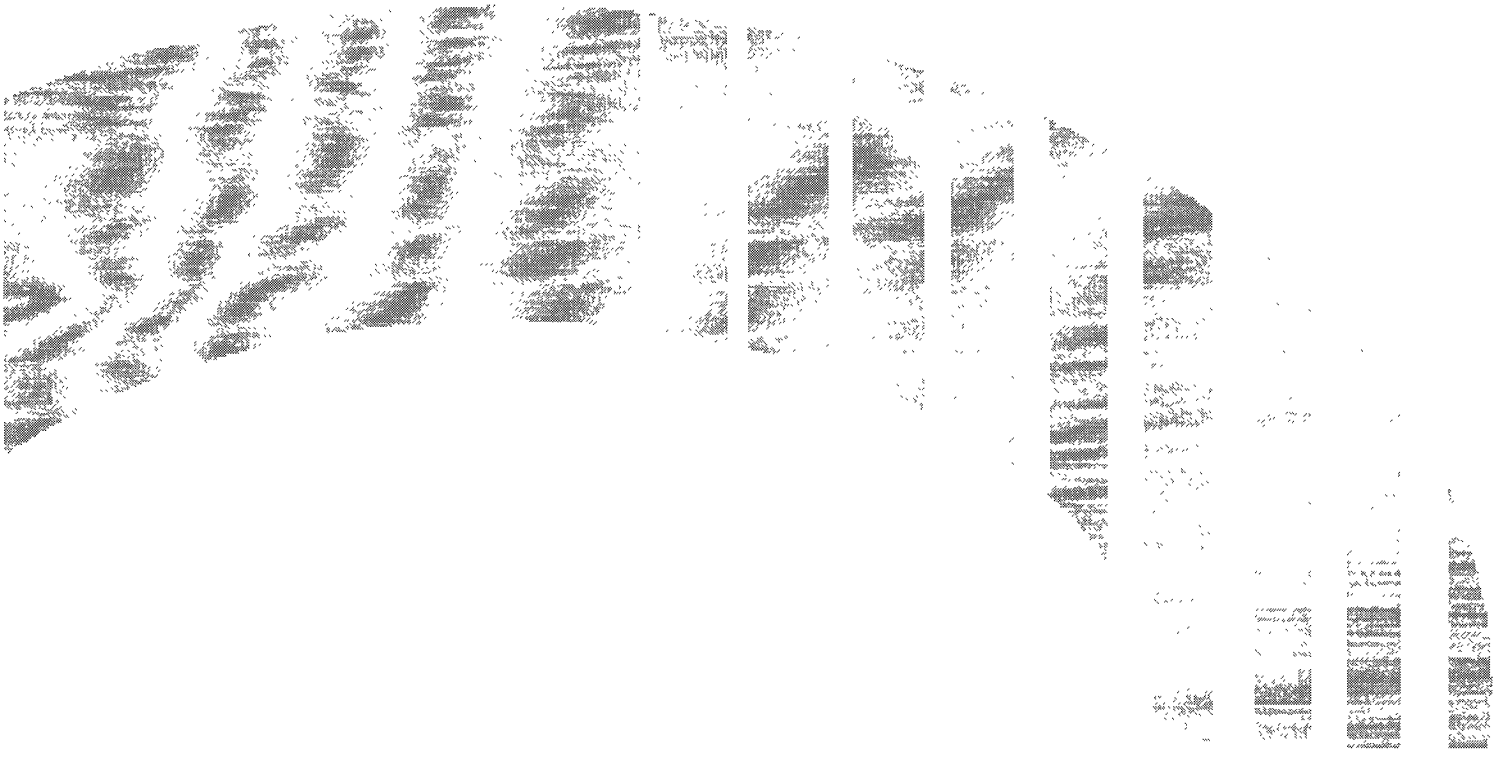
Techwell Surveys Corp.

Production Profile Interpretation Report

Company:	Cimarex Energy Company
Field:	White City
Well:	Gadwall 18 Fed. Com #1
Survey Date:	12-16-2011
Service Company:	Techwell Surveys Corporation
Interpretation Date:	12-22-2011
Analyst:	JD Taylor
	Survey #1



Techwell Survey Corporation	Job Information	Gadwall_18-1
	Company: Cimarex Energy Company Field: White City Well: Gadwall 18 Fed. Com #1	Test: Flowing 48/64 Choke Date: 12-16-2011 Survey: Survey # 1

Survey date	12-16-2011	Interpretation date	12/22/2011
Service company	Techwell Surveys Corporation	Done by	JD Taylor
SURVEY	Survey # 1		
Surface rates		Gas	702 Mscf/D
Oil	53 STB/D	Water	154 STB/D
TOOLS			
String O.D.	1.375 in	Capacitance	
Spinner blade O.D.	3. in	Calib. type	Yw vs norm. resp.
Density	Corrected	Default chart	CWH Water-Hydrocarbon
		100% Water	9985 cps
		100% HC	19865 cps
INTERPRETATION	Interpretation # 1		
Density offset	0 g/cc		
Capacitance offset	0 cps		
Flow type	3-Phase L-G		
Flow model L-G	Dukler		
Flow model W-O	ABB - Deviated		
Vpcf mult.	1		
Vslip mult.	1		
Vslip mult.W-O	1		

Comments

Well logged flowing to sales on a 48/64 choke with 968 Psia Ftp, line pressure at 963 psi. Recorded multiple passes in both directions to obtain flow profile. Liquid fall back was observed to 9235 (pass #1) after decending down tubing string. Bottom hole pressure fluctuated during survey from 2512 psia to 2610 psia. Major production from the Wolfcamp, minor from Cisco Canyon. Depth corrected to Halliburton CBL dated 07-28-05.

Gadwall 18 Fed. Com. #1 API # 30-015-33496
880' FNL & 1490' FWL od Sec. 18, T25S, R27E
Eddy Co., New Mexico

JD Taylor
Techwell Surveys Corporation
432-664-4978.

Techwell Surveys Corporation

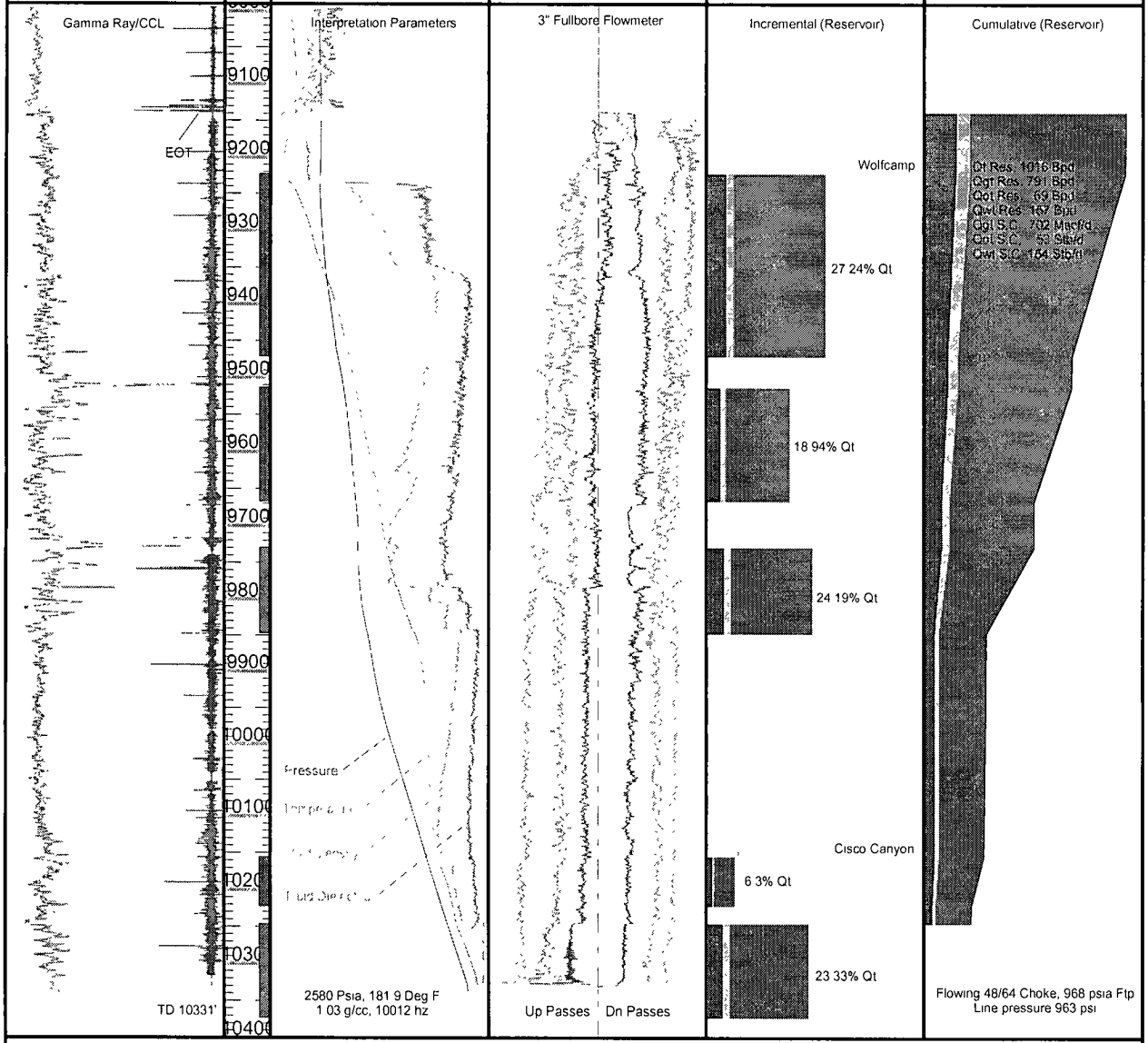
Production Profile

Gadwall_18-1

Company: Cimarex Energy Company
Field: White City
Well: Gadwall 18 Fed. Com #1

Test: Flowing 48/64 Choke
Date: 12-16-2011
Survey: Survey # 1

Gamma Ray/CCL	Depth (ft)	Interpretation # 1	Flowmeter	Rates	Rates
GR S1,U40		TEMP S1,I1	CFLOW (rps)	Rates (QZI) (B/D)	Rates (QZT) (B/D)
0 GAPI 360		100 °F 183	-8 8	0 500	0 1100
GR S1,D40		PRESS S1,I1			
0 GAPI 300		2120 psia 2630			
CCL S1,D40		GRAD S1,I1			
35000. 50000.		0.900 1.1			
		CWH S1,I1			
		10865 cps 9800			



Techwell Surveys Corporation

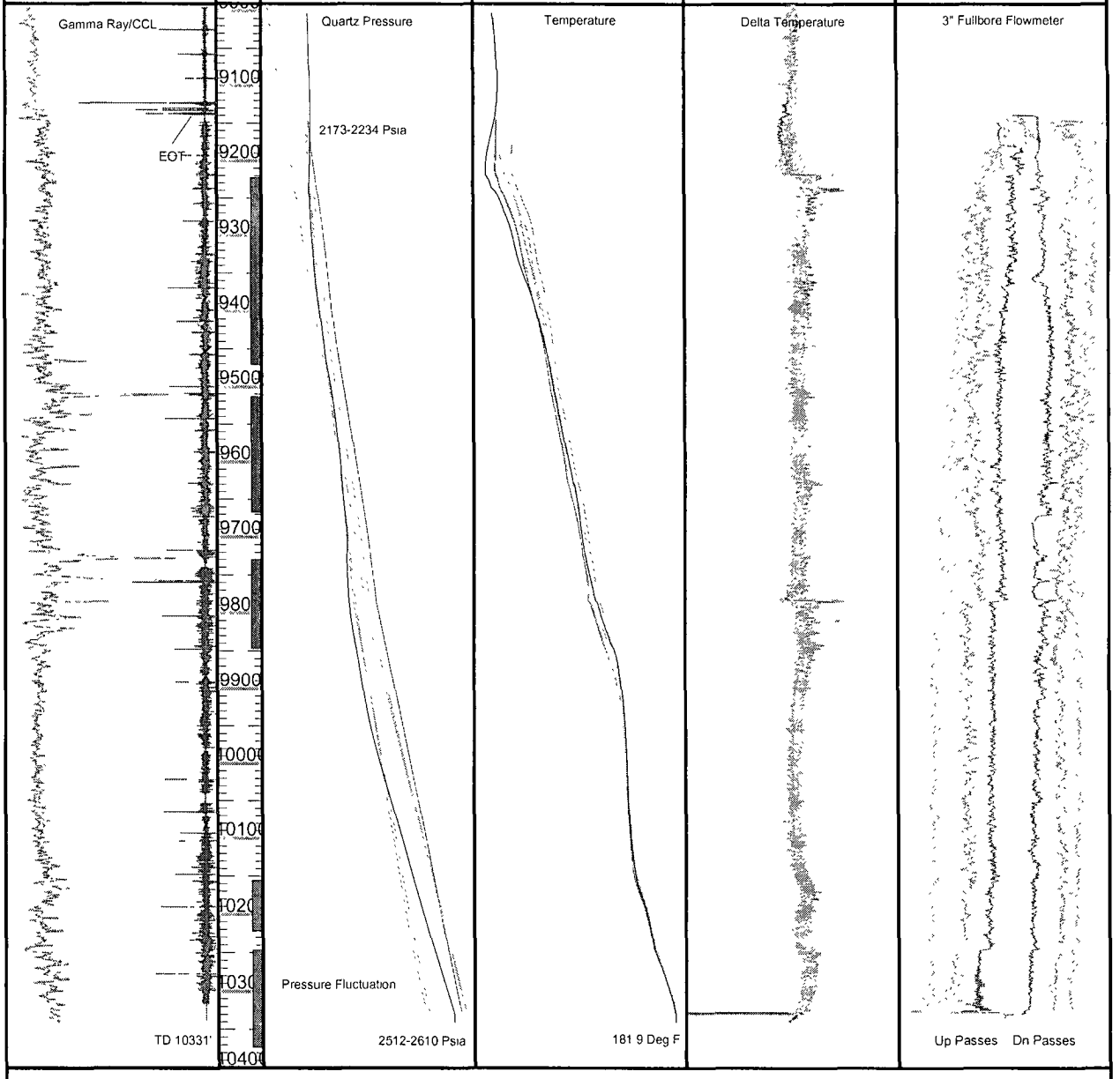
Pressure-Temp-FM

Gadwall_18-1

Company: Cimarex Energy Company
Field: White City
Well: Gadwall 18 Fed. Com #1

Test: Flowing 48/64 Choke
Date: 12-16-2011
Survey: Survey # 1

Gamma Ray/CCL	Depth (ft)	Pressure	Temperature	Temperature	Flowmeter
GR S1,U40		PRESS (psia)	TEMP (°F)	DTEMP (°F)	CFLOW (rps)
0 GAPI 360		2120 2630	160 183	-0.2 0.2	-8 8
GR S1,D40					
0 GAPI 360					
CCL S1,D40					
35000 50000.					



Techwell Surveys Corporation

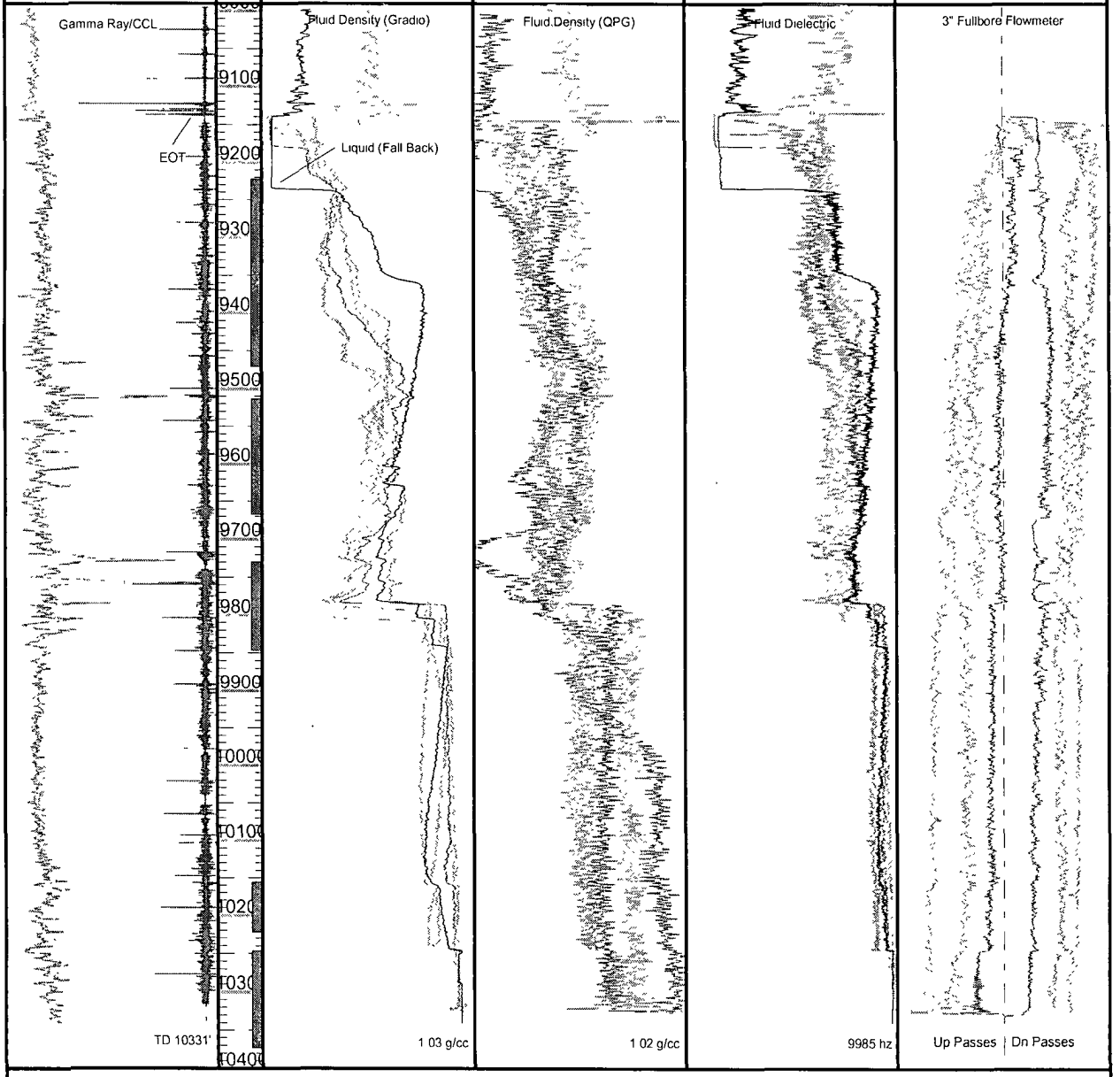
Fluid Density-Dielectric-FM

Gadwall_18-1

Company: Cimarex Energy Company
Field: White City
Well: Gadwall 18 Fed. Com #1

Test: Flowing 48/64 Choke
Date: 12-16-2011
Survey: Survey # 1

Gamma Ray/CCL	Depth (ft)	Density GRAD (g/cc)	Density PRESSSG (g/cc)	Capacitance CWH (cps)	Flowmeter CFLOW (rps)
GR S1,U40		0 1.1	0 1.4	19865 9800	-8 8
0 GAPI 360					
GR S1,D40					
0 GAPI 360					
CCL S1,D40					
35000 50000.					



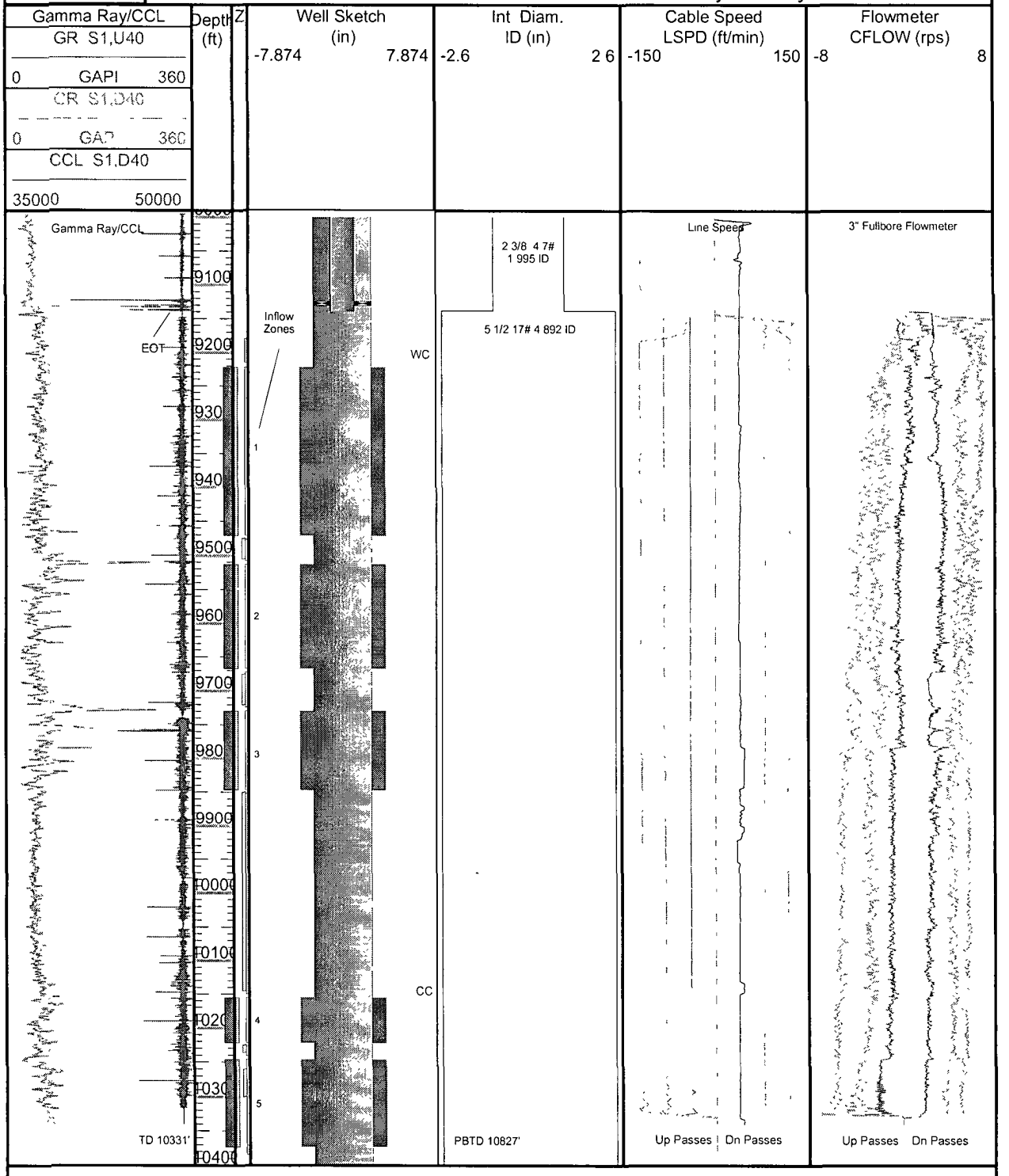
Techwell Surveys Corporation

Well Sketch-ID-LS-FM

Gadwall_18-1

Company: Cimarex Energy Company
Field: White City
Well: Gadwall 18 Fed. Com #1

Test: Flowing 48/64 Choke
Date: 12-16-2011
Survey: Survey # 1



Zones ft	Water STB/D	Oil STB/D	Gas Mscf/D
9222.0-9471.0	41.78	14.34	187.80
9513.0-9667.0	29.06	10.05	130.43
9729.0-9847.0	37.35	12.87	167.68
10155.0-10222.0	11.00	3.61	43.29
10246.0-10373.0	34.87	12.14	172.94
Total	154.06	53.02	702.14

Zones ft	Qt res. B/D	Production %
9222.0-9471.0	272.40	27.24
9513.0-9667.0	189.33	18.94
9729.0-9847.0	241.87	24.19
10155.0-10222.0	62.94	6.30
10246.0-10373.0	233.30	23.33

Contributions by phase

Zones ft	Qw res. B/D	Qo res. B/D	Qg res. B/D	W O G
9222.0-9471.0	42.45	18.56	211.40	
9513.0-9667.0	29.58	13.04	146.71	
9729.0-9847.0	38.06	16.73	187.07	
10155.0-10222.0	11.22	4.70	47.02	
10246.0-10373.0	35.60	15.80	181.90	

Zone ft	Corr. factor	Vm ft/min	Q downhole B/D	Contribution %
9222.0-9471.0	0.87	30.346	1015.90	27.24
9513.0-9667.0	0.86	22.215	743.70	18.94
9729.0-9847.0	0.86	16.456	550.90	24.19
10155.0-10222.0	0.85	9.072	303.70	6.30
10246.0-10373.0	0.85	6.969	233.30	23.33

Total rates by phase

Zone ft	Qw res. B/D	Qw s.c. STB/D	Qo res. B/D	Qo s.c. STB/D	Qg res. B/D	Qg s.c. Mscf/D
9222.0-9471.0	156.50	154.06	68.60	53.02	790.80	702.14
9513.0-9667.0	114.30	112.28	50.20	38.67	579.20	514.34
9729.0-9847.0	84.80	83.22	37.20	28.62	428.90	383.91
10155.0-10222.0	46.80	45.87	20.50	15.75	236.40	216.24
10246.0-10373.0	35.60	34.87	15.80	12.14	181.90	172.94

#	From-To ft	ID in	Deviation °	Rt	T °F	P psia
1	9180.0-9215.0	4.8900	0.0000	3.679E-4	161.0000	2234.1000
2	9476.0-9508.0	4.8900	0.0000	3.679E-4	169.0000	2281.6000
3	9672.0-9724.0	4.8900	0.0000	3.679E-4	172.0000	2321.5000
4	9852.0-10150.0	4.8900	0.0000	3.679E-4	177.0000	2406.8000

#	Bw	Muw cp	Rhow g/cc	Bo	Muo cp	Rhoo g/cc	Bg	Mug cp	Rhog g/cc
1	1.0159	0.4385	1.0000	1.2940	0.3605	0.6600	0.0066	0.0175	0.1300
2	1.0180	0.4132	1.0000	1.2981	0.3476	0.6600	0.0066	0.0177	0.1300
3	1.0190	0.4026	1.0000	1.2996	0.3431	0.6600	0.0066	0.0178	0.1300
4	1.0204	0.3876	1.0000	1.3016	0.3377	0.6600	0.0064	0.0181	0.1300

#	Correl.	Correl. W-O	Regime	Slip ft/min	Slip W-O ft/min
1	Dukler	ABB - Deviated	Slug liquid-gas	48.174	21.179
2	Dukler	ABB - Deviated	Slug liquid-gas	48.150	21.200
3	Dukler	ABB - Deviated	Bubble	58.705	21.206
4	Dukler	ABB - Deviated	Bubble	59.578	21.210

#	Yw	Yo	Yg	Vw ft/min	Vo ft/min	Vg ft/min
1	0.5500	0.0470	0.4000	8.4200	43.6000	59.3000
2	0.6500	0.0415	0.3100	5.2900	36.1000	55.3000
3	0.7600	0.0371	0.2000	3.3300	29.9000	63.3000
4	0.8600	0.0240	0.1100	1.6200	25.6000	61.8000

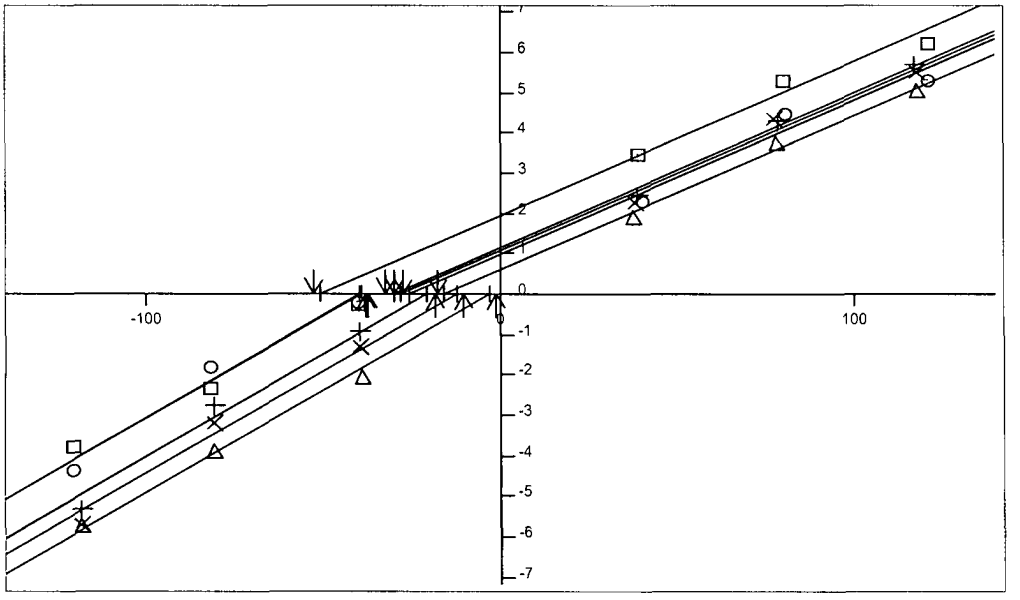
#	From-To ft	ID in	Deviation °	Rt	T °F	P psia
5	10227.0-10241.0	4.8900	0.0000	3.679E-4	179.0000	2526.2000
6	10375.0-10380.0	4.8900	0.0000	3.679E-4	N/A	N/A

#	Bw	Muw cp	Rhow g/cc	Bo	Muo cp	Rhoo g/cc	Bg	Mug cp	Rhog g/cc
5	1.0210	0.3791	1.0000	1.3018	0.3378	0.6600	0.0062	0.0185	0.1400
6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

#	Correl.	Correl. W-O	Regime	Slip ft/min	Slip W-O ft/min
5	Dukler	ABB - Deviated	Bubble	59.739	21.202
6	Dukler	ABB - Deviated		N/A	N/A

#	Yw	Yo	Yg	Vw ft/min	Vo ft/min	Vg ft/min
5	0.8900	0.0193	0.0885	1.1900	24.5000	61.4000
6	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000

FLUID TYPE	Water - Oil+Gas
GAS	
Specific gravity	0.68
N2 %	0
CO2 %	0
H2S %	0
Z	Beggs and Brill
Mug	Lee et al.
OIL	
Gravity	0.77 sp. gr.
GOR	561.458 cf/bbl
Pb	Standing
Rs	Standing
Bo	Standing
co	Vasquez and Beggs
Muo	Beggs and Robinson
WATER	
Salinity, ppm	21000
Rsw	Katz
cw	Dodson and Standing
Muw	Van-Wingen+Frick



rps versus ft/min

Threshold (+) 2 ft/min

Threshold (-) -2 ft/min

	Calib. Zone ft	Slope (+)	Slope (-)	Int (+) ft/min	Int (-) ft/min	Int. Diff. ft/min
□	9475.0-9505.0	0.038	0.051	-50.99	-39.35	-11.63
○	9675.0-9720.0	0.038	0.051	-25.77	-40.09	14.32
+	9850.0-10145.0	0.038	0.051	-30.34	-20.75	-9.60
×	10225.0-10236.0	0.038	0.051	-28.21	-12.55	-15.66
△	10260.0-10300.0	0.038	0.051	-16.11	-3.01	-13.09

30-015-33461

Sharp, Karen, EMNRD

Subject: FW: Marquardt 12 Penn Federal #1 and Gadwall 18 Federal #1
Attachments: Marquardt_12-1_PLA.pdf; Gadwall_18-1_PLA.pdf

From: Scott Gengler
Sent: Friday, December 30, 2011 4:57 PM
To: Genea Holloway; Carolyn Larson
Cc: Chad McGehee
Subject: Marquardt 12 Penn Federal #1 and Gadwall 18 Federal #1

Genea and Carolyn:

Attached are the production log analyses for the Marquardt 12 Penn Federal #1 and the Gadwall 18 Federal #1. The production splits are as follows:

Marquardt 12 Penn Federal #1

Wolfcamp – 86.5%
Cisco Canyon – 13.5%

Gadwall 18 Federal #1

Wolfcamp – 70%
Cisco Canyon – 30%

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