.76 95.82 96.04 99.78 99.80 104.87 109.31 109.47 Gas	Anno Initial H Open T Shut-In End Sh Open T Shut-In End Sh Final H	tation lydro-static Fo Flow (1) h(1) nut-In(1) Fo Flow (2) h(2) hut-In(2) hut-In(2) hydro-static	Gas Rate (Mct/d)
200 200 200 200 200 200 200 200	2nd Opening 45 Mir 2nd Shut-In 90 M	Particular and a set of the set o	Time (Min.) 0 1 1 55 16 45 46 90 7 <sup>2</sup> (deg 7 <sup>7</sup> ) 182	PR Pressure (psig) 1702.95 42.11 69.89 832.04 76.72 129.84 837.21	Temp (deg F) 95.76 95.82 96.04 99.78 99.80 104.87 109.31 109.47 Gas	Anno Initial H Open T Shut-In End Sh Open T Shut-In End Sh Final H	tation lydro-static Fo Flow (1) h(1) nut-In(1) Fo Flow (2) h(2) hut-In(2) hut-In(2) hydro-static	Gas Rate (Mcl/d)
200 200 200 200 200 200 200 200	2nd Opening 45 Mir 2nd Shut-In 90 M Pressure vs. Time Provide and a state of the st	Volume (bbl) 0.24 0.00 1.19	Time (Min.) 0 1 1 55 16 45 46 90 7 <sup>2</sup> (deg 7 <sup>7</sup> ) 182	PR Pressure (psig) 1702.95 42.11 69.89 832.04 76.72 129.84 837.21	Temp (deg F) 95.76 95.82 96.04 99.78 99.80 104.87 109.31 109.47 Gas	Anno Initial H Open T Shut-In End Sh Open T Shut-In End Sh Final H	tation lydro-static Fo Flow (1) h(1) nut-In(1) Fo Flow (2) h(2) hut-In(2) hut-In(2) hydro-static	Gas Rate (Mct/d)
20 20 20 20 20 20 20 20 20 20	2nd Opening 45 Mir 2nd Shut-In 90 M	reteres	Time (Min.) 0 1 1 55 16 45 46 90 7 <sup>2</sup> (deg 7 <sup>7</sup> ) 182	PR Pressure (psig) 1702.95 42.11 69.89 832.04 76.72 129.84 837.21	Temp (deg F) 95.76 95.82 96.04 99.78 99.80 104.87 109.31 109.47 Gas	Anno Initial H Open T Shut-In End Sh Open T Shut-In End Sh Final H	tation lydro-static Fo Flow (1) h(1) nut-In(1) Fo Flow (2) h(2) hut-In(2) hut-In(2) hydro-static	Gas Rate (Mct/d)

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	Bird Dog Oll LLC		16-	22s-13w	Stafford	1	
<b>Biesters</b>	1801 Broadw ay Suite 200 De	enver Colorado		N-Gates			
	80202	enver, colorado		Ticket: 01		DS1	Γ#:1
Gour Sund Runne	ATTN: Justin Carter			t Start: 20			
ENERAL INFORMATION:							
ormation: Kansas City "C"							
eviated: No Whipstock: ime Tool Opened: 01:49:00 ime Test Ended: 06:38:00	ft (KB)		Tes		Gene Budig		Hole (Initial)
terval:3429.00 ft (KB) To3446otal Depth:3446.00 ft (KB) (TVDole Diameter:7.88 inchesHole C	)		Ref	erence Eev KB to	vations: o GR/CF:	1901.	.00 ft (KB) .00 ft (CF) .00 ft
erial #: 9119 Inside							
ress@RunDepth: 835.46 psig @ tart Date: 2019.01.22 tart Time: 12:28:00	3441.00 ft (KB) End Date: End Time:	2019.01.22 19:16:29	Capacity Last Calil Time On Time Off	o.: Btm: 20	019.01.22	2019.01. @ 14:28:	:30
9119 Pressure	9119 Temperature	Time	Pressure	Temp	Annotatio		
Pressure vs. Time			PF	RESSURE	E SUMM	ARY	
750 Mining		(Min.)	(psig)	(deg F)			
		• 0 1	1715.31 40.39		Initial Hydr Open To F		
20		12	61.11		Shut-In(1)	low (1)	
	17	45	834.04		End Shut-I	n(1)	
		Temperati	72.06		Open To F	low (2)	
750 V / Particular()	bullhoud?	90 (ting 181	123.30 835.46		Shut-In(2) End Shut-I	n(2)	
		<sup>3</sup> 182	1609.41	and the second se	Final Hydro		
25							
	· · · · ·			Gas	Rates		
e Jan 2010 31M Time (Haan)	· · · · ·			Gas Choke (inc	Rates	re (psig)	Gas Rate (Mct/d)
e Jan 2000 B Jan				-		re (psig)	Gas Rate (Mcf/d)
a Jan 2019 31 March 1990 Arren (Harr) Length (ff) Description	ana Volume (bbl)			-		re (psig)	Gas Rate (Mct/d)
In Jan 2000 31 Temp (Hann) Recovery Length (ft) Description 30.000 SLIGHTLY OIL CUT MUD	Volume (bbl) 0.24 0.00			-		re (psig)	Gas Rate (Mct/d)

Printed: 2019.01.22 @ 07:13:36

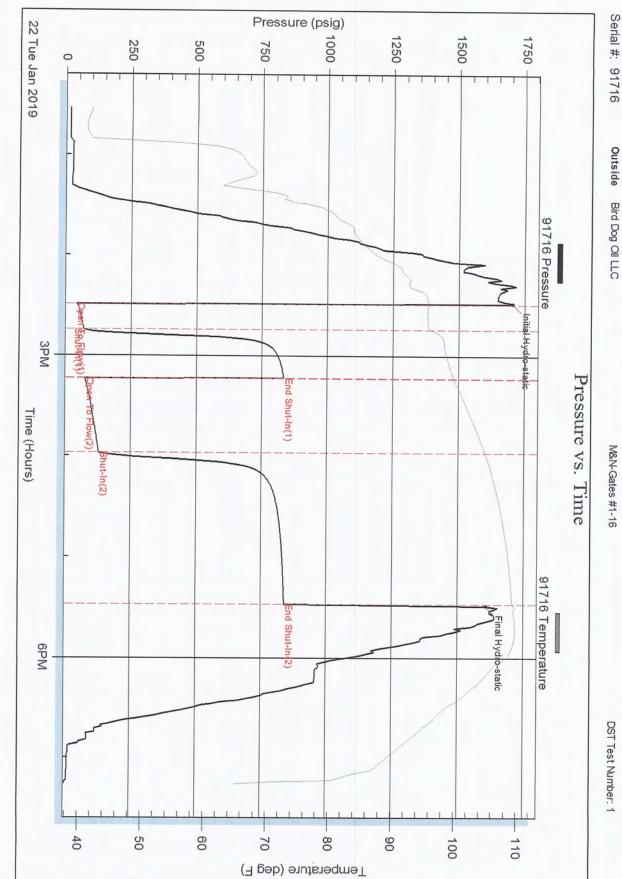
	The	2	DRI	LL ST	EM TEST	REPO	RT	TOOL DIAGRAI
	gue	2115	Bird Do	g Oll LLC			16-22s-13w Stafford	1
			1801 B	roadw ay S	uite 200 Denver	,Colorado	M&N-Gates #1-16	
amas	2mg P	20000	80202				Job Ticket: 01072	DST#:1
Sum C			ATTN:	Justin Car	ter		Test Start: 2019.01.22 @	00:48:00
Tool Informatio	on		ļ					
Drill Pipe:	Length:	3093.00 ft	Diameter:	3.80	inches Volume:	43.39 bbl	Tool Weight:	2000.00 lb
Heavy Wt. Pipe:	Length:	310.00 ft	Diameter:	2.86	inches Volume:	2.46 bbl		20000.00 lb
Drill Collar:	Length:	0.00 ft	Diameter:	2.25	inches Volume:	0.00 bbl	Weight to Pull Loose:	63000.00 lb
Drill Pipe Above H	KB.	4.00 ft			Total Volume:	45.85 bbl		0.00 ft
Depth to Top Pac		3429.00 ft					String Weight: Initial	58000.00 lb
Depth to Bottom I		ft					Final	58000.00 lb
Interval betw een		17.00 ft						
Tool Length:		47.00 ft						
Number of Packe	ers:	2	Diameter:	6.78	inches			
Tool Comments:								
	on	Le	ngth (ft)	Serial No	. Position	Depth (ft)	Accum. Lengths	
Tool Descriptic	on	Le	<b>ngth (ft)</b> 5.00	Serial No	. Position	<b>Depth (ft)</b> 3404.00	Accum. Lengths	
<b>Tool Descriptic</b> Shut In Tool	on	Le		Serial No	. Position		Accum. Lengths	
<b>Tool Descriptic</b> Shut In Tool Hydraulic tool	on	Le	5.00	Serial No	. Position	3404.00	Accum. Lengths	
<b>Tool Descriptic</b> Shut In Tool Hydraulic tool Jars	on	Le	5.00 5.00	Serial No	. Position	3404.00 3409.00	Accum. Lengths	
<b>Tool Descriptic</b> Shut In Tool Hydraulic tool Jars Safety Joint	on	Le	5.00 5.00 5.00	Serial No	. Position	3404.00 3409.00 3414.00	Accum. Lengths	Bottom Of Top Packer
<b>Tool Descriptic</b> Shut In Tool Hydraulic tool Jars Safety Joint Packer	on	Le	5.00 5.00 5.00 5.00	Serial No	. Position	3404.00 3409.00 3414.00 3419.00		Bottom Of Top Packer
<b>Tool Descriptic</b> Shut In Tool Hydraulic tool Jars Safety Joint Packer Packer	on	Le	5.00 5.00 5.00 5.00 5.00	Serial No		3404.00 3409.00 3414.00 3419.00 3424.00		Bottom Of Top Packer
Tool Comments: Tool Descriptic Shut In Tool Hydraulic tool Jars Safety Joint Packer Packer Packer Anchor Recorder	on	Le	5.00 5.00 5.00 5.00 5.00 5.00	Serial No 9119	Fluid	3404.00 3409.00 3414.00 3419.00 3424.00 3429.00		Bottom Of Top Packer
<b>Tool Descriptic</b> Shut In Tool Hydraulic tool Jars Safety Joint Packer Packer Anchor Recorder	on	Le	5.00 5.00 5.00 5.00 5.00 5.00 5.00 12.00		Fluid	3404.00 3409.00 3414.00 3419.00 3424.00 3429.00 3441.00		Bottom Of Top Packer
<b>Tool Descriptic</b> Shut In Tool Hydraulic tool Jars Safety Joint Packer Packer Anchor	on	Le	5.00 5.00 5.00 5.00 5.00 5.00 12.00 0.00	9119	Fluid	3404.00 3409.00 3414.00 3419.00 3424.00 3429.00 3441.00 3441.00	30.00	Bottom Of Top Packer

	DF	RILL STEM TEST REPOR	RT	FLU	D SUMMARY
	Bird I	Dog Oll LLC	16-22s-13v	v Stafford	
<u>Jeste</u>	1001	Presidence & the 2020 Descent of the st			
	8020	Broadw ay Suite 200 Denver ,Colorado	M&N-Gate		
Great Bands Ka	12003		Job Ticket: 0	1072 <b>DST</b>	#:1
	ATTN	I: Justin Carter	Test Start: 2	019.01.22 @ 00:48:0	0
lud and Cushion Info	rmation				
lud Type: Gel Chem		Cushion Type:		Oil API:	deg API
lud Weight: 9.00 lb/	/gal	Cushion Length:	ft	Water Salinity:	ppm
iscosity: 55.00 se		Cushion Volume:	bbl		
later Loss: 6.40 in	3	Gas Cushion Type:			
•	ım.m	Gas Cushion Pressure:	psig		
alinity: 6500.00 pp Iter Cake: 1.00 inc					
ecovery Information					
		Recovery Table			
	Length ft	Description	Volume bbl		
	30.00	SLIGHTLY OIL CUT MUD	0.238		
	0.00	8%Oil 62%Mud 30% Water	0.000	•	
L	150.00	Muddy Water 10% Mud 90% Watere	1.192	1	
L	0.00	chlorides 56000	0.000		



Ref. No: 01072

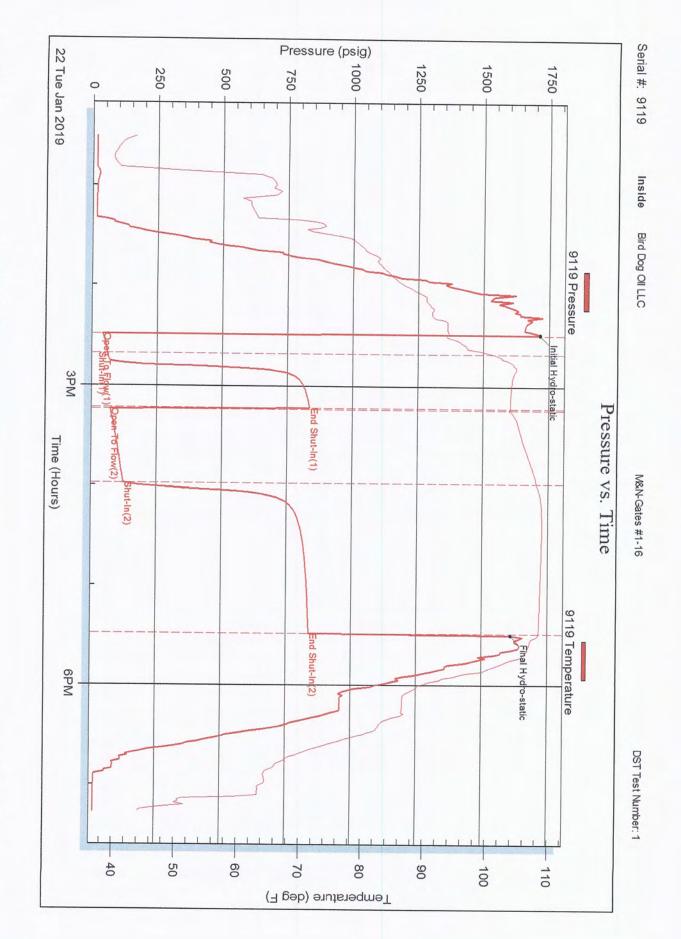
Eagle Testers





Ref. No: 01072

Eagle Testers





# DRILL STEM TEST REPORT

Prepared For:

Bird Dog Oll LLC

1801 Broadway Suite 200 Denver ,Colorado 80202

ATTN: Justin Carter

## M&N-Gates #1-16

## 16-22s-13w Stafford

 Start Date:
 2019.01.22 @ 14:21:00

 End Date:
 2019.01.22 @ 19:48:00

 Job Ticket #:
 01073
 DST #:
 2

Eagle Testers 1309 Patton Road Great Bend, Kansas 67530 620-791-7394

Printed: 2019.01.22 @ 20:00:04

		Bird Dog Oll LLC			16	-22s-13w	v Sta	fford	
	esters	1801 Broadw ay Suite	200 Denver	,Colorado		&N-Gate			
ama	Bond Banna	80202				Ticket: 0			T#:2
Sherry 6	Sund Kunter	ATTN: Justin Carter			Tes	st Start: 20	019.01	1.22 @ 14:21:	
GENERAL IN	NFORMATION:				-				
Formation: Deviated:	Kansas City :E & F: No Whipstock:	(LCD)							
Time Tool Open Time Test Ende	ned: 16:07:00	ft (KB)			Tes	ter:	Conve Gene I 1	entional Botton Budig	n Hole (Initial)
Interval:	3470.00 ft (KB) To 35				Ref	erence 🖽	evatior	ns: 1909	9.00 ft (KB)
Total Depth: Hole Diameter:	3500.00 ft (KB) (TV 7.88 inchesHole					KD +	CD/		1.00 ft (CF)
					-	NBI	to GR/0	UF. 8	3.00 ft
Serial #: 91									
Press@RunDep Start Date:	pth: 408.14 psig ( 2019.01.22	@ 3495.00 ft (KB) End Date:	20	19.01.22	Capacity Last Cali			5000 2019.01	0.00 psig
Start Time:	14:21:00	End Time:		19:46:00	Time On		2019.0	1.22 @ 16:06	
					Time Off	Btm:	2019.0	01.22 @ 17:51	:00:
TEST COMM	2nd Shut-In 30 M	Vinutes Vinutes weak blow for 1 Vinutes							
EST COMM	1st Shut-In 30 M 2nd Opening 30 M	Vinutes Vinutes weak blow for 1 Vinutes						JMMARY	
	1st Shut-In 30 M 2nd Opening 30 M 2nd Shut-In 30 M	Vinutes Vinutes weak blow for 1 Vinutes		creased to	Pressure	RESSUF Temp	RE SL	JMMARY	
1759	1st Shut-In 30 M 2nd Opening 30 M 2nd Shut-In 30 M Pressure vs. Th	Vinutes Vinutes weak blow for 1 Vinutes	0 Minutes de	creased to	PI	RESSUF	RE SU	notation	
	1st Shut-In 30 M 2nd Opening 30 M 2nd Shut-In 30 M Pressure vs. Th	Vinutes Vinutes weak blow for 1 Vinutes	0 Minutes de	Time (Min.)	Pressure (psig) 1725.19 49.17	RESSUF Temp (deg F) 93.66 93.77	RE SU Anr Initial Open	notation Hydro-static n To Flow (1)	
1759	1st Shut-In 30 M 2nd Opening 30 M 2nd Shut-In 30 M Pressure vs. Th	Vinutes Vinutes weak blow for 1 Vinutes	0 Minutes de	Time (Min.) 0 1 16	Pressure (psig) 1725.19 49.17 51.01	RESSUF Temp (deg F) 93.66 93.77 94.20	RE SU Anr Initial Open Shut-	Hydro-static To Flow (1) -In(1)	
1729	1st Shut-In 30 M 2nd Opening 30 M 2nd Shut-In 30 M Pressure vs. Th	Vinutes Vinutes weak blow for 1 Vinutes	0 Minutes de	Time (Min.) 1	Pressure (psig) 1725.19 49.17	RESSUF Temp (deg F) 93.66 93.77 94.20 95.04	E SU Anr Initial Open Shut- End S	notation Hydro-static n To Flow (1)	
1730 1730 1730 1730 1730 1730 1730 1730	1st Shut-In 30 M 2nd Opening 30 M 2nd Shut-In 30 M Pressure vs. Th	Vinutes Vinutes weak blow for 1 Vinutes	0 Minutes de	Time (Min.) 0 1 16 44 45 74	Pressure (psig) 1725.19 49.17 51.01 627.47 53.27 56.27	RESSUF Temp (deg F) 93.66 93.77 94.20 95.04 95.08 96.10	RE SU Anr Initial Open Shut- End S Open Shut-	Hydro-static To Flow (1) -In(1) Shut-In(1) To Flow (2) -In(2)	
1750	1st Shut-In 30 M 2nd Opening 30 M 2nd Shut-In 30 M Pressure vs. Th	Vinutes Vinutes weak blow for 1 Vinutes	0 Minutes de	Time (Min.) 0 1 16 44 45 74 104	Pressure (psig) 1725.19 49.17 51.01 627.47 53.27 56.27 408.14	RESSUF Temp (deg F) 93.66 93.77 94.20 95.04 95.08 96.10 97.58	E SU Anr Initial Open Shut- End S Open Shut- End S	Hydro-static To Flow (1) -In(1) Shut-In(1) To Flow (2) -In(2) Shut-In(2)	
1730 1530 1530 1530 1530	1st Shut-In 30 M 2nd Opening 30 M 2nd Shut-In 30 M Pressure vs. Th DDD Pressure International Action of the second	Vinutes Vinutes weak blow for 1 Vinutes	0 Minutes de	Time (Min.) 0 1 16 44 45 74	Pressure (psig) 1725.19 49.17 51.01 627.47 53.27 56.27	RESSUF Temp (deg F) 93.66 93.77 94.20 95.04 95.08 96.10	E SU Anr Initial Open Shut- End S Open Shut- End S	Hydro-static To Flow (1) -In(1) Shut-In(1) To Flow (2) -In(2)	
1759 1500	1st Shut-In 30 M 2nd Opening 30 M 2nd Shut-In 30 M Pressure vs. Th DDD Pressure International Action of the second	Vinutes Vinutes weak blow for 1 Vinutes	0 Minutes de	Time (Min.) 0 1 16 44 45 74 104	Pressure (psig) 1725.19 49.17 51.01 627.47 53.27 56.27 408.14	RESSUF Temp (deg F) 93.66 93.77 94.20 95.04 95.08 96.10 97.58	E SU Anr Initial Open Shut- End S Open Shut- End S	Hydro-static To Flow (1) -In(1) Shut-In(1) To Flow (2) -In(2) Shut-In(2)	
1750         -           1500         -           1500         -           1500         -           1500         -           1500         -           1500         -           1500         -	1st Shut-In 30 M 2nd Opening 30 M 2nd Shut-In 30 M Pressure vs. Th DDD Pressure International Action of the second	Vinutes Vinutes weak blow for 1 Vinutes	0 Minutes de	Time (Min.) 0 1 16 44 45 74 104	Pressure (psig) 1725.19 49.17 51.01 627.47 53.27 56.27 408.14	RESSUF Temp (deg F) 93.66 93.77 94.20 95.04 95.08 96.10 97.58	E SU Anr Initial Open Shut- End S Open Shut- End S	Hydro-static To Flow (1) -In(1) Shut-In(1) To Flow (2) -In(2) Shut-In(2)	
	1st Shut-In 30 M 2nd Opening 30 M 2nd Shut-In 30 M Pressure vs. Th 90780 Pressure 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Vinutes Vinutes weak blow for 1 Vinutes	0 Minutes de	Time (Min.) 0 1 16 44 45 74 104	Pressure (psig) 1725.19 49.17 51.01 627.47 53.27 56.27 408.14	RESSUF Temp (deg F) 93.66 93.77 94.20 95.04 95.08 96.10 97.58	E SU Anr Initial Open Shut- End S Open Shut- End S	Hydro-static To Flow (1) -In(1) Shut-In(1) To Flow (2) -In(2) Shut-In(2)	
	1st Shut-In 30 M 2nd Opening 30 M 2nd Shut-In 30 M Pressure vs. Tr 90790 Plessure 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Vinutes Vinutes weak blow for 1 Vinutes me 9770 Temperature 7 Vintes and 7 Vintes a	0 Minutes de	Time (Min.) 0 1 16 44 45 74 104	Pressure (psig) 1725.19 49.17 51.01 627.47 53.27 56.27 408.14	RESSUF Temp (deg F) 93.66 93.77 94.20 95.04 95.08 96.10 97.58 97.63	E SU Anr Initial Open Shut- End S Open Shut- End S	Hydro-static To Flow (1) -In(1) Shut-In(1) To Flow (2) -In(2) Shut-In(2) Hydro-static	
1729 500 500 700 500 700 700 700 700 700 700	1st Shut-In 30 M 2nd Opening 30 M 2nd Shut-In 30 M Pressure vs. Th DFD Pressure Interpression Interp	Vinutes Vinutes weak blow for 1 Vinutes Tree Tree Tree Tree Tree Tree Tree Tr	0 Minutes de	Time (Min.) 0 1 16 44 45 74 104	Pressure (psig) 1725.19 49.17 51.01 627.47 53.27 56.27 408.14	RESSUF Temp (deg F) 93.66 93.77 94.20 95.04 95.08 96.10 97.58 97.63	RE SU Anr Initial Open Shut- End S Final Final	Hydro-static To Flow (1) -In(1) Shut-In(1) To Flow (2) -In(2) Shut-In(2) Hydro-static	Gas Rate (Mct/d)
1759 259 500 259 500 29 0 29 0 29 0 39 39 39 39 29 0 29 0 39 39 39 39 39 39 39 39 39 39	1st Shut-In 30 M 2nd Opening 30 M 2nd Shut-In 30 M Pressure vs. The DEFENDENCE INFORMATION INFORMATION INFORMATION INFORMATION INFORMATION INFORMATION INFORMATION INFORMATION	Vinutes Vinutes weak blow for 1 Vinutes 7078 Terpender 7078 Terpender 0784 754 Volume (bb ss than 0.24	0 Minutes de	Time (Min.) 0 1 16 44 45 74 104	Pressure (psig) 1725.19 49.17 51.01 627.47 53.27 56.27 408.14	RESSUF Temp (deg F) 93.66 93.77 94.20 95.04 95.08 96.10 97.58 97.63	RE SU Anr Initial Open Shut- End S Final Final	Hydro-static To Flow (1) -In(1) Shut-In(1) To Flow (2) -In(2) Shut-In(2) Hydro-static es	Gas Rate (Mct/d)
1759 1799 1799 1799 1799 1799 1799 1799	1st Shut-In 30 M 2nd Opening 30 M 2nd Shut-In 30 M Pressure vs. Th DFD Pressure Interpression Interp	Vinutes Vinutes weak blow for 1 Vinutes Tree Tree Tree Tree Tree Tree Tree Tr	0 Minutes de	Time (Min.) 0 1 16 44 45 74 104	Pressure (psig) 1725.19 49.17 51.01 627.47 53.27 56.27 408.14	RESSUF Temp (deg F) 93.66 93.77 94.20 95.04 95.08 96.10 97.58 97.63	RE SU Anr Initial Open Shut- End S Final Final	Hydro-static To Flow (1) -In(1) Shut-In(1) To Flow (2) -In(2) Shut-In(2) Hydro-static es	Gas Rate (Mct/d)
1759 1799 1799 1799 1799 1799 1799 1799	1st Shut-In 30 M 2nd Opening 30 M 2nd Shut-In 30 M Pressure vs. The DEFENDENCE INFORMATION INFORMATION INFORMATION INFORMATION INFORMATION INFORMATION INFORMATION INFORMATION	Vinutes Vinutes weak blow for 1 Vinutes 7078 Terpender 7078 Terpender 0784 754 Volume (bb ss than 0.24	0 Minutes de	Time (Min.) 0 1 16 44 45 74 104	Pressure (psig) 1725.19 49.17 51.01 627.47 53.27 56.27 408.14	RESSUF Temp (deg F) 93.66 93.77 94.20 95.04 95.08 96.10 97.58 97.63	RE SU Anr Initial Open Shut- End S Final Final	Hydro-static To Flow (1) -In(1) Shut-In(1) To Flow (2) -In(2) Shut-In(2) Hydro-static es	Gas Rate (Mct/d)
1759 259 500 259 500 29 0 29 0 29 0 39 39 39 39 29 0 29 0 39 39 39 39 39 39 39 39 39 39	1st Shut-In 30 M 2nd Opening 30 M 2nd Shut-In 30 M Pressure vs. The DEFENDENCE INFORMATION INFORMATION INFORMATION INFORMATION INFORMATION INFORMATION INFORMATION INFORMATION	Vinutes Vinutes weak blow for 1 Vinutes 7078 Terpender 7078 Terpender 0784 754 Volume (bb ss than 0.24	0 Minutes de	Time (Min.) 0 1 16 44 45 74 104	Pressure (psig) 1725.19 49.17 51.01 627.47 53.27 56.27 408.14	RESSUF Temp (deg F) 93.66 93.77 94.20 95.04 95.08 96.10 97.58 97.63	RE SU Anr Initial Open Shut- End S Final Final	Hydro-static To Flow (1) -In(1) Shut-In(1) To Flow (2) -In(2) Shut-In(2) Hydro-static es	Gas Rate (Mct/d

er ,Colorado 2019.01.22 19:46:30	Test Type: C Tester: G Unit No: 1 Reference Eev KB to Capacity: Last Calib.: Time On Btm: 20	s <b>#1-16</b> 073 DST#: 2 19.01.22 @ 14:21:00 Conventional Bottom Hole (Initial) Gene Budig
2019.01.22	Job Ticket: 010 Test Start: 20 Test Type: C Tester: C Unit No: 1 Reference Eev KB to Capacity: Last Calib.: Time On Btm: 20	073 DST#: 2 19.01.22 @ 14:21:00 Conventional Bottom Hole (Initial) Gene Budig vations: 1909.00 ft (KB) 1901.00 ft (CF) 0 GR/CF: 8.00 ft psig 2019.01.22
	Test Start: 20 Test Type: C Tester: G Unit No: 1 Reference Eev KB to Capacity: Last Calib.: Time On Btm: 20	19.01.22 @ 14:21:00 Conventional Bottom Hole (Initial) Gene Budig vations: 1909.00 ft (KB) 1901.00 ft (CF) 0 GR/CF: 8.00 ft psig 2019.01.22
	Test Type: C Tester: G Unit No: 1 Reference Eev KB to Capacity: Last Calib.: Time On Btm: 20	Conventional Bottom Hole (Initial) Gene Budig vations: 1909.00 ft (KB) 1901.00 ft (CF) o GR/CF: 8.00 ft psig 2019.01.22
	Tester: G Unit No: 1 Reference Eev KB to Capacity: Last Calib.: Time On Btm: 20	Aene Budig vations: 1909.00 ft (KB) 1901.00 ft (CF) o GR/CF: 8.00 ft psig 2019.01.22
	Tester: G Unit No: 1 Reference Eev KB to Capacity: Last Calib.: Time On Btm: 20	Aene Budig vations: 1909.00 ft (KB) 1901.00 ft (CF) o GR/CF: 8.00 ft psig 2019.01.22
	Tester: G Unit No: 1 Reference Eev KB to Capacity: Last Calib.: Time On Btm: 20	Aene Budig vations: 1909.00 ft (KB) 1901.00 ft (CF) o GR/CF: 8.00 ft psig 2019.01.22
	KB to Capacity: Last Calib.: Time On Btm: 20	1901.00 ft (CF) 9 GR/CF: 8.00 ft psig 2019.01.22
	Capacity: Last Calib.: Time On Btm: 20	1901.00 ft (CF) 9 GR/CF: 8.00 ft psig 2019.01.22
	Capacity: Last Calib.: Time On Btm: 20	psig 2019.01.22
	Last Calib.: Time On Btm: 20	2019.01.22
	Last Calib.: Time On Btm: 20	2019.01.22
	Time On Btm: 20	
	Time Off Btm: 20	019.01.22 @ 17:51:00
		Annotation
Time		
(Min.)	(psig) (deg F)	Initial I I and a secola
1		Initial Hydro-static Open To Flow (1)
17	46.69 91.83	Shut-In(1)
		End Shut-In(1) Open To Flow (2)
76		Shut-In(2)
105	402.04 95.16	End Shut-In(2)
106	1051.88 95.53	Final Hydro-static
	Gas	Pates
	Choke (inc	
L		
	Time (Min.) 0 1 17 45 46 76 105	Time         Pressure         Temp           (Min.)         (psig)         (deg F)           0         1672.47         91.58           1         45.42         90.61           17         46.69         91.83           45         631.15         92.98           46         48.51         92.84           76         51.58         93.91           105         402.04         95.16           106         1651.88         95.53

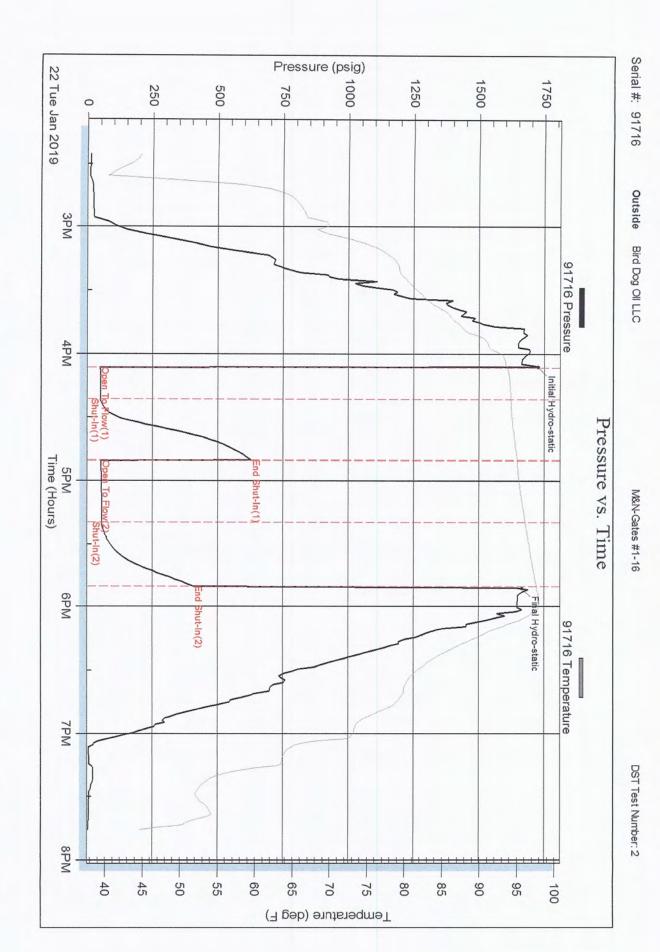
812	mi	N PA	DRI	LL ST	EM TEST	REPO	RT	TOOL DIAGRA
-		- mic	Bird Do	og Oll LLC			16-22s-13w Stafford	I
				Broadw ay S	uite 200 Denver	,Colorado	M&N-Gates #1-16	
ama	and for	among	80202				Job Ticket: 01073	DST#:2
Growe			ATTN:	Justin Car	ter		Test Start: 2019.01.22 @	⊉ 14:21:00
Tool Informatio	on							
Drill Pipe:		3153.00 ft	Diameter:	3.80	inches Volume:	44.23 bb	Tool Weight:	2000.00 lb
Heavy Wt. Pipe:	Length:	310.00 ft	Diameter:	2.86	inches Volume:	2.46 bb		
Drill Collar:	Length:	0.00 ft	Diameter:	2.25	inches Volume:	0.00 bb		
Drill Pipe Above H	KB:	23.00 ft			Total Volume:	46.69 bb		0.00 ft
Depth to Top Pac		3470.00 ft					String Weight: Initial	58000.00 lb
Depth to Bottom I	Packer:	ft					Final	58000.00 lb
nterval betw een	Packers:	30.00 ft						
Tool Length:		60.00 ft						
Number of Packe	ers:	2	Diameter:	6.75	inches			
our our our officiatio.								
Tool Comments:								
Tool Descriptic	on	Le	ngth (ft)	Serial No	. Position	Depth (ft)	Accum. Lengths	
<b>Tool Descriptic</b> Shut In Tool	on	Le	<b>ngth (ft)</b> 5.00	Serial No	. Position	<b>Depth (ft)</b> 3445.00	Accum. Lengths	
<b>Tool Descriptic</b> Shut In Tool	on	Le		Serial No	. Position		Accum. Lengths	
<b>Tool Descriptic</b> Shut In Tool Hydraulic tool Jars	on	Le	5.00	Serial No	. Position	3445.00	Accum. Lengths	
<b>Tool Descriptic</b> Shut In Tool Hydraulic tool Jars Safety Joint	on	Le	5.00 5.00	Serial No	. Position	3445.00 3450.00	Accum. Lengths	
<b>Tool Descriptic</b> Shut In Tool Hydraulic tool Jars Safety Joint	on	Le	5.00 5.00 5.00	Serial No	. Position	3445.00 3450.00 3455.00	Accum. Lengths	Bottom Of Top Packer
<b>Tool Descriptic</b> Shut In Tool Hydraulic tool Jars Safety Joint Packer Packer	on	Le	5.00 5.00 5.00 5.00	Serial No	. Position	3445.00 3450.00 3455.00 3460.00		Bottom Of Top Packer
<b>Tool Descriptic</b> Shut In Tool Hydraulic tool Jars Safety Joint Packer Packer Anchor	on	Le	5.00 5.00 5.00 5.00 5.00	Serial No		3445.00 3450.00 3455.00 3460.00 3465.00		Bottom Of Top Packer
<b>Tool Descriptic</b> Shut In Tool Hydraulic tool Jars Safety Joint Packer Packer Anchor Recorder	on	Le	5.00 5.00 5.00 5.00 5.00 5.00	Serial No 9119		3445.00 3450.00 3455.00 3460.00 3465.00 3470.00		Bottom Of Top Packer
Tool Description Shut In Tool Hydraulic tool Jars Safety Joint Packer Packer Anchor Recorder Recorder	<u>on</u>	Le	5.00 5.00 5.00 5.00 5.00 5.00 25.00		Fluid	3445.00 3450.00 3455.00 3460.00 3465.00 3470.00 3495.00		Bottom Of Top Packer
<b>Tool Descriptic</b> Shut In Tool Hydraulic tool Jars Safety Joint Packer Packer Anchor Recorder	on	Le	5.00 5.00 5.00 5.00 5.00 5.00 25.00 0.00	9119	Fluid	3445.00 3450.00 3455.00 3460.00 3465.00 3470.00 3495.00 3495.00	30.00	Bottom Of Top Packer

<ul> <li>1801 E</li> <li>80202</li> </ul>	og Oll LLC Broadw ay Suite 200 Denver ,Colorado Justin Carter Cushion Type: Cushion Length: Cushion Volume: Gas Cushion Type: Gas Cushion Pressure:	16-22s-13w Staffe M&N-Gates #1-16 Job Ticket: 01073 Test Start: 2019.01.2 Oil API: ft Water St bbl psig	<b>DST#</b> 2 @ 14:21:00	:2 deg API ppm
ation atim	Justin Carter Cushion Type: Cushion Length: Cushion Volume: Gas Cushion Type:	Job Ticket: 01073 Test Start: 2019.01.2 Oil API: ft Water Si bbl	<b>DST#</b> 2 @ 14:21:00	deg API
ATTN: ation at m	Justin Carter Cushion Type: Cushion Length: Cushion Volume: Gas Cushion Type:	Test Start: 2019.01.2 Oil API: ft Water St bbl	2 @ 14:21:00	deg API
ation ation	Cushion Type: Cushion Length: Cushion Volume: Gas Cushion Type:	Oil API: ft Water Si bbl		
ı at	Cushion Length: Cushion Volume: Gas Cushion Type:	ft Water Sabbl	alinity:	
ŋt m	Cushion Length: Cushion Volume: Gas Cushion Type:	ft Water Sabbl	alinity:	
ŋt m	Cushion Volume: Gas Cushion Type:	bbl	alinity :	ppm
m	Gas Cushion Type:			
		psig		
		haid		
	Recovery Table			
Length ft	Description	Volume bbl		
30.00	very slightly oil cut mud less than	0.238		
0.00	1 % oil 99%mud	0.000		
ength: 30	.00 ft Total Volume: 0.238 b	bl		
	30.00 0.00	30.00       very slightly oil cut mud less than         0.00       1 % oil 99%mud         ngth:       30.00 ft       Total Volume:       0.238 b         id Samples: 0       Num Gas Bombs:       0         ory Name:       Laboratory Location:	30.00     very slightly oil cut mud less than     0.238       0.00     1 % oil 99%mud     0.000       ngth:     30.00 ft     Total Volume:     0.238 bbl       id Samples: 0     Num Gas Bombs:     0     Serial #:       ory Name:     Laboratory Location:     Serial #:	30.00     very slightly oil cut mud less than     0.238       0.00     1 % oil 99%mud     0.000       ngth:     30.00 ft     Total Volume:     0.238 bbl       id Samples: 0     Num Gas Bombs:     0     Serial #:       ory Name:     Laboratory Location:     Serial #:



Ref. No: 01073

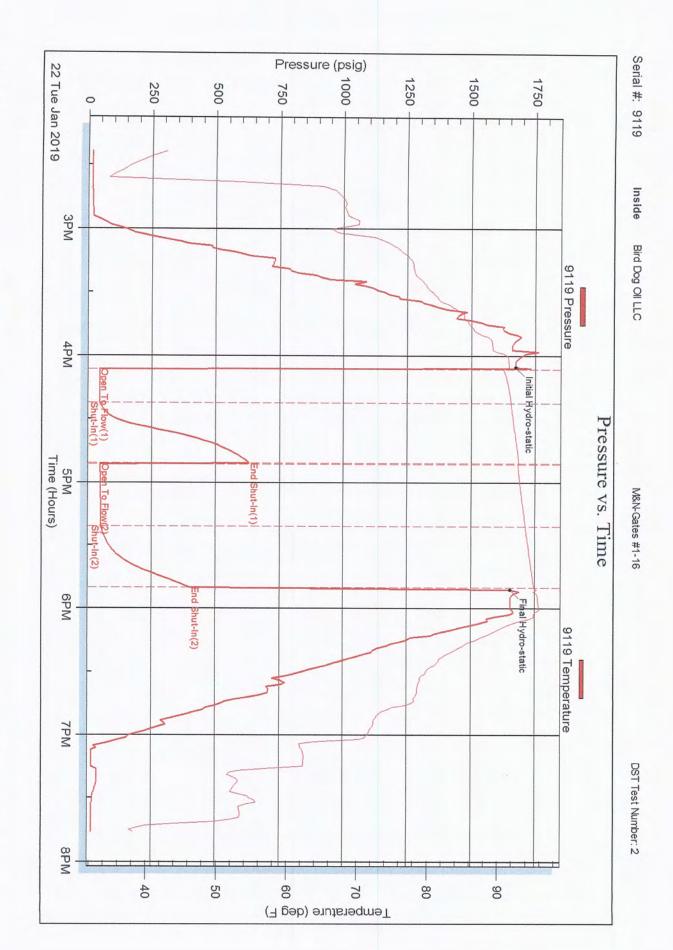
Printed: 2019.01.22 @ 20:00:06



Eagle Testers

Ref. No: 01073

Printed: 2019.01.22 @ 20:00:06





# DRILL STEM TEST REPORT

Prepared For: B

Bird Dog Oll LLC

1801 Broadway Suite 200 Denver ,Colorado 80202

ATTN: Justin Carter

M&N-Gates #1-16

## 16-22s-13w Stafford

 Start Date:
 2019.01.23 @ 04:49:00

 End Date:
 2019.01.23 @ 03:09:00

 Job Ticket #:
 01074
 DST #: 3

Eagle Testers 1309 Patton Road Great Bend, Kansas 67530

620-791-7394

Printed: 2019.01.23 @ 15:17:51

	Bird D	og Oll LLC		16-	-22s-13w	Staffor	d	
		Broadw ay Suite 200 Der	ver Colorado		N-Gates			
amo	Bond Comma 80202		wor ,colorado		Ticket: 01		De	T#:3
Jame	ATTN:	Justin Carter			t Start: 20			
GENERAL I	NFORMATION:							
Formation: Deviated: Time Tool Oper Time Test Ende		ft (KB)		Tes	ter: (	Conventio Gene Budi 1		n Hole (Initial)
Interval: Total Depth: Hole Diameter:	<b>3532.00 ft (KB) To 3552.00 ft</b> 3552.00 ft (KB) (TVD) 7.88 inchesHole Conditio				erence Be		1901	0.00 ft (KB) .00 ft (CF) 0.00 ft
Serial #: 91 Press@RunDe Start Date: Start Time: TEST COMM	Ppth: 799.88 psig @ 38 2019.01.23 E 04:49:00 E MENT: 1st Opening 15 Minutes	good blow back strong bloow see gas fl		Capacity Last Calil Time On Time Off	b.: Btm: 2	2019.01.23 2019.01.23	2019.01 3 @ 06:45	:00
	Pressure vs. Time			PF	RESSUR		/ARY	
1790	90780 Ressure 99	726 Temperalure	Time	Pressure	Temp	Annotat	ion	
1990 1259 1990 1990 1990 1990 1990 1990 1990 19	Band Carlos and Carlos		(Min.) 0 1 16 47 48 91 186 186 5 187	(psig) 1747.99 229.63 226.45 797.85 260.50 479.40 799.88 1676.53	96.89 96.92 99.00 102.64	Initial Hyd Open To Shut-In(1 End Shut- Open To Shut-In(2) End Shut- Final Hyd	Flow (1) ) -In(1) Flow (2) ) -In(2)	
		- 50	0 16 47 48 91 186	1747.99 229.63 226.45 797.85 260.50 479.40 799.88	91.92 92.29 94.97 96.89 96.92 99.00 102.64 102.68	Initial Hyd Open To Shut-In(1 End Shut- Open To Shut-In(2 End Shut-	Flow (1) ) -In(1) Flow (2) ) -In(2)	
250 250 250 250 250 250 250 250 250 250	Sind Trempleans) 2314 Trempleans) 2314 Recovery Description		0 16 47 48 91 186 187	1747.99 229.63 226.45 797.85 260.50 479.40 799.88 1676.53	91.92 92.29 94.97 96.89 96.92 99.00 102.64 102.68	Initial Hyd Open To Shut-In(1 End Shut- Open To Shut-In(2) End Shut- Final Hyd	Flow (1) ) -In(1) Flow (2) ) -In(2)	Gas Rate (Mct/d)
1999 1999 1999 1999 1999 1999 1999 199	Recovery Description Clean Gassy Oil 30% Gas 70% Oil		0 1 16 47 48 91 186 187 187	1747.99 229.63 226.45 797.85 260.50 479.40 799.88 1676.53	91.92 92.29 94.97 96.89 96.92 99.00 102.64 102.68 Gas Choke (in 0	Initial Hyd Open To Shut-In(1) End Shut- Dopen To Shut-In(2) End Shut- Final Hyd s Rates	Flow (1) ) -In(1) Flow (2) ) -In(2) ro-static ure (psig) 21.00	Gas Rate (Mct/d) 13.25
1500 1500	Sind Trempleans) 2314 Trempleans) 2314 Recovery Description		0 16 47 48 91 186 187	1747.99 229.63 226.45 797.85 260.50 479.40 799.88 1676.53 1676.53	91.92 92.29 94.97 96.89 99.00 102.64 102.68 Gas Choke (in 0.	Initial Hyd Open To Shut-In(1 End Shut- Open To Shut-In(2) End Shut- Final Hyd	Flow (1) ) -In(1) Flow (2) ) -In(2) ro-static	

Z 23		og Oll LLC		16-	-22s-13w	Staff	ord	
	1801 E 80202	Broadw ay Suite 200	Denver ,Colorado		N-Gates			
great		Justin Carter			Ticket: 01			ST#:3
		Justin Carter		les	st Start: 20	019.01.2	23 @ 04:49:	:00
	. INFORMATION:							
	Kansas City "H" No Whipstock: ened: 00:00:00 ded: 03:09:00	ft (KB)		Tes	ter: (	Conven Gene Bi 1		n Hole (Initial)
<b>nterval:</b> Total Depth: Hole Diamete	<b>3532.00 ft (KB) To 3552.00 ft</b> 3552.00 ft (KB) (TVD) r: 7.88 inchesHole Conditio			Ref	erence ⊟e KB t	evations o GR/Cl	190	9.00 ft (KB) 1.00 ft (CF) 8.00 ft
Serial #:	9119 Inside							
Press@RunE Start Date: Start Time:	2019.01.23 E	547.00 ft (KB) ind Date: ind Time:	2019.01.23 15:03:00	Capacity Last Calil Time On Time Off	b.: Btm: 2		5000 2019.0 23 @ 06:44 23 @ 09:50	4:30
IEST CON	IMENT:         1st Opening         15 Minutes           1st Shut-In         30 Minutes           2 nd opening         45 Minutes           2nd Shut-In         90 Minutes	good blow back strong bloow see ga		95				
	1st Shut-In 30 Minutes 2 nd opening 45 Minutes	good blow back strong bloow see ga			RESSUR	FSU	MARY	
EST COM	1st Shut-In 30 Minutes 2 nd opening 45 Minutes 2nd Shut-In 90 Minutres Pressure vs. Time	good blow back strong bloow see ga	as flow report	PF	RESSUR Temp		/IMARY tation	
1759	1st Shut-In 30 Minutes 2 nd opening 45 Minutes 2nd Shut-In 90 Minutres Pressure vs. Time	good blow back strong bloow see ga good blow back	Time (Min.)	PF		Anno		
1750	1st Shut-In 30 Minutes 2 nd opening 45 Minutes 2nd Shut-In 90 Minutres Pressure vs. Time	good blow back strong bloow see ga good blow back	Time (Min.) 0 1	Pressure (psig) 1779.71 196.88	Temp (deg F) 90.52 90.52	Anno Initial H Open 1	tation ydro-static o Flow (1)	
1750	1st Shut-In 30 Minutes 2 nd opening 45 Minutes 2nd Shut-In 90 Minutres Pressure vs. Time	good blow back strong bloow see ga good blow back	Time (Min.) 0 - 59 - 50 - 15 - 47	Pressure (psig) 1779.71	Temp (deg F) 90.52 90.52 91.17	Anno Initial H Open T Shut-In	tation ydro-static o Flow (1)	
17:0	1st Shut-In 30 Minutes 2 nd opening 45 Minutes 2nd Shut-In 90 Minutres Pressure vs. Time	good blow back strong bloow see ga good blow back	as flow report Time (Min.) 0 - 50 1 - 50 1 - 50 1 - 50 47 - 70 -	Pressure (psig) 1779.71 196.88 220.29 796.27 268.93	Temp (deg F) 90.52 90.52 91.17 93.00 92.89	Anno Initial H Open T Shut-In End Sh Open T	tation ydro-static To Flow (1) (1) ut-In(1) To Flow (2)	
1753	1st Shut-In 30 Minutes 2 nd opening 45 Minutes 2nd Shut-In 90 Minutres Pressure vs. Time	good blow back strong bloow see ga good blow back	Time (Min.) 0 - 59 - 50 - 15 - 47	Pressure (psig) 1779.71 196.88 220.29 796.27	Temp (deg F) 90.52 90.52 91.17 93.00 92.89 95.08 98.84	Anno Initial H Open T Shut-In End Sh Open T Shut-In End Sh	tation vdro-static o Flow (1) (1) ut-In(1) o Flow (2) (2)	
1770 1250 1255 1000 1000 1000 1000 1000 100	1st Shut-In 30 Minutes 2 nd opening 45 Minutes 2nd Shut-In 90 Minutres Pressure vs. Time	good blow back strong bloow see ga good blow back	Time (Min.) 0 - 50 - 50 - 50 - 50 - 70 - 70 - 70 - 70 - 70 - 70 - 70 - 7	Pressure (psig) 1779.71 196.88 220.29 796.27 268.93 460.90 796.02	Temp (deg F) 90.52 90.52 91.17 93.00 92.89 95.08 98.84	Anno Initial H Open T Shut-In End Sh Open T Shut-In End Sh	tation vdro-static o Flow (1) (1) ut-In(1) o Flow (2) (2) ut-In(2)	
17:9	1st Shut-In 30 Minutes 2 nd opening 45 Minutes 2nd Shut-In 90 Minutres Pressure vs. Time	good blow back strong bloow see ga good blow back	as flow report Time (Min.) 0 1 15 47 48 90 0 186 59	Pressure (psig) 1779.71 196.88 220.29 796.27 268.93 460.90 796.02	Temp (deg F) 90.52 90.52 91.17 93.00 92.89 95.08 98.84	Anno Initial H Open T Shut-In End Sh Open T Shut-In End Sh	tation vdro-static o Flow (1) (1) ut-In(1) o Flow (2) (2) ut-In(2)	
	1st Shut-In 30 Minutes 2 nd opening 45 Minutes 2nd Shut-In 90 Minutres Pressure vs. Time	good blow back strong bloow see ga good blow back	as flow report Time (Min.) 0 1 15 47 48 90 0 186 59	Pressure (psig) 1779.71 196.88 220.29 796.27 268.93 460.90 796.02	Temp (deg F) 90.52 91.17 93.00 92.89 95.08 98.84 99.19	Anno Initial H Open T Shut-In End Sh Open T Shut-In End Sh	tation ydro-static To Flow (1) (1) ut-In(1) To Flow (2) (2) ut-In(2) ydro-static	
279	1st Shut-In 30 Minutes 2 nd opening 45 Minutes 2 nd Shut-In 90 Minutres Pressure vs. Time Pressure vs.	good blow back strong bloow see ga good blow back	as flow report Time (Min.) 0 1 50 1 50 1 50 1 15 47 48 90 -50 186 -50 -50 -50 -50 -50 -50 -50 -50	Pressure (psig) 1779.71 196.88 220.29 796.27 268.93 460.90 796.02 1690.69	Temp (deg F) 90.52 91.17 93.00 92.89 95.08 98.84 99.19	Anno Initial H Open T Shut-In End Sh Shut-In End Sh Final H	tation ydro-static To Flow (1) (1) ut-In(1) To Flow (2) (2) ut-In(2) ydro-static	Gas Rate (Mct/d
1770 1770	1st Shut-In 30 Minutes 2 nd opening 45 Minutes 2nd Shut-In 90 Minutres Pressure vs. Time Pressure vs.	good blow back strong bloow see ga good blow back	as flow report Time (Min.) 0 50 1 50 15 47 48 90 186 50 186 50 186 50 186 50 186 50 186	Pressure (psig) 1779.71 196.88 220.29 796.27 268.93 460.90 796.02 1690.69	Temp (deg F) 90.52 91.17 93.00 92.89 95.08 98.84 99.19 95.19 Gas Choke (in 0	Anno Initial H Open T Shut-In End Sh Open T Shut-In End Sh Final H Final H	tation ydro-static To Flow (1) (1) ut-In(1) To Flow (2) (2) ut-In(2) ydro-static	13.25
079 0 609 0 709 0 700 0 70	1st Shut-In 30 Minutes 2 nd opening 45 Minutes 2 nd Shut-In 90 Minutres Pressure vs. Time Pressure vs.	good blow back strong bloow see ga good blow back	as flow report Time (Min.) 0 1 50 1 50 1 50 1 15 47 48 90 -50 186 -50 -50 -50 -50 -50 -50 -50 -50	Pressure (psig) 1779.71 196.88 220.29 796.27 268.93 460.90 796.02 1690.69	Temp (deg F) 90.52 91.17 93.00 92.89 95.08 98.84 99.19 95.19 Gas Choke (in 0	Anno Initial H Open T Shut-In End Sh Open T Shut-In End Sh Final H	tation ydro-static To Flow (1) (1) ut-In(1) To Flow (2) (2) ut-In(2) ydro-static	

<u>-</u> 	iste Inde Ac		1801 B 80202	og Oll LLC Broadw ay Su Justin Cart	ite 200 Denver er	,Colorado	<b>16-22s-13w Staffor</b> <b>M&amp;N-Gates #1-16</b> Job Ticket: 01074 Test Start: 2019.01.23	DST#:3
Tool Informatio	on		+					
Drill Pipe: Heavy Wt. Pipe:	Length: Length:	3220.00 ft 310.00 ft			nches Volume: nches Volume:			2000.00 lb
Drill Collar:	Length:	0.00 ft	Diameter:		nches Volume:			
Drill Pipe Above P	KB:	28.00 ft			Total Volume:		-	0.00 ft
Depth to Top Pac Depth to Bottom I		3532.00 ft					Final	lb
		ft 20.00 ft						
Interval botw oon								
Interval between	Packers:							
Tool Length: Number of Packe		20.00 ft 50.00 ft 2	Diameter:	6.75 i	nches			
Tool Length: Number of Packe		50.00 ft	Diameter:	: 6.75 i	nches			
Interval betw een Tool Length: Number of Packe Tool Comments: <b>Tool Descriptic</b>	rs:	50.00 ft 2		6.75 i Serial No.	Position	Depth (ft)	Accum. Lengths	
Tool Length: Number of Packe Tool Comments: <b>Tool Descriptic</b>	rs:	50.00 ft 2				<b>Depth (ft)</b> 3507.00	Accum. Lengths	
Tool Length: Number of Packe Tool Comments: <b>Tool Descriptic</b> Shut In Tool	rs:	50.00 ft 2	ngth (ft)				Accum. Lengths	
Tool Length: Number of Packe Tool Comments: <b>Tool Descriptic</b> Shut In Tool Hydraulic tool	rs:	50.00 ft 2	ngth (ft) 5.00			3507.00	Accum. Lengths	
Tool Length: Number of Packe Tool Comments: <b>Tool Descriptic</b> Shut In Tool Hydraulic tool Jars	rs:	50.00 ft 2	ngth (ft) 5.00 5.00			3507.00 3512.00	Accum. Lengths	
Tool Length: Number of Packe Tool Comments: <b>Tool Descriptic</b> Shut In Tool Hydraulic tool Jars Safety Joint	rs:	50.00 ft 2	ngth (ft) 5.00 5.00 5.00			3507.00 3512.00 3517.00	Accum. Lengths	Bottom Of Top Packer
Tool Length: Number of Packe Tool Comments: <b>Tool Descriptic</b> Shut In Tool Hydraulic tool Jars Safety Joint Packer	rs:	50.00 ft 2	<b>ngth (ft)</b> 5.00 5.00 5.00 5.00			3507.00 3512.00 3517.00 3522.00		Bottom Of Top Packer
Tool Length: Number of Packe Tool Comments: <b>Tool Descriptic</b> Shut In Tool Hydraulic tool Jars Safety Joint Packer Packer	rs:	50.00 ft 2	<b>ngth (ft)</b> 5.00 5.00 5.00 5.00 5.00		Position	3507.00 3512.00 3517.00 3522.00 3527.00		Bottom Of Top Packer
Tool Length: Number of Packe Tool Comments: Tool Descriptic Shut In Tool Hydraulic tool Jars Safety Joint Packer Packer Anchor	rs:	50.00 ft 2	ngth (ft) 5.00 5.00 5.00 5.00 5.00 5.00		Position	3507.00 3512.00 3517.00 3522.00 3527.00 3532.00		Bottom Of Top Packer
Tool Length: Number of Packe Tool Comments: Tool Descriptic Shut In Tool Hydraulic tool Jars Safety Joint Packer Packer Anchor Recorder	rs:	50.00 ft 2	ngth (ft) 5.00 5.00 5.00 5.00 5.00 5.00 15.00	Serial No.	Position	3507.00 3512.00 3517.00 3522.00 3527.00 3532.00 3547.00		Bottom Of Top Packer
Tool Length: Number of Packe Tool Comments:	rs:	50.00 ft 2	ngth (ft) 5.00 5.00 5.00 5.00 5.00 5.00 15.00 0.00	Serial No. 9119	Position Fluid Inside	3507.00 3512.00 3517.00 3522.00 3527.00 3532.00 3532.00 3547.00	30.00	Bottom Of Top Packer

	DR DR	ILL STEM TEST REPOI	RT	FLU	JID SUMMAR
	Bird D	og Oll LLC	16-22s-13	w Stafford	
<u> 3lesten</u>	<b>5</b> 1801 E	Broadw ay Suite 200 Denver ,Colorado	M&N-Gat	es#1-16	
ama Bond Ban	80202		Job Ticket:	01074 DS	ST#:3
Grow Sund Carrie	ATTN:	Justin Carter	Test Start:	2019.01.23 @ 04:49	:00
lud and Cushion Inform	nation				
ud Type: Gel Chem		Cushion Type:		Oil API:	36 deg API
ud Weight: 9.00 lb/ga		Cushion Length:	ft	Water Salinity:	ppm
iscosity: 60.00 sec/c /ater Loss: 12.00 in <sup>3</sup>	qt	Cushion Volume:	bbl		
Vater Loss: 12.00 in <sup>3</sup> esistivity: ohm.	-	Gas Cushion Type: Gas Cushion Pressure:			
alinity: 13600.00 ppm		Gas Cushion Pressure:	psig		
Iter Cake: 1.00 inche					
ecovery Information					
	Length	Recovery Table Description	Volume	7	
	ft		bbl		
	<u>1900.00</u> 0.00	Clean Gassy Oil 30% Gas 70% Oil Gravity 36 Corrected	24.76		
Tatalla				<u>o</u>	
Total Le	uid Samples: 0	0.00 ft Total Volume: 24.767 b Num Gas Bombs: 0	Serial #		
	tory Name:	Laboratory Location:			
Recove	ery Comments:				
Recove	ery Comments:				
Recove	ery Comments:				
Recove	ery Comments:				
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Recove	ery Comments:				



## DRILL STEM TEST REPORT

### Bird Dog Oll LLC

1801 Broadw ay Suite 200 Denver ,Colorado 80202

### 16-22s-13w Stafford

### M&N-Gates #1-16

Job Ticket: 01074 DST#:3 Test Start: 2019.01.23 @ 04:49:00

GAS RATES

ATTN: Justin Carter

#### **Gas Rates Information**

Temperature: Relative Density: Z Factor: 59 (deg F) 0.65 0.8

#### Gas Rates Table

Flow Period	Elapsed Time	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)
2	5	0.13	21.00	13.25
2	15	0.13	21.00	13.25
2	25	0.13	1.00	5.76
2	35	0.13	1.00	5.76
2	45	0.13	1.00	5.76



04740

0-1-1 11

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# **DRILL STEM TESTING - DATA LISTING**

### Bird Dog Oll LLC

1801 Broadw ay Suite 200 Denver ,Colorado 80202

### 16-22s-13w Stafford

 M&N-Gates #1-16

 Job Ticket: 01074
 DST#:3

 Test Start: 2019.01.23 @ 04:49:00

ATTN: Justin Carter

# 91716 Outside	Serial # 9			91716 Outside	Serial #
Time Pressure	Comments	Temp.	Pressure	Time	comments
(Min.) (psig)		(deg F)	(psig)	(Min.)	
98.5 1580.14		42.7	11.86	4.5	
100.5 1560.73		41.5	10.51	8.5	
102.5 1605.33		38.8	9.77	12.5	
104.5 1669.02		37.1	9.37	16.5	
106.5 1726.33		51.1	27.58	20.5	
108.5 1710.94		57.8	29.07	24.5	
110.5 1707.05		59.7	29.84	28.5	
112.5 1704.48		60.4	29.90	32.5	
114.5 1703.14		60.8	30.14	36.5	
115.0 1769.88		61.0	30.20	40.5	
115.5 1746.62		61.0	30.20	44.5	
static 116.0 1747.99	nitial Hydro-static	63.9	85.20	48.5	
w(1) 116.5 229.63	Open To Flow (1)	68.3	171.40	52.5	
117.0 210.15		71.2	321.54	56.5	
117.5 193.92		74.0	480.15	60.5	
119.5 172.67		75.4	570.05	62.5	
121.5 176.26		76.2	595.93	64.5	
123.5 184.62		76.5	590.30	66.5	
125.5 193.89		77.0	692.45	68.5	
127.5 204.84		77.6	750.92	70.5	
129.5 214.99		78.0	811.10	72.5	
130.5 220.45		78.4	925.74	74.5	
131.0 223.45		78.9	965.33	76.5	
131.5 226.45	Shut-In(1)	79.4	996.68	78.5	
132.0 289.84		79.6	1058.24	80.5	
132.5 462.78		79.9	1097.09	82.5	
133.0 581.75		80.2	1149.67	84.5	
135.0 704.77		80.9	1175.15	86.5	
137.0 742.00		81.4	1218.02	88.5	
139.0 760.91		81.9	1298.05	90.5	
141.0 771.73		82.4	1361.70	92.5	
143.0 778.27		83.1	1418.01	94.5	
145.0 782.60		83.8	1495.23	96.5	

Printing every 4 samples

Eagle Testers

Serial # 9171				Serial #	91716	Outside		
Comments	Time	Pressure	Temp.	Comments		Time	Pressure	Temp
	(Min.)	(psig)	(deg F)			(Min.)	(psig)	(deg F
	147.0	785.74	96.0			212.0	732.81	99
	149.0	788.33	96.1			214.0	745.11	99
	151.0	790.41	96.3			216.0	753.34	99
	153.0	792.12	96.3			218.0	758.97	99.
	155.0	793.70	96.5			220.0	763.63	99.
	157.0	794.86	96.6			222.0	767.19	99.
	159.0	796.13	96.7			224.0	770.12	99.
	161.0	797.01	96.8			226.0	772.81	100.
	162.0	797.44	96.8			228.0	775.32	100.
	162.5	797.75	96.9			230.0	777.12	100.
End Shut-In(1)	163.0	797.85	96.9			232.0	778.94	100.
	163.5	297.92	96.9			234.0	780.53	100.
Open To Flow (2)	164.0	260.50	96.9			236.0	781.86	100.
	164.5	256.93	96.9			238.0	783.04	100.
	166.5	261.97	97.0			240.0	784.31	100.
	168.5	267.87	97.1			242.0	785.37	100.0
	170.5	283.70	97.2			244.0	786.33	100.
	172.5	296.32	97.3			246.0	787.35	100.4
	174.5	309.00	97.4			248.0	788.28	100.4
	176.5	320.24	97.5			250.0	788.85	100.9
	178.5	331.56	97.6			252.0	789.83	101.0
	180.5	342.87	97.7			254.0	790.58	101.1
	182.5	353.64	97.8			256.0	791.23	101.2
	184.5	364.68	97.9			258.0	791.91	101.2
	186.5	374.79	98.0			260.0	792.38	101.3
	188.5	385.58	98.1			262.0	793.08	101.4
	190.5	394.89	98.2			264.0	793.48	101.4
	192.5	404.96	98.3			266.0	793.87	101.5
	194.5	414.29	98.4			268.0	794.51	101.6
	196.5	423.52	98.5			270.0	795.03	101.6
	198.5	432.50	98.6			272.0	795.30	101.7
	200.5	441.38	98.7			274.0	795.74	101.8
	202.5	450.11	98.8			276.0	796.06	101.8
	204.5	458.40	98.9			278.0	796.50	101.9
	205.5	461.94	99.0			280.0	796.71	101.0
	206.0	464.36	99.0			282.0	797.12	102.0
Shut-In(2)	206.5	479.40	99.0	And the second sec		284.0	797.66	102.0
	207.0	607.19	99.0			286.0	797.78	102.1
	207.5	650.44	99.0			288.0	797.78	102.2
	208.0	671.51	99.1			290.0	798.43	102.2
	210.0	712.33	99.2			290.0	798.72	102.3

Eagle Testers

Serial # 91710	6 Outside			Serial #	91716	Outside		
Comments	Time	Pressure	Temp.	Comments		Time	Pressure	Temp.
	(Min.)	(psig)	(deg F)			(Min.)	(psig)	(deg F)
	294.0	798.82	102.4			367.0	1373.75	90.
	296.0	799.48	102.5			369.0	1381.39	90.
	298.0	799.54	102.5			371.0	1354.39	89.
	300.0	799.73	102.6			373.0	1326.57	88.
	300.5	799.83	102.6			375.0	1296.60	88.
	301.0	799.84	102.6			377.0	1266.35	87.
End Shut-In(2)	301.5	799.88	102.6			379.0	1238.68	87.
	302.0	1608.72	102.7			381.0	1199.07	86.
Final Hydro-static	302.5	1676.53	102.7			383.0	1199.67	86.0
	303.0	1696.86	102.6			385.0	1175.07	85.
	305.0	1682.01	102.5			387.0	1146.57	85.0
	307.0	1681.07	102.3			389.0	1114.64	84.4
	309.0	1680.28	102.1			391.0	1087.81	83.9
	311.0	1679.76	101.9			393.0	1060.12	83.3
	313.0	1679.55	101.8			395.0	1031.40	82.8
	315.0	1679.26	101.8			397.0	986.38	82.4
Construction Profiled With construction	317.0	1679.01	101.7			399.0	968.61	82.1
	319.0	1678.55	101.7			401.0	958.06	81.9
	321.0	1678.38	101.7			403.0	932.66	81.6
	323.0	1687.39	101.6			405.0	902.99	81.4
	325.0	1694.84	101.7			407.0	889.71	81.2
	327.0	1695.46	101.7			409.0	896.43	81.1
	329.0	1695.66	101.7			411.0	885.71	81.0
	331.0	1695.57	101.7			413.0	885.64	81.0
	333.0	1695.05	101.8			415.0	885.28	81.0
	335.0	1694.13	101.8			417.0	885.20	80.9
	337.0	1715.09	102.0			419.0	885.28	80.9
	339.0	1690.61	101.7			421.0	885.23	80.9
	341.0	1670.31	101.3			423.0	884.71	80.9
	343.0	1607.92	100.5			425.0	884.26	80.8
	345.0	1576.19	98.9			427.0	884.09	80.8
	347.0	1597.37	97.2			429.0	883.85	80.8
	349.0	1574.84	96.3			431.0	885.17	80.8
	351.0	1519.55	95.4			433.0	888.34	80.8
	353.0	1521.29	94.4			435.0	885.75	80.7
	355.0	1503.16	93.5			437.0	887.44	80.7
	357.0	1480.50	92.9			439.0	886.12	80.7
	359.0	1449.43	92.2			441.0	885.54	80.7
	361.0	1396.06	91.5			443.0	916.76	80.5
	363.0	1407.08	90.9			445.0	885.18	80.2
	365.0	1395.95	90.7			447.0	883.74	80.1

Eagle Testers

Serial # 917	16 Outside			Serial #	91716	Outside		
Comments	Time	Pressure	Temp.	Comments		Time	Pressure	Temp
	(Min.)	(psig)	(deg F)	P. 1. 1997		(Min.)	(psig)	(deg F
	449.0	883.33	80.0			531.0	535.67	73
	451.0	902.19	80.0			533.0	472.43	72
	453.0	888.85	80.0			535.0	419.89	70
	455.0	918.58	80.0			537.0	364.55	69
	457.0	919.30	80.0			539.0	292.46	68.
	459.0	915.82	80.0			541.0	230.29	67
	461.0	917.71	80.0			543.0	170.18	66
	463.0	919.02	80.0			545.0	102.39	66
	465.0	919.36	80.0			547.0	31.71	66
	467.0	919.35	80.0			549.0	42.09	65
i en	469.0	918.36	80.0			551.0	50.39	65
	471.0	916.75	80.0			553.0	54.76	64
	473.0	916.02	80.0			555.0	58.03	64
	475.0	915.79	80.0			557.0	60.29	64
	477.0	915.73	80.0			559.0	61.40	64.
	479.0	916.07	80.0			561.0	62.25	64.
	481.0	915.79	80.0			563.0	62.67	64
	483.0	913.44	80.0			565.0	22.56	64
	485.0	912.74	80.0			567.0	27.08	64.
	487.0	912.66	80.0			569.0	8.03	64.
	489.0	912.40	79.9			571.0	8.28	64.
	491.0	911.92	79.9		and the second	573.0	8.11	64.
	493.0	912.01	79.9			575.0	8.26	64.
	495.0	911.75	79.9			577.0	8.29	64.
	497.0	911.70	79.9			579.0	8.30	64.
	499.0	912.10	80.0			581.0	8.27	64.
	501.0	912.08	79.9			583.0	8.11	64.
	503.0	912.70	80.0			585.0	8.30	63.
	505.0	864.61	79.9			587.0	8.25	63.
	507.0	894.58	79.9			589.0	8.49	63.
	509.0	885.09	79.9			591.0	8.29	63.
	511.0	880.99	79.9			593.0	8.33	63.
	513.0	840.02	79.9			595.0	8.34	63.
	515.0	857.32	79.9			597.0	8.21	63.
	517.0	822.85	79.0			599.0	8.32	63.
	519.0	789.83	78.4			601.0	8.24	63.
	521.0	745.31	78.2			603.0	8.24	63.
	523.0	694.54	77.6			605.0	7.33	62.
	525.0	666.81	76.6			607.0	7.48	61.
	527.0	597.63	75.5			609.0	7.15	61.
	529.0	602.68	74.3			611.0	4.49	52.5

Eagle Testers

Serial #	91716	Outside			Serial #	9119	Inside		
Comments		Time	Pressure	Temp.	Comments		Time	Pressure	Temp.
		(Min.)	(psig)	(deg F)	Commente		(Min.)	(psig)	(deg F
		613.0	5.07	49.1			()	(poig)	(deg i
		614.5	5.19	48.7					
				1					



# **DRILL STEM TESTING - DATA LISTING**

### Bird Dog Oll LLC

1801 Broadw ay Suite 200 Denver ,Colorado 80202

### 16-22s-13w Stafford

 M&N-Gates #1-16

 Job Ticket: 01074
 DST#:3

ATTN: Justin Carter

Test Start: 2019.01.23 @ 04:49:00

Serial # 9119	Inside			Serial #	9119 Inside		
Comments	Time	Pressure	Temp.	Comments	Time	Pressure	Temp.
and the second	(Min.)	(psig)	(deg F)		(Min.)	(psig)	(deg F
	3.0	15.31	41.5		90.0	1329.45	80.
	7.0	15.32	36.7		92.0	1337.06	81.
	11.0	15.41	33.2		94.0	1397.73	82.
	15.0	15.41	31.1		96.0	1461.43	82.
	19.0	31.36	51.6		98.0	1525.05	83.
	23.0	31.89	57.9		100.0	1568.45	85.
	27.0	31.92	58.5		102.0	1583.50	86.
	31.0	31.95	58.4		104.0	1644.93	86.
	35.0	31.98	58.2		106.0	1704.44	87.
	39.0	31.99	58.0		108.0	1724.56	89.0
	43.0	32.06	57.8		110.0	1715.61	89.3
	46.0	62.18	57.6		112.0	1712.41	89.4
	48.0	90.00	64.0		114.0	1710.60	89.4
	50.0	119.68	67.2		115.5	1753.59	90.
	52.0	184.60	68.0		116.0	1750.54	90.4
	54.0	235.79	69.1	Initial Hydro-stati	ic 116.5	1779.71	90.5
	56.0	327.81	71.3		117.0	216.10	90.4
	58.0	406.30	72.8	Open To Flow (1)	) 117.5	196.88	90.5
	60.0	449.28	73.8		118.0	181.56	90.6
	62.0	542.52	74.7		120.0	167.46	90.7
	64.0	605.08	75.3		122.0	172.00	90.7
	66.0	596.97	75.4		124.0	180.59	90.8
	68.0	667.27	75.9		126.0	190.39	90.9
	70.0	724.79	76.4		128.0	201.07	91.0
	72.0	779.93	76.8		130.0	211.62	91.1
	74.0	857.85	77.2		130.5	214.35	91.1
	76.0	939.21	77.7		131.0	217.21	91.1
	78.0	972.27	78.2	Shut-In(1)	131.5	220.29	91.2
	80.0	1027.25	78.4		132.0	223.10	91.2
	82.0	1056.96	78.5		132.5	362.15	91.3
	84.0	1139.79	78.9		133.0	520.52	91.3
	86.0	1187.33	79.7		135.0	695.27	91.5
	88.0	1277.01	80.4		137.0	737.15	91.6

Printing every 4 samples

Eagle Testers

Serial # 9119	Inside			Serial #	9119	Inside		
Comments	Time	Pressure	Temp.	Comments		Time	Pressure	Temp.
	(Min.)	(psig)	(deg F)			(Min.)	(psig)	(deg F
	139.0	757.91	91.7			207.0	538.43	95.
	141.0	769.40	91.8			207.5	624.39	95.
	143.0	776.28	91.9			208.0	656.34	95.
	145.0	780.86	92.0			210.0	705.27	95.
	147.0	784.24	92.2			212.0	727.64	95.
	149.0	787.00	92.3			214.0	740.67	95.
	151.0	789.11	92.4			216.0	749.35	95.
	153.0	790.56	92.5			218.0	755.41	95.
	155.0	792.05	92.6			220.0	760.15	95.8
	157.0	793.35	92.7			222.0	763.77	95.9
	159.0	794.39	92.8			224.0	766.99	96.0
	161.0	795.43	92.9			226.0	769.68	96.
	162.0	796.03	92.9			228.0	772.04	96.2
	162.5	796.14	93.0			230.0	774.03	96.3
End Shut-In(1)	163.0	796.27	93.0			232.0	775.79	96.3
	163.5	424.55	92.9			234.0	777.25	96.4
Open To Flow (2)	164.0	268.93	92.9			236.0	778.67	96.5
	164.5	252.07	92.9			238.0	780.00	96.6
	166.5	255.84	93.0			240.0	781.09	96.7
	168.5	260.55	93.1			242.0	782.20	96.8
	170.5	276.65	93.2			244.0	783.16	96.8
	172.5	289.36	93.3			246.0	784.07	96.9
	174.5	302.29	93.4			248.0	784.93	97.0
	176.5	313.86	93.5			250.0	785.58	97.1
	178.5	325.05	93.6			252.0	786.44	97.1
	180.5	336.35	93.7			254.0	787.14	97.2
	182.5	347.33	93.8			256.0	787.75	97.3
	184.5	358.29	94.0			258.0	788.34	97.4
	186.5	368.48	94.1			260.0	788.94	97.4
	188.5	379.30	94.2			262.0	789.40	97.5
	190.5	389.08	94.3			264.0	789.95	97.6
	192.5	398.62	94.4			266.0	790.37	97.7
	194.5	408.47	94.5			268.0	790.93	97.7
	196.5	417.70	94.6			270.0	791.24	97.8
	198.5	426.63	94.7			272.0	791.73	97.9
	200.5	435.38	94.8			274.0	792.14	97.9
	202.5	444.27	94.9			276.0	792.41	98.0
	204.5	452.60	95.0			278.0	792.83	98.1
	205.5	456.48	95.0			280.0	793.18	98.1
	206.0	458.60	95.1			282.0	793.45	98.2
Shut-In(2)	206.5	460.90	95.1			284.0	793.72	98.3

Eagle Testers

Ref. No: 01074

Serial # 9119				Serial #	9119	Inside		
Comments	Time	Pressure	Temp.	Comments		Time	Pressure	Temp.
	(Min.)	(psig)	(deg F)			(Min.)	(psig)	(deg F
	286.0	794.05	98.3			359.5	1453.81	90.
	288.0	794.28	98.4			361.5	1437.57	89.
	290.0	794.59	98.5			363.5	1411.47	88.
	292.0	794.82	98.5			365.5	1401.38	88.
	294.0	795.13	98.6			367.5	1383.47	88.
	296.0	795.38	98.7			369.5	1353.65	88.
	298.0	795.81	98.7			371.5	1358.72	87.
	300.0	795.91	98.8			373.5	1331.21	86.
	301.0	795.97	98.8			375.5	1302.98	86.
	301.5	796.02	98.8			377.5	1272.87	85.
End Shut-In(2)	302.0	796.02	98.8			379.5	1243.48	84.
Final Hydro-static	302.5	1690.69	99.2			381.5	1201.99	84.
	303.0	1711.28	98.9			383.5	1204.98	84.0
	303.5	1696.44	99.3			385.5	1180.28	83.4
	305.5	1683.47	99.1			387.5	1153.08	82.
	307.5	1683.36	99.4			389.5	1121.75	82.0
	309.5	1682.70	99.7			391.5	1093.35	81.0
	311.5	1682.18	99.9			393.5	1065.77	81.
	313.5	1681.90	100.0			395.5	1036.24	80.9
	315.5	1681.71	100.1			397.5	986.14	80.7
	317.5	1681.46	100.3			399.5	979.59	80.0
	319.5	1680.97	100.3			401.5	963.46	79.7
	321.5	1680.85	100.4			403.5	937.79	79.6
	323.5	1689.18	100.5			405.5	908.21	79.3
	325.5	1696.83	100.6			407.5	895.30	79.3
	327.5	1697.98	100.7			409.5	904.31	79.3
	329.5	1697.73	100.8			411.5	891.37	79.3
	331.5	1697.60	100.9			413.5	891.55	79.3
	333.5	1697.01	101.0			415.5	891.43	79.3
	335.5	1699.11	101.1			417.5	891.21	79.3
	337.5	1714.85	101.5			419.5	891.30	79.3
	339.5	1694.97	100.3			421.5	891.06	79.3
	341.5	1672.66	99.9			423.5	890.71	79.2
	343.5	1607.39	98.5			425.5	890.18	79.2
	345.5	1586.42	96.1			427.5	890.02	79.2
	347.5	1599.97	94.4			429.5	890.36	79.2
	349.5	1578.43	93.5			431.5	889.21	79.2
	351.5	1545.29	92.9			433.5	893.83	79.2
	353.5	1494.20	92.2			435.5	891.60	79.2
	355.5	1506.78	91.6			435.5		
	357.5	1484.49	90.8			437.5	893.61 891.75	79.1 79.1

Eagle Testers

Serial # 9119	Inside			Serial #	9119	Inside		
Comments	Time	Pressure	Temp.	Comments		Time	Pressure	Temp
	(Min.)	(psig)	(deg F)			(Min.)	(psig)	(deg F
	441.5	891.51	79.1			523.5	702.91	72
	443.5	885.38	78.7			525.5	673.33	71.
	445.5	891.40	78.6			527.5	599.18	70.
	447.5	890.05	78.6			529.5	609.78	69.
	449.5	889.32	78.6			531.5	542.63	69.
	451.5	907.91	78.6			533.5	480.45	68.
	453.5	894.69	78.6			535.5	429.13	66.
	455.5	924.86	78.6			537.5	373.05	66.
	457.5	925.60	78.6			539.5	300.03	66.
	459.5	922.09	78.6			541.5	237.23	66.
	461.5	924.14	78.6			543.5	177.75	65.
	463.5	924.85	78.6			545.5	109.83	65.
	465.5	925.37	78.6			547.5	38.25	64.
	467.5	925.14	78.6			549.5	49.03	63.
	469.5	924.35	78.6			551.5	57.30	63.
	471.5	922.42	78.6			553.5	61.95	63.
	473.5	921.66	78.6			555.5	64.92	63.
	475.5	921.63	78.6			557.5	67.30	63.
	477.5	921.86	78.6			559.5	68.52	63.
	479.5	921.88	78.6			561.5	69.28	63.3
	481.5	921.53	78.6			563.5	69.59	63.3
	483.5	919.19	78.6			565.5	29.28	63.
	485.5	918.83	78.6			567.5	33.87	63.
	487.5	918.51	78.6			569.5	15.30	63.
	489.5	918.19	78.6			571.5	15.23	63.3
	491.5	917.85	78.6			573.5	15.27	63.
	493.5	917.73	78.6			575.5	15.24	63.
	495.5	917.81	78.6			577.5	15.23	63.
	497.5	917.47	78.6			579.5	15.24	63.1
	499.5	917.77	78.6			581.5	15.27	62.9
	501.5	918.00	78.6			583.5	15.23	62.8
	503.5	918.65	78.6	Construction of the second		585.5	15.15	62.8
	505.5	894.10	78.6			587.5	15.08	62.8
	507.5	899.83	78.6			589.5	15.05	62.7
	509.5	890.50	78.6			591.5	15.07	62.3
	511.5	886.40	78.6			593.5	15.11	62.3
	513.5	848.43	78.6			595.5	15.13	62.2
	515.5	844.19	78.6			597.5	15.14	62.1
	517.5	828.88	77.6			599.5	15.08	61.9
	519.5	795.84	78.2			601.5	14.99	
	521.5	730.05	75.3			603.5	14.99	61.8 61.4

Eagle Testers

Ref. No: 01074

Serial #	9119	Inside		
Comments		Time	Pressure	Temp.
		(Min.)	(psig)	(deg F)
		605.5	14.97	58.5
		607.5	14.99	54.7
		609.5	14.88	51.8
		611.5	15.24	42.0
		613.5	15.01	42.3
		615.0	14.94	43.2



### DRILL STEM TEST REPORT

Prepared For:

Bird Dog Oll LLC 1801 Broadway Suite 200 Denver ,Colorado 80202

ATTN: Justin Carter

M&N-Gates #1-16

### 16-22s-13w Stafford

 Start Date:
 2019.01.24 @ 04:36:00

 End Date:
 2019.01.24 @ 21:49:00

 Job Ticket #:
 01075
 DST #:
 4

Eagle Testers 1309 Patton Road Great Bend, Kansas 67530 620-791-7394

Printed: 2019.01.24 @ 22:05:18

	Bird Dog Oll LLC			16-22	2s-13w \$	Stafford	b	
ZTesters	1801 Broadw ay Suite 80202	e 200 Denver	,Colorado		-Gates		DST	
Grand Bands Kanne					icket: 010 Start: 201		@ 04:36:00	
	ATTN: Justin Carter	1		Tests	Start. 201	19.01.24	@ 04.00.00	
ENERAL INFORMATION:								
eviated: No Whipstock: me Tool Opened: 06:19:00 me Test Ended: 21:49:00	ft (KB)			Test Teste Unit N	er: G	iene Budi		Hole (Initial)
oterval: 3760.00 ft (KB) To 3 otal Depth: 3823.00 ft (KB) (T ole Diameter: 7.88 inchesHo				Refer	rence Elev KB to	vations:	1901.	00 ft (KB) 00 ft (CF) 00 ft
Gerial #: 91716         Outside           ress@RunDepth:         479.49 psig           tart Date:         2019.01.24           tart Time:         16:19:00	End Date:		2019.01.24 21:31:29	Capacity: Last Calib Time On B Time Off E	Stm: 2		5000. 2019.01. 4 @ 18:02: 4 @ 19:50:	00
dat Chut In C								
2nd Opening 3 2nd Shut-In 3	30 Minutes 30 Minutes no blow for 1 30 Minutes	10 minutes we	eak blow for			E SUM	MARY	
2nd Opening	30 Minutes no blow for 1 30 Minutes Time 9770 Torposter 9770 Torpo	10 minutes we	Time (Min.) 0 1 15 45 45 45 71 107 108		ESSUR (deg F) 99.77 100.52 103.00 104.33 104.35 105.46 107.40	Annota Initial Hy Open To Shut-In( End Shu Open To Shut-In( End Shu	ation dro-static b Flow (1) 1) 1:-In(1) b Flow (2) 2)	
2nd Opening 3 2nd Shut-In 3	30 Minutes no blow for 1 30 Minutes Time 9770 Toppatre 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	190 100 100 100 100 100 100 100 100 100	Time (Min.) 0 1 15 45 45 45 71 107	Pressure (psig) 1922.17 73.96 74.78 883.54 91.54 92.97 479.49	ESSUR Temp (deg F) 99.77 100.52 103.00 104.33 104.35 105.46 107.40 107.46	Annota Initial Hy Open To Shut-In( End Shu Ghut-In( End Shu Final Hy	ation dro-static p Flow (1) 1) ut-In(1) p Flow (2) 2) ut-In(2) rdro-static	
2nd Opening 3 2nd Shut-In 3	30 Minutes no blow for 1 30 Minutes Time 9770 Toppatre 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Time (Min.) 0 1 15 45 45 45 71 107	Pressure (psig) 1922.17 73.96 74.78 883.54 91.54 92.97 479.49	ESSUR Temp (deg F) 99.77 100.52 103.00 104.33 104.35 105.46 107.40 107.46	Annota Initial Hy Open To Shut-In( End Shu Ghut-In( End Shu Final Hy	ation dro-static o Flow (1) 1) ut-ln(1) o Flow (2) 2) ut-ln(2) dro-static	Gas Rate (Mct
2nd Opening 3 2nd Shut-In 3	30 Minutes no blow for 1 30 Minutes Time 9770 Topposter 9770 Toppos	1000 1000	Time (Min.) 0 1 15 45 45 45 71 107	Pressure (psig) 1922.17 73.96 74.78 883.54 91.54 92.97 479.49	ESSUR Temp (deg F) 99.77 100.52 103.00 104.33 104.35 105.46 107.40 107.46	Annota Initial Hy Open To Shut-In( End Shu Ghut-In( End Shu Final Hy	ation dro-static p Flow (1) 1) ut-In(1) p Flow (2) 2) ut-In(2) rdro-static	Gas Rate (Mcf

	Bird Dog Oll LL	С		16-22	2s-13w \$	Stafford		
Tester	1801 Broadw a 80202	y Suite 200 Denve	r,Colorado		I-Gates		DST#:4	
Grad Sand Kana	ATTN: Justin	Carter				19.01.24 @ 0		
ENERAL INFORMATION: armation: Arbuckle								/1 ··· · B
eviated: No Whips me Tool Opened: 06:19:00 me Test Ended: 21:49:00	stock: ft (K	(B)		Test Teste Unit N	er: G	Conventional E Gene Budig	Bottom Hole	(Initial)
otal Depth: 3823.00 ft (	To 3823.00 ft (KB) (TV (KB) (TVD) thesHole Condition: Fair			Refer	rence Bev KB to	vations: o GR/CF:	1909.00 1901.00 8.00	ft (CF)
tart Date: 2019	0 psig @ 3817.78 f 0.01.24 End Date 5:19:00 End Time	):	2019.01.24 21:32:00	Capacity: Last Calib. Time On B Time Off E	Stm: 2	20 2019.01.24 @ 2019.01.24 @		psig
EST COMMENT: 1st Oper 1st Shut	-In 30 Minutes							
1st Shut 2nd Ope 2nd Shu	-In 30 Minutes ening 30 Minutes no blov t-In 30 Minutes		eak blow for				ARY	
1st Shut 2nd Ope 2nd Shu	-In 30 Minutes pring 30 Minutes no blov t-In 30 Minutes essure vs. Time 999 Temperature 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Time (Min.) 0 1 16 45 46 76		Temp (deg F) 100.18 100.33 101.13 102.09 101.89 103.11 104.72	E SUMMA Annotation Initial Hydro- Open To Flo Shut-In(1) End Shut-In(2) End Shut-In(2) End Shut-In(2) Final Hydro-	n-static bw (1) (1) bw (2) (2)	
1st Shut 2nd Ope 2nd Shu 900 900 900 900 900 900 900 900 900 90	-In 30 Minutes ning 30 Minutes no blov t-In 30 Minutes control of the second	v for 10 minutes w	Time (Min.) 0 1 16 45 46 76 108	Pressure (psig) 1927.39 62.74 64.30 879.06 74.83 95.40 486.90	ESSUR Temp (deg F) 100.18 100.33 101.13 102.09 103.11 104.72 105.18 Ga	Annotation Initial Hydro- Open To Flo Shut-In(1) End Shut-In(2) End Shut-In(2) End Shut-In(2) Final Hydro-	-static ow (1) (1) (2) -static	
1st Shut 2nd Ope 2nd Shu 900 900 900 900 900 900 900 900 900 90	-In 30 Minutes pring 30 Minutes no blov t-In 30 Minutes control of the second secon	v for 10 minutes w	Time (Min.) 0 1 16 45 46 76 108	Pressure (psig) 1927.39 62.74 64.30 879.06 74.83 95.40 486.90	ESSUR Temp (deg F) 100.18 100.33 101.13 102.09 101.89 103.11 104.72 105.18	Annotation Initial Hydro- Open To Flo Shut-In(1) End Shut-In(2) End Shut-In(2) End Shut-In(2) Final Hydro-	-static ow (1) (1) (2) -static	as Rate (Mc
1st Shut 2nd Ope 2nd Shu 99797/hosur 779 600 779 600 779 600 779 600 779 600 779 600 779 600 779 600 779 600 779 600 779 600 779 600 779 600 779 779 779 779 779 779 779 779 779 7	-In 30 Minutes pring 30 Minutes no blov t-In 30 Minutes essure vs. Time 999 Temperature 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	w for 10 minutes w	Time (Min.) 0 1 16 45 46 76 108	Pressure (psig) 1927.39 62.74 64.30 879.06 74.83 95.40 486.90	ESSUR Temp (deg F) 100.18 100.33 101.13 102.09 103.11 104.72 105.18 Ga	Annotation Initial Hydro- Open To Flo Shut-In(1) End Shut-In(2) End Shut-In(2) End Shut-In(2) Final Hydro-	-static ow (1) (1) (2) -static	as Rate (Mc

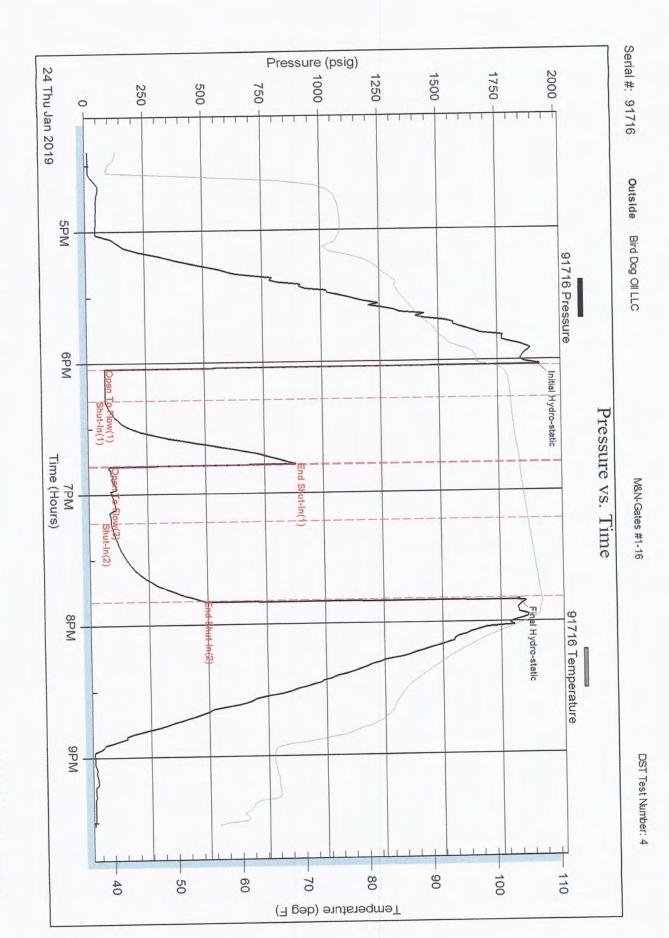
0.00 ft 0.00 ft 0.00 ft 0.00 ft ft	80202	adw ay Suite Justin Carter 3.80 inc 2.86 inc 0.00 inc	200 Denver , thes Volume: thes Volume: thes Volume:	48.24 bbl 2.46 bbl	16-22s-13w Stafford M&N-Gates #1-16 Job Ticket: 01075 Test Start: 2019.01.24 @ Tool Weight: Weight set on Packer:	2000.00 lb
0.00 ft 0.00 ft 0.00 ft 0.00 ft ft	80202 ATTN: J Diameter: Diameter:	ustin Carter 3.80 inc 2.86 inc 0.00 inc	thes Volume:	48.24 bbl 2.46 bbl	Job Ticket: 01075 Test Start: 2019.01.24 @ Tool Weight: Weight set on Packer:	04:36:00 2000.00 lb
0.00 ft 0.00 ft 0.00 ft 0.00 ft ft	ATTN: J Diameter: Diameter:	3.80 inc 2.86 inc 0.00 inc	hes Volume:	2.46 bbl	Test Start: 2019.01.24 @ Tool Weight: Weight set on Packer:	04:36:00 2000.00 lb
0.00 ft 0.00 ft 0.00 ft 0.00 ft ft	Diameter: Diameter:	3.80 inc 2.86 inc 0.00 inc	hes Volume:	2.46 bbl	Tool Weight: Weight set on Packer:	2000.00 lb
0.00 ft 0.00 ft 0.00 ft 0.00 ft ft	Diameter:	2.86 inc 0.00 inc	hes Volume:	2.46 bbl	Weight set on Packer:	
0.00 ft 0.00 ft 0.00 ft 0.00 ft ft	Diameter:	2.86 inc 0.00 inc	hes Volume:	2.46 bbl	Weight set on Packer:	
0.00 ft 9.00 ft 0.00 ft ft		0.00 inc				20000.00 lb
9.00 ft 0.00 ft ft	Diameter:		thes Volume:		MILLER Dull concer	70000 00 lb
0.00 ft ft				0.00 bbl	Weight to Pull Loose: Tool Chased	0.00 ft
0.00 ft ft			Total Volume:	50.70 bbl	String Weight: Initial	58000.00 lb
					Final	58000.00 lb
2.78 ft						
2.78 ft						
2	Diameter:	6.75 inc	ches			
Lei	ngth (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths	
	5.00			3735.00		
	5.00			3740.00		
				3745.00		
				3750.00		
				3755.00	30.00	Bottom Of Top Packe
			Fluid	3760.00		
			Inside			
			a loide			
		0110	haida			
		91/16	Outside		62.78 B	ottom Packers & Ancho
				3022.70	02.00	
	2	2 Diameter: Length (ft) 5 5.00 5.00 5.00 5.00 5.00 5.00 0.75 31.28 0.75 20.00 0.00 0.00 0.00 5.00	2         Diameter:         6.75 inc           Length (ft)         Serial No.           5.00         5.00           5.00         5.00           5.00         5.00           5.00         5.00           5.00         5.00           5.00         5.00           5.00         5.00           5.00         5.00           5.00         5.00           5.00         5.00           5.00         5.00           0.75         31.28           0.75         20.00           0.00         9119           0.00         91716           5.00         5.00	2         Diameter:         6.75 inches           Length (ft)         Serial No.         Position           5.00         Position         Position           5.00         Fluid         5.00           5.00         Fluid         Fluid           5.00         Fluid         5.00           5.00         Fluid         5.00           5.00         Fluid         5.00           5.00         Fluid         5.00           5.00         Inside         20.00           0.00         9119         Inside           0.00         91716         Outside           5.00         Fluid         5.00	2         Diameter:         6.75 inches           Length (t)         Serial No.         Position         Depth (t)           5.00         90sition         3735.00           5.00         3745.00         3745.00           5.00         100         3755.00           5.00         100         3755.00           5.00         100         3755.00           5.00         100         3765.00           5.00         100         3765.00           5.00         100         3765.00           5.00         100         3765.00           5.00         100         3797.03           0.05         100         3797.78           0.00         9119         Inside         3817.78           0.00         91716         Outside         3817.78           0.00         91716         Outside         3817.78	2         Diameter:         6.75 inches           Length (ft)         Serial No.         Position         Depth (ft)         Accum. Lengths           5.00         3735.00         3735.00         3740.00           5.00         3745.00         3745.00           5.00         3745.00         3755.00           5.00         3755.00         30.00           5.00         3755.00         30.00           5.00         Fluid         3765.00           5.00         Fluid         3797.03           0.05         Inside         3797.78           20.00         9119         Inside         3817.78           0.00         91716         Outside         3817.78           0.00         91716         Outside         3817.78           5.00         S01716         S2.78

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Total Leng Num Fluid Laboratory	Length ft 1801 B 80202 ATTN: on	aroadw ay Suite 200 Denver ,Colorado Justin Carter Cushion Type: Cushion Length: Cushion Volume: Gas Cushion Type: Gas Cushion Pressure: Recovery Table Description oil cut mud 30% Oil 70% Mud Clean oil betw een the tools 0.00 ft Total Volume: 0.07 Num Gas Bombs: 0 Laboratory Location:	Oil	¢1-16	
lud Type: Gel Chem lud Weight: 9.00 lb/gal iscosity: 55.00 sec/qt /ater Loss: 9.99 in <sup>3</sup> lesistivity: ohm.m ialinity: 11200.00 ppm ilter Cake: 0.00 inches Recovery Information	80202 ATTN: on Length ft 10.00 0.00 th: 10 Samples: 0 / Name:	Justin Carter Cushion Type: Cushion Length: Cushion Volume: Gas Cushion Type: Gas Cushion Pressure: Recovery Table Description oil cut mud 30% Oil 70% Mud Clean oil betw een the tools 0.00 ft Total Volume: 0.07 Num Gas Bombs: 0	Job Ticket: 0107 Test Start: 2019 Oil ft Wa bbl psig Volume bbl 0.079 0.000	75 DST: 9.01.24 @ 04:36:00	) deg API
lud Type: Gel Chem lud Weight: 9.00 lb/gal iscosity: 55.00 sec/qt /ater Loss: 9.99 in <sup>3</sup> esistivity: ohm.m alinity: 11200.00 ppm ilter Cake: 0.00 inches Recovery Information	ATTN: on Length ft 10.00 0.00 th: 10 Samples: 0 / Name:	Cushion Type: Cushion Length: Cushion Volume: Gas Cushion Type: Gas Cushion Pressure: Recovery Table Description oil cut mud 30% Oil 70% Mud Clean oil betw een the tools 0.00 ft Total Volume: 0.07 Num Gas Bombs: 0	Test Start: 2019 Oil ft Wa bbl psig Volume bbl 0.079 0.000	9.01.24 @ 04:36:00	) deg API
ud Type: Gel Chem ud Weight: 9.00 lb/gal iscosity: 55.00 sec/qt later Loss: 9.99 in <sup>3</sup> esistivity: ohm.m alinity: 11200.00 ppm Iter Cake: 0.00 inches ecovery Information	Length ft 10.00 0.00 th: 10 Samples: 0 / Name:	Cushion Type: Cushion Length: Cushion Volume: Gas Cushion Type: Gas Cushion Pressure: Recovery Table Description oil cut mud 30% Oil 70% Mud Clean oil betw een the tools 0.00 ft Total Volume: 0.07 Num Gas Bombs: 0	Oil ft Wa bbl psig Volume bbl 0.079 0.000	I A PI:	deg API
ud Type: Gel Chem ud Weight: 9.00 lb/gal iscosity: 55.00 sec/qt later Loss: 9.99 in <sup>3</sup> esistivity: ohm.m alinity: 11200.00 ppm Iter Cake: 0.00 inches ecovery Information	Length ft 10.00 0.00 th: 10 Samples: 0 y Name:	Cushion Length: Cushion Volume: Gas Cushion Type: Gas Cushion Pressure: Recovery Table Description oil cut mud 30% Oil 70% Mud Clean oil betw een the tools 0.00 ft Total Volume: 0.07 Num Gas Bombs: 0	ft Wabbl psig Volume bbl 0.079 0.000		
Id Weight: 9.00 lb/gal scosity: 55.00 sec/qt ater Loss: 9.99 in <sup>3</sup> esistivity: ohm.m alinity: 11200.00 ppm ter Cake: 0.00 inches ecovery Information	ft 10.00 0.00 th: 10 Samples: 0 / Name:	Cushion Length: Cushion Volume: Gas Cushion Type: Gas Cushion Pressure: Recovery Table Description oil cut mud 30% Oil 70% Mud Clean oil betw een the tools 0.00 ft Total Volume: 0.07 Num Gas Bombs: 0	ft Wabbl psig Volume bbl 0.079 0.000		
scosity: 55.00 sec/qt ater Loss: 9.99 in <sup>3</sup> esistivity: ohm.m linity: 11200.00 ppm ter Cake: 0.00 inches ecovery Information	ft 10.00 0.00 th: 10 Samples: 0 / Name:	Cushion Volume: Gas Cushion Type: Gas Cushion Pressure: Recovery Table Description oil cut mud 30% Oil 70% Mud Clean oil betw een the tools 0.00 ft Total Volume: 0.07 Num Gas Bombs: 0	bbl psig Volume bbl 0.079 0.000		
ater Loss: 9.99 in <sup>3</sup> sistivity: ohm.m linity: 11200.00 ppm er Cake: 0.00 inches covery Information	ft 10.00 0.00 th: 10 Samples: 0 / Name:	Gas Cushion Pressure: Recovery Table Description oil cut mud 30% Oil 70% Mud Clean oil betw een the tools 0.00 ft Total Volume: 0.07 Num Gas Bombs: 0	Volume bbl 0.079 0.000 79 bbl		
sistivity: ohm.m linity: 11200.00 ppm eer Cake: 0.00 inches ecovery Information	ft 10.00 0.00 th: 10 Samples: 0 / Name:	Recovery Table         Description         oil cut mud 30% Oil 70% Mud         Clean oil betw een the tools         0.00 ft       Total Volume:       0.07         Num Gas Bombs:       0	Volume bbl 0.079 0.000 79 bbl		
ecovery Information	ft 10.00 0.00 th: 10 Samples: 0 / Name:	Description oil cut mud 30% Oil 70% Mud Clean oil betw een the tools 0.00 ft Total Volume: 0.0 Num Gas Bombs: 0	bbl 0.079 0.000 79 bbl		
Total Leng Num Fluid Laboratory	ft 10.00 0.00 th: 10 Samples: 0 / Name:	Description oil cut mud 30% Oil 70% Mud Clean oil betw een the tools 0.00 ft Total Volume: 0.0 Num Gas Bombs: 0	bbl 0.079 0.000 79 bbl		
Total Leng Num Fluid Laboratory	ft 10.00 0.00 th: 10 Samples: 0 / Name:	oil cut mud 30% Oil 70% Mud Clean oil betw een the tools 0.00 ft Total Volume: 0.0 Num Gas Bombs: 0	bbl 0.079 0.000 79 bbl		
Num Fluid Laboratory	0.00 th: 10 Samples: 0 y Name:	Clean oil betw een the tools 0.00 ft Total Volume: 0.0 Num Gas Bombs: 0	0.000 79 bbl		
Num Fluid Laboratory	th: 10 Samples: 0 / Name:	0.00 ft Total Volume: 0.0 Num Gas Bombs: 0	79 bbl		
Num Fluid Laboratory	Samples: 0 / Name:	Num Gas Bombs: 0			
Laboratory	Name:		Senar#.		
		Laboratory Location.			

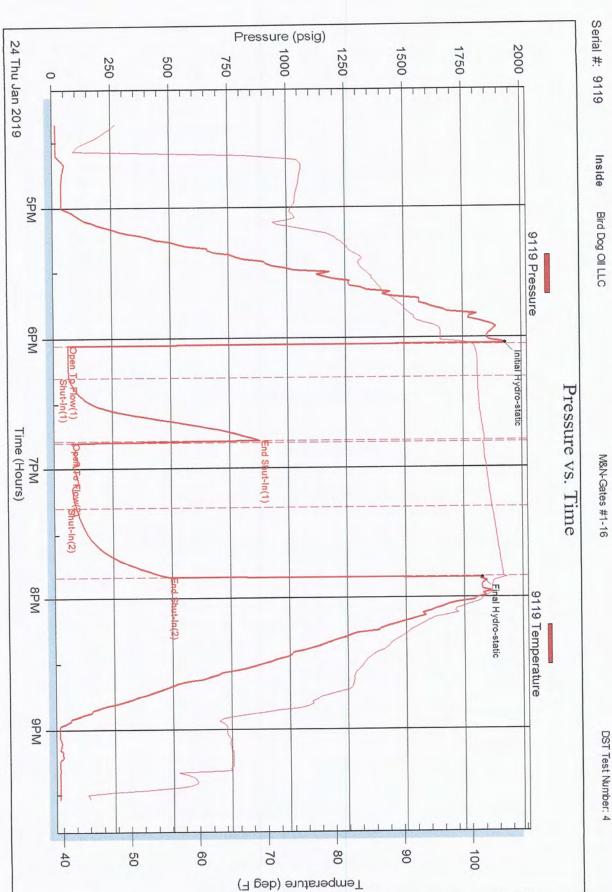
Ref. No: 01075

Printed: 2019.01.24 @ 22:05:19



Ref. No: 01075

Printed: 2019.01.24 @ 22:05:19





## DRILL STEM TEST REPORT

Prepared For:

Bird Dog Oll LLC

1801 Broadway Suite 200 Denver ,Colorado 80202

ATTN: Justin Carter

### M&N-Gates #1-16

### 16-22s-13w Stafford

 Start Date:
 2019.01.25 @ 04:19:00

 End Date:
 2019.01.25 @ 11:19:00

 Job Ticket #:
 01076
 DST #: 5

Eagle Testers 1309 Patton Road Great Bend, Kansas 67530 620-791-7394

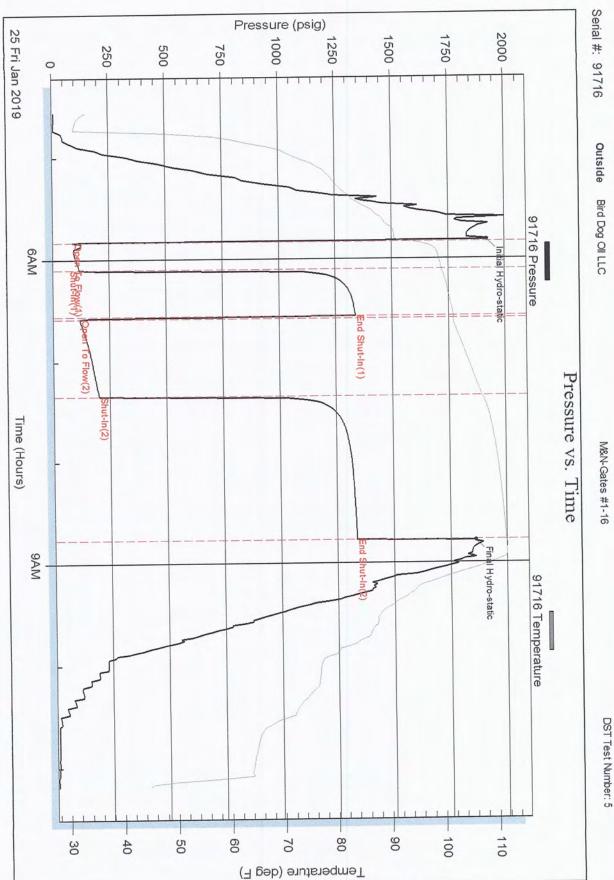
	Bird Dog Oll LLC		16-2	2s-13w	Stafford	
Testers	1801 Broadw ay Suite 200 80202	Denver ,Colorado		I-Gates		
Como Bond Romas	80202			ïcket: 010		ST#:5
grow grow o canno	ATTN: Justin Carter		Test	Start: 201	19.01.25 @ 04:19	:00
ENERAL INFORMATION:						
ormation: Arbuckle eviated: No Whipstock: me Tool Opened: 05:50:00 me Test Ended: 11:19:00	ft (KB)		Test Teste Unit M	er: G	conventional Botto Gene Budig	om Hole (Initial)
terval:3823.00 ft (KB) To38otal Depth:3828.00 ft (KB) (TVole Diameter:7.88 inchesHole			Refe	rence Elev KB to		09.00 ft (KB) 01.00 ft (CF) 8.00 ft
erial #: 91716         Outside           ress@RunDepth:         1336.48 psig           tart Date:         2019.01.25           tart Time:         04:19:00	@ 3823.00 ft (KB) End Date: End Time:	2019.01.25 11:11:59	Capacity: Last Calib Time On E Time Off E	.: Btm: 2	50 2019. 019.01.25 @ 05: 019.01.25 @ 08:	49:00
Pressure vs. 7					E SUMMARY	P
97700 Pressure vs. 7 97700 Pressure 17700	Time 9070 Torpetilan radiese state	Time (Min.) 	Pressure (psig) 1920.18 89.82	Temp (deg F) 92.20 94.41	Annotation Initial Hydro-stat Open To Flow (1	ic
		17 45 7 7 8 7 8 7 8 7 8 7 8 92	117.01 1338.22 118.74 201.10	107.36	Open To Flow (2 Shut-In(2)	?)
520	112			111.66	End Shut-In(2)	
500 780 220 220 220 20 20 20 20 20 20 20 20 20		32 177 177 177 177 177 177	1336.48 1859.95		End Snut-In(2) Final Hydro-stat	ic
500 70 500 500 500 500 500 500 500 500 5		177 	1336.48	111.67	Final Hydro-stat	ic
500 700 200 300 300 300 300 300 300 300 300 3	a ,	177 	1336.48	111.67	Final Hydro-stat	
1900 1900	volume (bbl)	177 	1336.48	111.67 Ga	Final Hydro-stat	
1900 780 790 790 790 790 790 790 790 790 790 79	Volume (bbl) Gas 80 %Oil 3.84	177 	1336.48	111.67 Ga	Final Hydro-stat	

		Bird Dog Oll LLC			16-2	2s-13w	Stafford		
	atera		000 D	alarada		V-Gates			
		1801 Broadw ay Suite 80202	200 Denver ,C	olorado		Ficket: 010		DST#:	5
gmass	WAS KEAREDS	ATTN: Justin Carter					19.01.25 @		
ENERAL INFO	ORMATION:								
ormation: eviated: me Tool Opened: me Test Ended:		ft (KB)			Test Test Unit I	er: C	Gene Budig	al Bottom Ho	ole (Initial)
nterval: 38 otal Depth: ole Diameter:	823.00 ft (KB) To 38 3828.00 ft (KB) (TV 7.88 inchesHole				Refe	erence Eler KB to	vations: o GR/CF:	1909.00 1901.00 8.00	
erial #: 9119 ress@RunDepth tart Date: tart Time: EST COMME	: 1326.37 psig 2019.01.25 04:19:00 NT: 1st Opening 1	<ul> <li>3823.00 ft (KB)</li> <li>End Date:</li> <li>End Time:</li> <li>5 Minutes fair blow built t</li> <li>0 Minutes 1/2 inch blow b</li> </ul>	1 o the bottom o	9.01.25 1:12:30 f a 5 gallo	Capacity: Last Calib Time On E Time Off I	o.: 3tm: 2 Btm: 2	2019.01.25	5000.00 2019.01.25 @ 05:49:00 @ 08:46:30	5
	2nd Opening 4	5 Minutes fair blow built t 0 Minutes 1/2 inch blow b	o the bottom o	f a 5 gallo	on bucket in1	7 minutes			
	Pressure vs.	Time			PF	RESSUR	RE SUMM	IARY	
	Pressure vs. *		110 100 100 100 100 100 100 100 100 100	Time (Min.) 0 2 18 45 45 92 177 178	Pressure (psig) 1924.45 100.38 107.77 1336.07 150.97 208.08 1326.37 1857.66	Temp (deg F) 90.99 99.69 108.69 106.87 106.23 114.67	Annotati Initial Hydr Open To R Shut-In(1) End Shut- Open To R Shut-In(2) End Shut-	ion ro-static Flow (1) ) In(1) Flow (2) ) In(2)	
2000 1770 1500			113 133 50 50 70 70 70 70 70 70 70 70 70 70 70 70 70	(Min.) 0 2 18 45 45 92 177	Pressure (psig) 1924.45 100.38 107.77 1336.07 150.97 208.08 1326.37	Temp (deg F) 90.99 99.69 108.69 106.87 106.23 114.67 112.01 112.19	Annotati Initial Hydr Open To F Shut-In(1) End Shut- Open To F Shut-In(2) End Shut-	ion ro-static Flow (1) ) In(1) Flow (2) ) In(2) ro-static	
	Interpland		113 503 503 70 70 70 70 70 70 70 70 70 70 70 70 70	(Min.) 0 2 18 45 45 92 177	Pressure (psig) 1924.45 100.38 107.77 1336.07 150.97 208.08 1326.37	Temp (deg F) 90.99 99.69 108.69 106.87 106.23 114.67 112.01 112.19	Annotati Initial Hydr Open To F Shut-In(1) End Shut- Gpen To F Shut-In(2) End Shut- Final Hydr	ion ro-static Flow (1) ) In(1) Flow (2) ) In(2) ro-static	Gas Rate (Mcf
2000 1709 1900	Description Clean Gassy Oil 290% (	Volume (I	113 503 503 70 70 70 70 70 70 70 70 70 70 70 70 70	(Min.) 0 2 18 45 45 92 177	Pressure (psig) 1924.45 100.38 107.77 1336.07 150.97 208.08 1326.37	Temp (deg F) 90.99 99.69 108.69 106.87 106.23 114.67 112.01 112.19	Annotati Initial Hydr Open To F Shut-In(1) End Shut- Gpen To F Shut-In(2) End Shut- Final Hydr	ion ro-static Flow (1) ) In(1) Flow (2) ) In(2) ro-static	Gas Rate (Mcf

Bird Dog Oil LLC         16-22e-13w Stafford           1801 Broadw ay Suite 200 Denver , Colorado 80202         M&N-Gates #1-16 Job Ticket: 01076         DST#:5 Test Start: 2019.01.25 @ 04:19:00           Tool Information Drill Pipe:         Length: 3501.00 ft Jameter:         Diameter:         3.80 inches Volume:         49.11 bbl           Drill Pipe:         Length:         310.00 ft Jameter:         Diameter:         2.29 bbl         Weight set on Packer:         2000.00 lb           Drill Pipe         Length:         0.00 ft         Diameter:         0.00 inches Volume:         2.29 bbl         Weight set on Packer:         2000.00 lb           Drill Pipe Above KB:         18.00 ft         Diameter:         0.00 inches Volume:         51.40 bbl         Tool Weight:         Storia Weight:         Nitial         58000.00 lb           Drill Pipe Above KB:         18.00 ft         Total Volume:         51.40 bbl         String Weight:         String Weight:         String Weight:         Initial 58000.00 lb           Depth to Bottom Packers:         2         Diameter:         6.75 inches         String Weight:	T Engla	Pa	DRIL	LSIE	VIESI	REPOR	11	TOOL DIAGRA
Model         Model <th< th=""><th></th><th>1.5</th><th>Bird Dog</th><th>OII LLC</th><th></th><th></th><th>16-22s-13w Stafford</th><th></th></th<>		1.5	Bird Dog	OII LLC			16-22s-13w Stafford	
B0202         Job Ticket: 01076         DST#:5           ATTN:         Justin Carter         Test Start: 2019.01.25 @ 04:19:00           Tool Information         Drill Fipe:         Length:         3501.00 ft         Diameter:         3.80 inches Volume:         49.11 bbi         Tool Weight:         2000.00 lb           Pill Collar:         Length:         310.00 ft         Diameter:         2.76 inches Volume:         0.00 bbi         Weight set on Packer: 2000.00 lb           Drill Fipe Above KB:         18.00 ft         Diameter:         0.00 inches Volume:         0.00 bbi         Weight set on Packer: 2000.00 lb           Dill Fipe Above KB:         18.00 ft         Total Volume:         51.40 bbi         String Weight: Initial 58000.00 lb           Depth to Top Packer:         3823.00 ft         Total Volume:         51.40 bbi         Final 58000.00 lb           Depth to Bottom Packers:         2         Diameter:         6.75 inches         Final 58000.00 lb           Tool Length         5.00 t         30808.00         3798.00         Jass         5.00           Satety Joint         5.00         3818.00         30.00         Bottom Of Top Packer           Satety Joint         5.00         Sate3.00         Recorder         0.00         9119         Inside 3823.00         Recor	<u>Slester</u>	5	1801 Bro	adw av Suite	200 Denver	,Colorado	M&N-Gates #1-16	
Fool Information         Drill Ripe:       Length:       3501.00 ft       Diameter:       3.80 inches Volume:       49.11 bbl       Tool Weight:       2000.00 lb         Heavy Wt. Pipe:       Length:       310.00 ft       Diameter:       2.76 inches Volume:       2.29 bbl       Weight set on Packer: 2000.00 lb         Drill Collar:       Length:       0.00 ft       Diameter:       0.00 inches Volume:       0.00 bbl       Weight set on Packer: 2000.00 lb         Drill Pipe Above KB:       18.00 ft       Diameter:       0.00 inches Volume:       51.40 bbl       Tool Chased       0.00 ft         Speth to Bottom Packer:       ft       Total Volume:       51.40 bbl       String Weight: Initial       58000.00 lb         Popth to Bottom Packer:       ft       It       Total Volume:       51.40 bbl       String Weight: Initial       58000.00 lb         Popth to Bottom Packer:       35.00 ft       It       String Weight Initial       58000.00 lb       Final       58000.00 lb         Yumber of Packers:       2       Diameter:       6.75 inches       String Weight Initial       58000.00 lb         Shut In Tool       5.00       3796.00       3796.00       3803.00       String Weight Initial       String Weight Initial       String Weight Initial       String Weight Initial				aon ay com			Job Ticket: 01076	DST#:5
Drill Fipe: Heavy Wt. Pipe: Length:Length: 310.00 ftDiameter: Diameter:3.80 inches Volume: 2.76 inches Volume:49.11 bbl 2.29 bblTool Weight: Weight set on Packer: 2.29 bbl2000.00 lb Weight set on Packer: 2.29 bblDrill Collar: Length:Length: 0.00 ftDiameter: Diameter:0.00 inches Volume: Total Volume:0.00 bblWeight set on Packer: 2.29 bblWeight set on Packer: 2.29 bblBoll Collar: Weight set on Packer: 2.29 bblWeight set on Packer: 	Great States Manual	3	ATTN: J	lustin Carter			Test Start: 2019.01.25 @	04:19:00
Thin Pipe:         Length:         350.00 ft         Diameter:         2.76 inches Volume:         2.29 bbl         Weight set on Packer: 2000.00 lb           Yell Collar:         Length:         0.00 ft         Diameter:         0.00 inches Volume:         0.00 bbl         Weight set on Packer: 2000.00 lb           Drill Collar:         Length:         0.00 ft         Diameter:         0.00 inches Volume:         0.00 bbl         Weight set on Packer: 2000.00 lb           Drill Fipe Above KB:         18.00 ft         Total Volume:         51.40 bbl         Tool Chased         0.00 ft           Depth to Top Packer:         3823.00 ft         Total Volume:         51.40 bbl         Tool Chased         0.00 ft           Depth to Bottom Packer:         ft         ft         Final         58000.00 lb         Final         58000.00 lb           Depth to Bottom Packer:         35.00 ft         String Weight: Initial         58000.00 lb         Final         58000.00 lb           Shut In Tool         5.00         3798.00         3798.00         3808.00         3808.00           Jars         5.00         3813.00         30.00         Bottom Of Top Packer           Shut In Tool         5.00         \$813.00         30.00         Bottom Of Top Packer           Packer         5	ool Information			·				
Betry WriteLength0.00 ftDiameter:0.00 inches Volume:0.00 bblWeight to Pull Loose:68000.00 lbDrill Rolar18.00 ftTotal Volume:51.40 bblTotal Volume:51.40 bblTotal Chased0.00 ftDrill Pipe Above KB:18.00 ft18.00 ftTotal Volume:51.40 bblTotal Chased0.00 ftDepth to Top Packer:18.00 ft18.00 ft51.40 bblString Weight:Initial58000.00 lbDepth to Bottom Packer:ftft51.40 bblFinal58000.00 lbFinalSout Length:35.00 ft35.00 ftFinal58000.00 lbFinalFool DescriptionLength (ft)Serial No.PositionDepth (ft)Accum. LengthsShut In Tool5.003803.003803.00Jars5.003808.00Safety Joint5.00Salta.003813.0030.00Bottom Of Top PacPacker5.00Fluid3823.00Anchor0.003823.00Recorder0.009119Inside3823.00Storm Packers & AnclBullnose5.003818.003823.00Storm Packers & Ancl	rill Pipe: Length: 350	1.00 ft	Diameter:					
Total Volume:       51.40 bbl       Total Volume:       51.40 bbl       Total Volume:       51.40 bbl         Drill Pipe Above KB:       18.00 ft       3803.00 ft       String Weight:       Initial       58000.00 lb         Depth to Top Packer:       3823.00 ft       Final       58000.00 lb       Final       58000.00 lb         Depth to Bottom Packer:       ft       ft       ft       ft       ft       ft         Total Volume:       5.00 ft       String Weight:       Initial       58000.00 lb       ft         Tool Length:       35.00 ft       String Weight:       Initial       58000.00 lb       ft         Number of Packers:       2       Diameter:       6.75 inches       ft       ft         Tool Description       Length (ft)       Serial No.       Position       Depth (ft)       Accum. Lengths         Shut In Tool       5.00       3803.00       3803.00       Jt       Jt         Jars       5.00       3813.00       30.00       Bottom Of Top Packer         Safety Joint       5.00       Salta.00       30.00       Bottom Of Top Packer         Packer       5.00       Fluid       3823.00       Accum. Lengths         Recorder       0.00       9119								
brill Pipe Above KB: 18.00 ft Depth to Top Packer: 3823.00 ft Depth to Top Packer: 3823.00 ft Total volume. 51.40 bis String Weight: Initial 58000.00 lb Final 5	orill Collar: Length:	0.00 ft	Diameter:	-				
Depth to Top Packer:3823.00 ft therval betw een Packers:Final58000.00 lbDepth to Bottom Packer:ft therval betw een Packers:5.00 ft tool Length:35.00 ftYumber of Packers:2Diameter:6.75 inchesFool Ocomments:2Diameter:6.75 inchesFinal 58000.00 lbShut In Tool5.0020pth (ft)Accum. LengthsShut In Tool5.003798.00Hydraulic tool5.003803.00Jars5.003808.00Safety Joint5.003813.00Packer5.003818.00Packer5.00FluidPacker5.0019 legas.00Anchor0.009119Nachor0.0091716Outside3823.00Becorder0.0091716Bullnose5.003828.00South Safe South5.00South Safe South3823.00Stater South3.00Stater Sout	rill Pine Above KB: 1	8.00 ft			Total Volume:	51.40 bbl		
Depth to Bottom Packer:ftInterval between Packers:5.00 ftSolution35.00 ftNumber of Packers:2Diameter:6.75 inchesFool DescriptionLength (ft)Serial No.PositionDepth (ft)Accum. LengthsFool Description5.00Shut In Tool5.005.003803.00Hydraulic tool5.00Safety Joint5.00Safety Joint5.00Packer5.00Packer5.00Packer5.00Safety Joint5.00Packer5.00Safety Joint5.00Packer5.00Packer5.00Packer5.00Packer5.00Safety Joint5.00Safety Joint5.00Safety Joint5.00Safety Joint5.00Safety Joint5.00Safety Joint5.00Safety Joint5.00Safety Joint5.00Ballionse5.00Safety Joint5.00Safety Joint5.00Ballionse5.00Safety Joint5.00Safety Joint5.00Safety Jo								
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Shut In Tool         5.00         3798.00           -lydraulic tool         5.00         3803.00           Jars         5.00         3808.00           Safety Joint         5.00         3813.00           Packer         5.00         3818.00           Packer         5.00         3813.00           Packer         5.00         3813.00           Packer         5.00         3818.00           Packer         5.00         Fluid           Packer         5.00         823.00           Recorder         0.00         9119           Inside         3823.00           Bullnose         5.00         3828.00	ool Comments:							
Shut In Tool         5.00         3798.00           Hydraulic tool         5.00         3803.00           Jars         5.00         3808.00           Safety Joint         5.00         3813.00           Packer         5.00         Sate 33.00           Packer         5.00         Fluid         3823.00           Anchor         0.00         9119         Inside         3823.00           Recorder         0.00         91716         Outside         3823.00           Bullnose         5.00         3828.00         5.00         Bottom Packers & Ancle								
Hydraulic tool     5.00     3803.00       Jars     5.00     3808.00       Safety Joint     5.00     3813.00       Packer     5.00     3818.00       Packer     5.00     Fluid       Packer     5.00     Fluid       Packer     0.00     9119       Inside     3823.00       Recorder     0.00     9119       Bullnose     5.00     3828.00	Tool Description	Le	• • • •	Serial No.	Position		Accum. Lengths	
Jars         5.00         3808.00           Safety Joint         5.00         3813.00           Packer         5.00         3818.00         30.00         Bottom Of Top Pac           Packer         5.00         Fluid         3823.00         3823.00           Anchor         0.00         9119         Inside         3823.00           Recorder         0.00         91716         Outside         3823.00           Bullnose         5.00         3828.00         5.00         Bottom Packers & Ancle	Shut In Tool							
Safety Joint         5.00         3813.00           Packer         5.00         3818.00         30.00         Bottom Of Top Pac           Packer         5.00         Fluid         3823.00         Bottom Of Top Pac           Packer         0.00         3823.00         3823.00         Seconder         0.00         9119         Inside         3823.00         Seconder         Seconder <td>Hydraulic tool</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Hydraulic tool							
Packer         5.00         3818.00         30.00         Bottom Of Top Pac           Packer         5.00         Fluid         3823.00           Anchor         0.00         3823.00           Recorder         0.00         9119           Inside         3823.00           Becorder         0.00         91716           Outside         3823.00           Bullnose         5.00         Stop	lars		5.00					
Packer         5.00         Fluid         3823.00           Packer         5.00         Secondar         Secondar           Anchor         0.00         3823.00         Secondar           Recorder         0.00         9119         Inside         3823.00           Recorder         0.00         91716         Outside         3823.00           Bullnose         5.00         3828.00         5.00         Bottom Packers & Ancle	Safety Joint		5.00					
Anchor         0.00         3823.00           Recorder         0.00         9119         Inside         3823.00           Recorder         0.00         91716         Outside         3823.00           Bullnose         5.00         5.00         5.00         Bottom Packers & Ancle	Packer		5.00				30.00	Bottom Of Top Packe
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Recorder0.0091716Outside3823.00Bullnose5.003828.005.00Bottom Packers & Ancl	donor		0.00					
Bullnose 5.00 3828.00 5.00 Bottom Packers & Ancl					Incida	2022 00		
Bullnose 5.00 OSES.00 COST	Anchor		0.00	9119				
Total Tool Length: 35.00	Anchor Recorder							
	Anchor Recorder Recorder		0.00			3823.00	5.00 Bo	ottom Packers & Ancho
	Anchor Recorder Recorder Bullnose	ngth:	0.00 5.00			3823.00	5.00 Bo	ottom Packers & Ancho
	Anchor Recorder Recorder Bullnose	ngth:	0.00 5.00			3823.00	5.00 Bo	ottom Packers & Anch
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			16-22s-13w Staffor	rd
ZToeto				
	1801 8020	Broadw ay Suite 200 Denver ,Colorado	M&N-Gates #1-16	DST#:5
Grand Bands Ka	1203		Job Ticket: 01076	
	ATTN	N: Justin Carter	Test Start: 2019.01.25	@ 04:19:00
ud and Cushion Info	ormation			
ud Type: Gel Chem		Cushion Type:	Oil API:	deg API
ud Weight: 9.00 lb		Cushion Length:	ft Water Sa	linity: ppm
scosity: 58.00 s		Cushion Volume: Gas Cushion Type:	bbl	
Vater Loss: 11.20 in esistivity: 0	hm.m	Gas Cushion Pressure:	psig	
alinity: 13200.00 p	opm			
Iter Cake: 1.00 in ecovery Information				
ecovery mormation		Recovery Table		
	Length ft	Description	Volume bbl	
	420.00	Clean Gassy Oil 290% Gas 80 %Oil	3.837	
	30.00			
Tot	tal Length: 4	50.00 ft Total Volume: 4.258		
	m Fluid Samples: 0	Num Gas Bombs: 0	Serial #:	
	boratory Name: covery Comments:	Laboratory Location:		

Ref. No: 01076



Ref. No: 01076

