



**Caza Oil & Gas, Inc.  
Forehand Ranch 27 #4  
Cherry Canyon Formation  
Eddy County, New Mexico**

**Post Stimulation Report**

**Project No.: 33884  
Job Date: August 30, 2014  
Report Date: September 4, 2014**

Ex. 1

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## **1. Executive Summary**

The Forehand Ranch 27 #4 was completed in the Cherry Canyon interval with perforations from 3,315 ft. to 3,337 ft.

Nabors Completion & Production Services performed the fracture stimulation treatment on August 30, 2014, and placed 211,000 pounds of 16/30 Ottawa Sand with 7,787 gallons of 20 lb. linear gel and 109,259 gallons of 20 lb. crosslinked borate fluids.

## 2. Discussion

Proposed Pump Schedule														
Customer Name				Stage 1 Zone Information				Tubular Type		Grade	OD	ID	BB/FT	Depth
Well Name				Perforation Depth				5 1/2" 25-500		J-55	5.500	4.950	0.0238	3.38
Formation Name				Displacement										
NCPIS Supervisor				Top Perf										
NCPIS Engineer				Mid Perf										
				Bottom Perf										

#	Description	#	Fluid Type	Clean Volume gal	Blender Concentration		Rate (gpm)		Time	Slurry Volume (bbl)		Clean Volume (bbl)		#	Sand Type	Sand Volume
					Start	End	Slurry	Clean	min	Stage	Cumulative	Stage	Cumulative			Carriers
1	Establish XL	1	20# Linear	2,000			50.0	50.0	0:00:57	47.6	47.6	47.6	47.6			0
2	Pad	2	20# BGL	33,600			50.0	50.0	0:16:00	800.0	847.6	800.0	847.6			0
3	0.50# 16/30 Jordan-Underin	2	20# BGL	10,000	0.50	0.50	50.0	48.9	0:04:52	243.5	1091.1	238.1	1085.7	1	Ottawa 16/30	5,000
4	1.00# 16/30 Jordan-Underin	2	20# BGL	12,000	1.00	1.00	50.0	47.8	0:05:58	286.7	1385.9	285.7	1371.4	1	Ottawa 16/30	12,000
5	2.00# 16/30 Jordan-Underin	2	20# BGL	14,000	2.00	2.00	50.0	45.8	0:07:16	363.7	1753.6	333.3	1704.8	1	Ottawa 16/30	28,000
6	3.00# 16/30 Jordan-Underin	2	20# BGL	15,000	3.00	3.00	50.0	44.0	0:08:07	406.0	2159.9	387.3	2061.9	1	Ottawa 16/30	45,000
7	4.00# 16/30 Jordan-Underin	2	20# BGL	15,000	4.00	4.00	50.0	42.3	0:08:57	422.3	2583.9	397.3	2418.0	1	Ottawa 16/30	60,000
8	6.00# 16/30 Jordan-Underin	2	20# BGL	10,000	6.00	6.00	50.0	39.3	0:06:04	303.2	2885.1	238.1	2687.1	1	Ottawa 16/30	80,000
9	Flush	1	20# Linear	3,365			60.0	60.0	0:01:18	77.7	2962.9	77.7	2794.9			0
																210,000
Total Pump Time				0:59:00		Total Fluids		2962.9		2794.9		Total Sand		210,000		

Table 1 Cherry Canyon Design Treatment Schedule from Nabors

Table 1 Highlights the treatment schedule for the Cherry Canyon fracture stimulation. The design schedule places 210,000 pounds of 16/30 Ottawa Sand proppant with 109,600 gallons of 20 lb. borate crosslinked fluid.

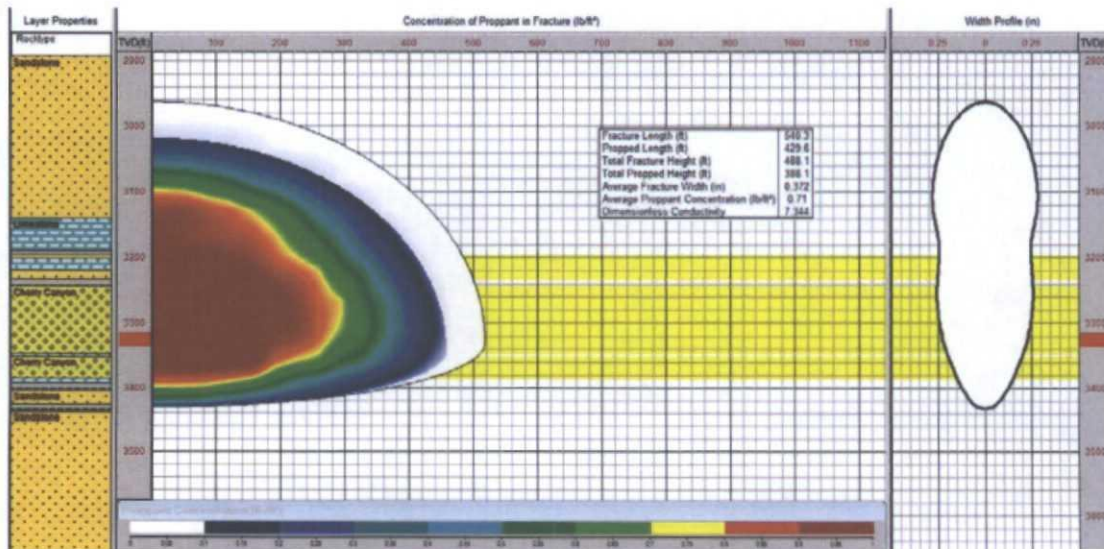


Figure 1 Cherry Canyon Design Geometry

Figure 1 shows the fracture geometry properties for the design treatment:

Propped Fracture Length	430 ft.
Propped Fracture Height	388 ft.
Average Fracture Width	0.372 in.
Average Proppant Concentration	0.71 lbs./ft. <sup>2</sup>
Dimensionless Conductivity	7.34

### 3. Summary of Results

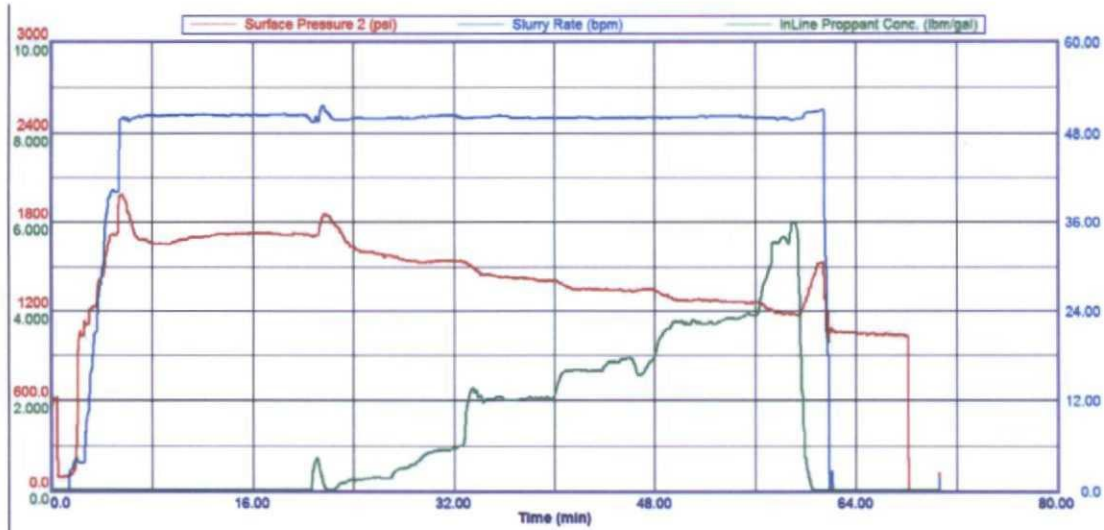



Figure 2 Treatment Parameters from the Cherry Canyon fracture stimulation.

Figure 2 shows the injection rate, surface treating pressure, and proppant concentration for the fracture treatment. The treatment was pumped to completion without issue.

Stimulation Treatment Report

Customer Name	Casa Petroleum
Well Name	Forehand 27 State 84-1
Customer Rep	Rex Headrick
NCPIS Supervisor	Michael Wilson
NCPIS Engineer	Nathan Hancock

Stage 1	
Date	8/29/2014
Requested Start Time	Finish Rig Up
Actual Start Time	8:51 PM
End Time	9:54 PM



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Description	Time	Ave Pressure psi	Slurry Rate bpm	Clean Stage bbls	Clean Total bbls	Slurry Total bbls	#	Fluid System	Prop Conc. ppg	Prop Stage lbs	#	Proppant Type
Open Well Pressure	8:51 PM	47										
Breakdown	8:52 PM	1,001	3.8	105	105	105	1	20# Linear				
Pad	8:56 PM	1,820	50.2	835	940	943	2	20# BXL				
0.50# 16/30 White	9:13 PM	1,648	50.3	237	1177	1184	2	20# BXL	0.50	6,340	1	Ottawa 16/30
1.00# 16/30 White	9:17 PM	1,514	49.9	291	1468	1438	2	20# BXL	1.00	12,290	1	Ottawa 16/30
2.00# 16/30 White	9:23 PM	1,469	50.1	335	1803	1854	2	20# BXL	2.00	28,140	1	Ottawa 16/30
3.00# 16/30 White	9:31 PM	1,335	50.0	359	2162	2266	2	20# BXL	3.00	45,380	1	Ottawa 16/30
4.00# 16/30 White	9:39 PM	1,272	50.1	357	2520	2694	2	20# BXL	4.00	60,110	1	Ottawa 16/30
6.00# 16/30 White	9:48 PM	1,179	50.1	187	2706	2925	2	20# BXL	6.00	58,740	1	Ottawa 16/30
Flush	9:52 PM	1,245	50.8	81	2787	3006	1	20# Linear				
Shutdown	9:54 PM	995										

Table 2 Treatment Report from Nabors

Table 2 itemizes the steps occurring during the stimulation treatment.

Job Summary			
Pressure, Rate and Other Information			
Max Pressure	1,922	psi	
Avg Pressure	1,432	psi	
Max Rate	52.4	bpm	
Avg Rate	50.1	bpm	
Open Well Pressure	47	psi	
Break Pressure	1,001	psi	
Break Rate	3.8	bpm	
Target Rate	60.0	bpm	
FET and ISIP Information			
FET/Initial ISIP		Final ISIP	
Time	Pressure	Time	Pressure
Initial	-	Initial	995
5 Min	-	5 Min	959
10 Min	-	10 Min	-
15 Min	-	15 Min	-
Total Fluid Volumes			
Clean	2,787	Slurry	3,006
Fluid System Usage			
System Name	bbbls	gals	
20# Linear	185	7,787	
20# BXL	2601	109,259	
Calculated Proppant Usage			
Proppant Type	lbs		
Ottawa 16/30	211,000		
Calculated Chemical Usage			
Chemical Name	gals		
LSG-100	585		
XL-11	142		
EXP-40416-14	117		
Clay Treat LT	117		
OB Breaker	117		
EL-20L	12		
KR 153 SL	23		
Super TSC LTS	23		
Super Green Solve	0		

Table 3 Treatment Summary from Nabors

Table 3 summarizes the main treatment parameters.

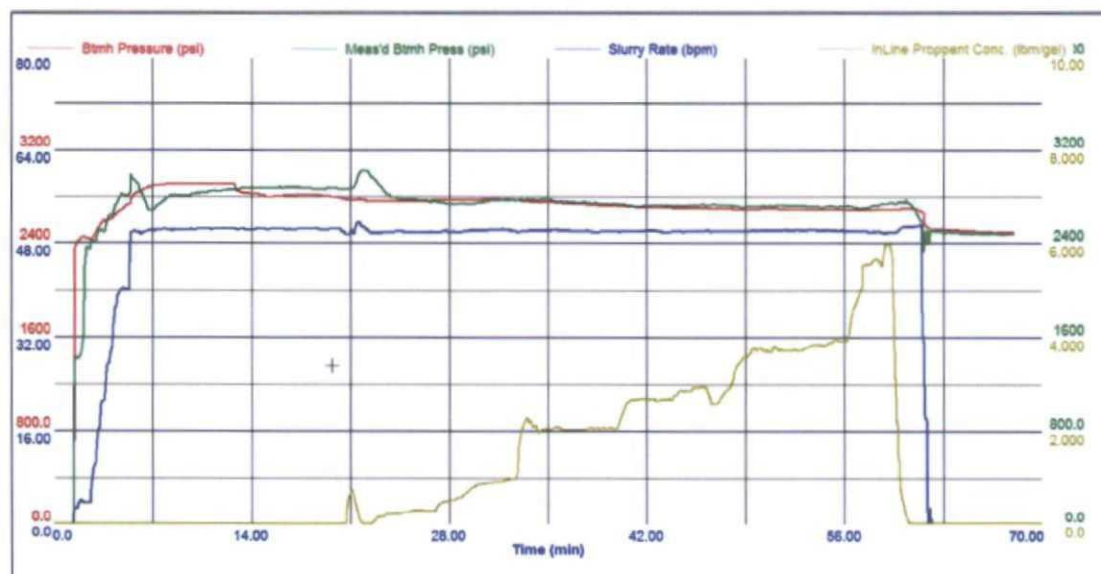


Figure 3 Pressure Match of Cherry Canyon treatment.

Figure 3 shows the results of altering layer stress, reservoir permeability, and proppant drag to match the model's calculated bottom-hole pressure to actual treatment bottom-hole pressure.

Highlights of Pressure Match:

Layer stresses were 7% lower than design values  
Pay Zone permeability was unchanged at 0.53 md.



The lack of a step rate test and an extended shut in period did not allow analysis of perforation and near-wellbore frictions.

The actual treatment pumped approximately 211,000 pounds of proppant compared to the initial design of 210,000 pounds.

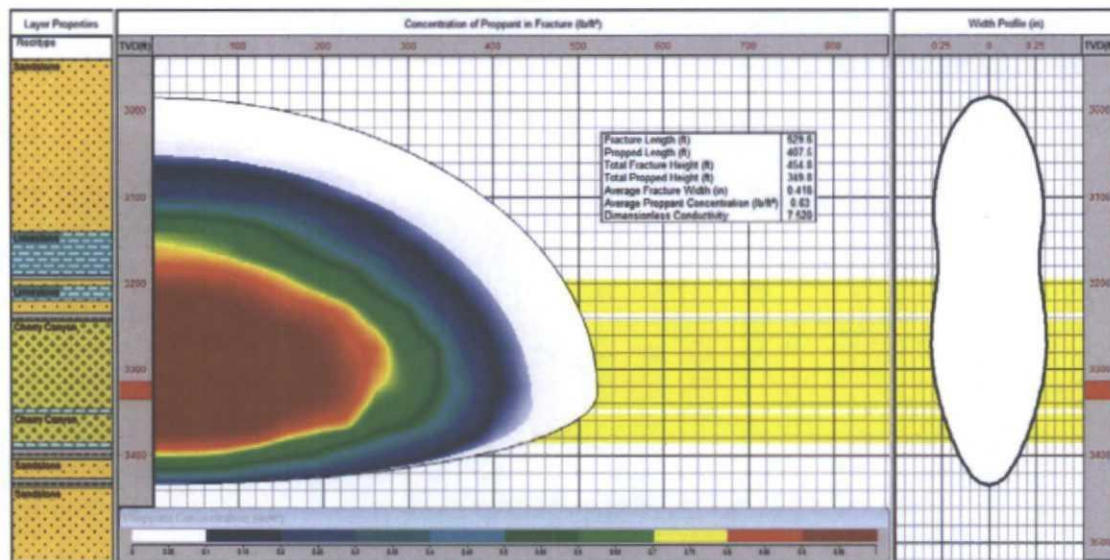


Figure 4 Cherry Canyon Pressure Match Geometry.

Figure 4 shows the fracture geometry properties for the design treatment:

Propped Fracture Length	408 ft.
Propped Fracture Height	350 ft.
Average Fracture Width	0.416 in.
Average Proppant Concentration	0.64 lbs./ft. <sup>2</sup>
Dimensionless Conductivity	7.52

Geometry Parameter	Design	Match	Variance (%)
Propped Length (ft.)	430	408	-5
Propped Height (ft.)	388	350	-10
Avg. Width (in.)	0.372	0.416	+12
Avg. Prop. Conc. (lbs./ft. <sup>2</sup> )	0.71	0.64	-10
Dimensionless Conductivity	7.34	7.52	+2.5

Table 4 Comparison of Design and Pressure Match Fracture Geometry Parameters.